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| **Telecommunication Standardization Bureau** |  |
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Geneva, 11 June 2013

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| Ref: | **TSB Circular 35** COM 17/MEU |
|  |  |
| Tel: | +41 22 730 5866 |
| Fax: | +41 22 730 5853 |
| E-mail: | [tsbsg17@itu.int](mailto:tsbsg17@itu.int) |
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| - To Administrations of Member States  of the Union  **Copy:**  - To ITU-T Sector Members;  - To ITU-T Associates;  - To ITU-T Academia;  To the Chairman and Vice-Chairmen  of Study Group 17;  - To the Director of the Telecommunication Development Bureau;  - To the Director of the Radiocommunication Bureau |

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| Subject | **Approval of revised Questions 8/17 and 12/17** |

Dear Sir/Madam,

1 At the request of the Chairman of Study Group 17, *Security*, I have the honour to inform you that, in accordance with the procedure described in Resolution 1, Section 7, § 7.2.2, of WTSA (Dubai, 2012), Member States and Sector Members present at the last meeting of this Study Group which was held in Geneva from 17 to 26 April 2013, agreed by reaching consensus to approve the following revised Questions:

*Question 8/17, Cloud computing security* (see Annex 1)

*Question 12/17, Formal languages for telecommunication software and testing* (see Annex 2).

2 **Questions 8/17 and 12/17 are therefore approved.**

3 The resulting Recommendations in Q8/17 are assumed to fall under the Traditional approval process (TAP).

4 The resulting Recommendations in Q12/17 are assumed to fall under the Alternative approval process (AAP).

Yours faithfully,

Malcolm Johnson  
Director of the Telecommunication  
Standardization Bureau

**Annexes: 2**

ANNEX 1  
(to TSB Circular 35)

Text of revised Question 8/17

Cloud computing security

(Continuation of Q8/17)

### 1 Motivation

Cloud computing is a model for enabling service user’s ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services), that can be rapidly provisioned and released with minimal management effort or service provider interaction. The cloud computing model is defined by five essential characteristics (on-demand, delivery over a broad network access, resource pooling, rapid elasticity, self and measured services), five cloud computing service categories, i.e., Software as a Service (SaaS), Communication as a Service (CaaS), Platform as a Service (PaaS), Infrastructure as a Service (IaaS) and Network as a Service (NaaS), and different deployment models (public, private, hybrid…). The advent of the cloud computing approach as the preferred vehicle for discovering, externalizing, composing, service re-use within workflows, applications, communication enabled applications places new emphasis on the need for security.

Forecasted benefits of cloud computing include flexible and dynamic resource provisioning, and simpler and automated administration of IT infrastructure. Virtualization makes possible to share of nearly unlimited resources, with scalability improvements and massive cost reductions for infrastructure management. However, open systems and shared resources of cloud computing raise many concerns about security, which is perhaps the most important barrier to the adoption of cloud computing. Moving to the cloud implies to shifting from safe, traditional, in-house IT systems to unsafe, “cloudified”, open infrastructures. It thus requires in-depth rethinking of security.

Cloud computing was considered for several years as service-centric IT and controlled by Internet players. However, telecommunication players have an important role to play in the emerging cloud computing market and ecosystem. As cloud services are delivered through telecommunication networks, telecommunication players should guarantee a high assurance level. Strong but flexible security protection will be a key enabler for the whole cloud market and eco-system.

In addition, the flexible use of rich resources in cloud computing environments will enable new security services that the current premise defences cannot provide (e.g. anti-malware services as a cloud service). Thus, there is need to examine what kind of security measures cloud computing can offer in the near future.

Draft Recommendations ITU‑T X.ccsec, X.srfcts and X.sfcse provide a set of Recommendations on security service for cloud security overview, architecture and framework, cross-layers cloud security and specific security of network services. Currently there is a strong need for securing cloud computing enabled critical voice, multi-media, identity based services, information assurance services, identity and data services, and emergency based services. This Question is intended to develop new Recommendations based on the Focus Group Cloud Technical Report Part 5 for:

 best practices and guidelines development to guide on how to provide security in a cloud computing based environment;

 responsibility clarification, and security requirements and threats definition for the main actors and related roles in the cloud computing ecosystem;

 security architecture based on the reference architecture provided by Q.27/13;

 security management and audit technologies for the trust management.

