

Draft Recommendation ITU-T Y.TRUST-TLA

Framework Of Trust-Level Assessment for Trustworthy Networking

Summary

With the rapid expansion of the mobile internet, networks and services on it becomes an indispensable part of human society. Billions of users are using the mobile internet for their daily services, and governments have put almost all the critical services online. On the other hand, various security accidents such as user data stolen, blackmail, and DDoS attack etc. cause the users of internet worrying about the network security and data privacy. Some governments are worrying about the trustworthiness of the network infrastructure. The trustworthiness of the networks and services becomes more and more important to the vast users.

Starting from 5G, the trustworthiness becomes one of the top challenges facing by the users, commercial institutions, vendors and government. As a critical pillar of the internet, telecommunication networks become the eye of the wind. To tackle the challenge, both academic and industry are considering to integrate the trustworthiness in the design of next generation telecommunication networks and services. Although significant research and standardization work have been done for adopting trust in network services, however, there are still gaps to integrate trust with real network and services. A major obstacle is that the output from a trust model normally is a value between 0 and 1. It is too ambiguous for the services and network equipment to reach a common agreement on the trust. Therefore, a clear definition of the trust levels can help both services and network to understand each other on trust requirement.

This work item will study the definition of trust levels, how to specify trust levels for trustworthy networks, what types of data should be gathered for assessment, and how to process the gathered data for trust levels assessment.

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Draft Recommendation ITU-T Y.TRUST-TLA

Framework Of Trust-Level Assessment for Trustworthy Networking

1. Scope

This Recommendation aims to study framework of trust-level assessment for trustworthy networking. This recommendation covers the following issues, but not limited to:

- trust levels definition and specification
- trust level related data gathering and processing
- trust level assessment

2. References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T Y.3051] Recommendation ITU-T Y.3051: Basic principles of trusted environment in information and communication technology infrastructure.

[ITU-T Y.3052] Recommendation ITU-T Y.3052: Overview of Trust Provisioning in Information and Communication Technology Infrastructure and Services.

[ITU-T Y.3053] Recommendation ITU-T Y.3053: Framework of Trustworthy Networking with Trust-centric Network Domains.

[ITU-T Y.3054] Recommendation ITU-T Y.3054: Framework for Trust-based Media Services

[ITU-T Y.3055] Recommendation ITU-T Y.3055: Framework for Trust-based Personal Data Management.

[ITU-T Y.trust-index] Draft Recommendation ITU-T Y.trust-index: A trust index model for ICT infrastructures and services

[ITU-T X.5GSec-t] Draft Recommendation ITU-T X.5Gsec-t: Security framework based on trust relationship for IMT-2020 ecosystem

[ITU-T Y.trust-arch] Draft Recommendation ITU-T Y.trust-arch: "Functional architecture for trust enabled service provisioning"

3. Definitions

3.1. Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

[TBD]

3.2. Terms defined in this Recommendation

This Recommendation defines the following terms:

[TBD]

4. Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

[TBD]

5. Conventions

In this Recommendation:

The keywords "is required to" indicate a requirement which must be strictly followed and from which no deviation is permitted, if conformance to this Recommendation is to be claimed.

The keywords "is recommended" indicate a requirement which is recommended but which is not absolutely required. Thus, this requirement need not be present to claim conformance.

The keywords "can optionally" indicate an optional requirement which is permissible, without implying any sense of being recommended. This term is not intended to imply that the vendor's implementation must provide the option, and the feature can be optionally enabled by the network operator/service provider. Rather, it means the vendor may optionally provide the feature and still claim conformance with this Recommendation.

6. Background and motivations

6.1. Background

In 1960's, when the internet broke the ground and open a new communication paradigm for the human society, a few nodes were connected and simple services such as messages, emails, and FTP are provided. In the early stage of the Internet, only limited number of users had the chances to access the Internet. Security was not an issue and thus not seriously considered. Designers of the Internet protocols simply believe that equipment and services on the internet are trustworthy. However, in the past 30 years, the Internet expands in an exponential style, many users and organization are using the Internet for their daily services, especially after the mobile Internet like 4G and 5G are deployed.

However, due to the lack of security in mind during the designing of Internet, more and more network issues and cyber-crimes occur nowadays, leading to severe impacts such as personal data leakage, damage to personal safety and property safety, and even critical civil infrastructure breakdown. Traditional security mechanisms are not sufficient to handle this situation, and the native trustworthiness should be integrated into the design and implementation of future networks.

Trustworthiness is becoming more and more important for the ICT infrastructure and services, and thus is expected to be natively integrated into the design of future networks such as 6G. Since 2017, a series of recommendations regarding trust have been published by ITU-T, including Y.3051, Y.3052, Y.3053, Y.3054, Y.3055 and Y.trust-index etc. These recommendations have pushed the trust from academic research to real networks and services.

6.2. Motivation

An overview of trust provisioning for ICT infrastructures has been provided by ITU-T Y.3052. In Y.trust-index, the definition of trust index was given, as well as an architecture for trust index evaluation. In addition, Y.3053 mentioned trust level for many times and proposed to use it to support trustworthy networking between trust-centric network domains. However, to adopt trust level in future networks, some further efforts have to be conducted. .

7. Trust Levels

Editor's Note: This clause will describe the definition of trust levels and recommend the relative levels for future networks.

7.1. Trust Level Definition

Editor's Note: This clause will give a formal definition of trust levels for equipment in future networks.

[TBD]

7.2. Trust Level specification

Editor's Note: This clause will specify trust levels for network equipment in future networks.

[TBD]

8. Requirements of trust assessment for trustworthy networking

8.1. Requirements for trust related data gathering and processing

Editor's note: This section will provide the high level requirements of Y.TRUST-TLR, contributions are welcomed.

[TBD]

8.2. Requirements for trust level evaluation and assessment

Editor's note: functional requirements of Y.TRUST-TLR will be addressed in this clause, contributions are welcomed.

[TBD]

8.3. Requirements for trust level information lifecycle management for network elements

9. Functional Architecture

9.1. Overview

Editor's note: A functional architecture of trust level assessment for trustworthy networking will be presented in this clause. Contributions are welcomed.

9.2. Trust level related gathering and processing functions

Editor's note: entity set of functional entities to support trust level related data gathering and processing will be presented in this sub-clause, contributions are welcomed.

9.3. Trust level evaluation and assessment functions

Editor's note: a set of functional entities to