Question 8/17 will collaborate with related Questions such as 2/17, 3/17, 4/17, 7/17, 10/17 and 11/17 to develop Recommendations on cloud computing security.

Recommendations under responsibility of this Question as of 2 March 2012: None.

Texts under development: X.ccsec, X.fsspvn, X.goscc and X.sfcse.

### 2 Question

Study items to be considered include, but are not limited to:

a) What new Recommendations or other type of documents should be developed for main actors like service providers, service users and services partners, and other key industry stakeholders to advance cloud computing security?

b) What new Recommendations should be developed for security architecture and security functionalities organization in line with the reference architecture?

c) What new Recommendations should be developed for security management, assurance mechanisms, audit technologies, and associated risks assessment to establish trust among different actors?

d) Under the auspices of the Joint Coordination Activity on cloud computing (JCA-cloud), what collaboration is necessary to minimize duplication of efforts with other Questions, study groups, and SDOs?

e) How security as a service should be developed to protect telecommunication/ICT systems?

### 3 Tasks

Tasks include, but are not limited to:

a) Developing Recommendations or other type of documents to advance cloud computing security.

b) Developing Recommendations to identify security requirements and threats to secure cloud computing services based on the general requirements of cloud computing specified by ITU‑T Study Group 13.

c) Developing Recommendations to define security architecture and to organize security functions based on the reference architecture specified by ITU‑T Study Group 13.

d) Developing Recommendations to define a strong, flexible and elastic security management architecture and implementation for cloud computing systems.

e) Developing Recommendations to identify assurance mechanisms, audit technologies, risk assessment with the objective of achieving trustworthy relationships within the cloud computing ecosystem.

f) Taking charge of all the Study Group 17 activities on cloud computing.

g) Representing the work of Study Group 17 related to cloud computing security in the Joint Coordination Activity on cloud computing (JCA-Cloud).

### 4 Relationships

Recommendations:

• Y-series Recommendations on cloud computing

Questions:

• ITU‑T Qs 1/17, 2/17, 3/17, 4/17, 7/17, 10/17 and 11/17

**Study Groups:**

• ITU‑T SGs 2, 13 and 16.

Standardization bodies:

• ISO/IEC JTC 1/SCs 27 and SC 38; OASIS; IETF and other relevant bodies as identified

Other bodies:

• DMTF; CSA (Cloud Security Alliance).

ANNEX 2  
(to TSB Circular 35)

Text of revised Question 12/17

Formal languages for telecommunication software and testing

(Continuation of part of Q13/17, and part of Q14/17)

### 1 Motivation

This Question supports the continued development of a variety of formal languages that are in wide-spread use in telecommunications system design and testing.

#### 1.1 Motivation for the work on formal languages for telecommunication software

This Question covers formal ITU system design languages to define the requirements, architecture, and behaviour of telecommunications systems: requirements languages, specification, and implementation languages. The formal languages for these areas of engineering are widely used in industry and ITU‑T and commercial tools support them. The languages can be applied collectively or individually for specification of standards and the realization of products. The ITU system design languages of concern are (in Recommendation order):

• Specification and Description Language;

• Message Sequence Chart language;

• User Requirements Notation;

• CHILL – The ITU‑T Programming Language.

The User Requirements Notation is applied for the analysis of goals and the definition of use cases, particularly at the initial stages of design. The Specification and Description Language allows the stimulus and response behaviour of entities to be specified, and can be combined with the specification of data units in ASN.1. The sequence of messages between entities can be described in a Message Sequence Chart set, which can also be used to trace the way a system behaves. CHILL - The ITU‑T Programming Language – has been used widely in the past, but in recent years alternative approaches have been used such as generating code from the Specification and Description Language.

Additional Recommendations, where needed, will be developed to accommodate advances in technology and additional requirements from users of these ITU system design languages as both telecommunication systems and the environment in which they exist evolve.

Recommendation ITU‑T Z.109 provides a UML profile for the Specification and Description Language, constrains UML models to a well-defined behaviour that avoids semantic variations inherent in the OMG standard and parts of UML not needed for behaviour covered by the Specification and Description Language. This also enables integration of UML elements with Specification and Description Language elements. In 2008 it was envisaged that profiles would be provided for other ITU system design languages, and that UML would be used as a basis for more formal integration of the ITU languages. This vision was not realized due to lack of resources and contributions, but in principle is still within the scope of the languages study.

Recommendations ITU‑T Z.111 and Z.119 are used as included references in other Recommendations (in particular the Z.100 series and Z.150 series) and provide guidelines on how any new language Recommendation should be written.

Recommendations under responsibility of this Question as of 1 December 2012: Z.100, Z.101, Z.102, Z.103, Z.104, Z.105, Z.106, Z.107, Z.109, Z.111, Z.119, Z.120, Z.121, Z.150, Z.151, and Z.200.

Texts under development: none.

#### 1.2 Motivation for the work on methodology using formal languages for telecommunication software

This Question covers the use of formal ITU system design languages to define the requirements, architecture, and behaviour of telecommunications systems: requirements languages, data description, behaviour specification, testing and implementation languages. The formal languages for these areas of engineering are widely used in industry and ITU‑T and commercial tools support them. The languages can be applied collectively or individually for specification of standards and the realization of products, but in all cases a framework and methodology is essential for effective use. The ITU system design languages are (in Recommendation order):

• Abstract Syntax Notation One (ASN.1);

• Specification and Description Language;

• Message Sequence Chart language;

• User Requirements Notation;

• Testing and Test Control Notation;

• CHILL - The ITU‑T Programming Language.

The User Requirements Notation is applied for the analysis of goals and the definition of use cases, particularly at the initial stages of design. ASN.1 has proved to be the notation-of-choice for many standardization groups for specification of information passed between entities, and with the associated encoding rules ensure the information can be passed unambiguously, securely and efficiently. The Specification and Description Language allows the stimulus and response behaviour of entities to be specified, and can be combined with the specification of data units in ASN.1. The sequence of messages between entities can be described in a Message Sequence Chart set, which can also be used to trace the way a system behaves. The Testing and Test Control Notation allows tests for functionality and interoperability of systems to be specified and generic test suites to be written. CHILL - The ITU‑T Programming Language – has been used widely in the past, but in recent years alternative approaches have been used such as generating code from the Specification and Description Language.

The need for advice and assistance to other study groups, external standards development organizations and countries on both ASN.1 notational matters and management of the OID namespace led to establishment of the highly successful ITU‑T "ASN.1 & OID Project" with an appointed project leader. One of the reasons for the success of this project is the availability of machine-readable ASN.1 validated code from the ITU‑T. Serious consideration should be given to funding resources for a similar project for other ITU system design languages such as the Specification and Description Language or the Testing and Test Control Notation, to improve the quality of published Recommendations.

Recommendations and other documents exist on the methodology and framework for application of these languages such as X.290 to X.296, Z.110, Z.450, Z.500 and Z.Supp1.

The usefulness to members of Recommendations ITU‑T Z.400, Z.600 and Z.601 is in doubt.

Recommendations and Supplements under responsibility of this Question as of 1 December 2012: Z.110, Z.400, Z.450, Z.600, Z.601, and Z.Supp1.

#### 1.3 Motivation for the work on testing languages

ITU‑T is producing a large number of Recommendations. To achieve interoperability, it is essential that implementations of these Recommendations conform to the Recommendations.

Test specification languages need to be developed and maintained, which can be used in testing ITU-T Recommendations developed by the relevant ITU-T SGs and especially SG11, as the lead group on test specifications, conformance and interoperability testing.

In particular it is required to address Testing and Test Control Notation, version 3 (TTCN-3) test specification language.

These Recommendations need to be maintained and updated when appropriate. New Recommendations or other documentation may be identified, to meet the needs of users in ITU, the industry, and other organizations such as OMG.

Recommendations and Supplements under responsibility of this Question as of 1 December 2012: X.292, Z.161, Z.161.1, Z.162, Z.163, Z.164, Z.165, Z.165.1, Z.166, Z.167, Z.168, Z.169 and Z.170.

### 2 Question

Study items to be considered include, but are not limited to:

#### 2.1 Study items related to the work on formal languages for telecommunication software

a) The definitions of existing or define new languages that are adapted to further contemporary user requirements and emerging new architectures and frameworks?

#### 2.2 Study items related to the work on methodology using formal languages for telecommunication software

a) Revise the definitions of existing or define new methodologies and frameworks that are adapted to further contemporary user requirements and emerging new architectures and frameworks to ensure the creation of good quality Recommendations and systems?

b) What tutorial activity or other support is needed to support the use of the languages in a variety of environments, but in particular ITU‑T Study Groups?

#### 2.3 Study items related to the work on testing languages

a) What extensions or enhancements to existing Recommendations on testing languages based on formal models are required to meet evolving needs of users?

b) What new Recommendations, Supplements or other provisions are required (if any) to define or revise the definitions of new or existing testing languages?

### 3 Tasks

Tasks include, but are not limited to:

#### 3.1 Tasks related to the work on formal languages for telecommunication software

a) Monitor, assist and progress publication of all approved Recommendations under this study and other work in hand under this study at the end of the last Study Period.

b) Maintain the ITU system design languages under this Question by providing updated Recommendations and other documents throughout the study period in response to user needs, producing new editions when appropriate with direction of the effort towards relative stability of the languages but with improved usability.

c) Resolve reports of language errors (present at the start of the Study Period and any new ones arising during the Study Period) progress corrections as necessary, and if there is a defined procedure for the language in a Recommendation (e.g. Z.100) following that procedure.

d) Identify and if needed adopt other relevant requirements, specification, implementation and testing languages as ITU‑T Recommendations taking into account Z.110, and review the Recommendations under study to determine if any of them are no longer needed and can be deleted.

#### 3.2 Tasks related to the work on methodology using formal languages for telecommunication software

a) Monitor, assist and progress publication of all approved Recommendations under this study and other work in hand under this study at the end of the last Study Period.

b) Maintain the ITU system design methodologies and frameworks by providing updated Recommendations and other documents throughout the study period in response to user needs, producing new editions when appropriate with direction of the effort towards improved usability.

c) Identify and if needed adopt other relevant requirements, data, specification, implementation and testing languages to be included in ITU‑T methodologies taking into account Z.110, and review the Recommendations under study to determine if any of them (in particular Z.400, Z.600 and Z.601) are no longer needed and can be deleted or need significant redrafting.

d) Assuming that the creation of project is approved for a language or languages, under the responsibility of the Project Leader:

* + i) Provide general advice to users of the language(s), methodology(y/ies), framework(s) for the language(s) covered by the project(s);
  + ii) Promote the use of the methodologies, frameworks and languages covered by the project(s) within other study groups and external SDOs;
  + iii) Help the TSB to provide and maintain a web-based database of machine-readable language components defined in ITU‑T Recommendations.

#### 3.3 Tasks related to the work on testing languages

a) Progress work in the area of TTCN-3.

b) Maintenance of X.292, Z.161, Z.161.1, Z.162, Z.163, Z.164, Z.165, Z.165.1, Z.166, Z.167, Z.168, Z.169 and Z.170.

c) Progress work on testing languages and conformance testing based on formal models.

d) Consider extending the TTCN-3 notation to allow expanded use of ISO/IEC 10646 characters, with the possible exception of keywords.

### 4 Relationships

Recommendations:

• H.200-series, H.323, T.120, X.400-series, X.500-series, X.680/X.690 series, X.700-series, X.880-series, X.900-series

Questions:

• All ITU‑T Questions related to the above Recommendations.

Study groups:

• SG11, the Lead Study Group on test specifications, conformance and interoperability testing, all study groups that use the ITU system design languages (SGs 2, 11, 13 and 16 in particular) or specify tests (SGs 2, 9, 11, 13, 15 and 16 in particular)

Standardization bodies:

• All ISO/IEC JTC 1 and its sub-committees that use the ITU system design languages; ETSI; IETF; OASIS; OMG; W3C

Other bodies:

• SDL Forum Society.

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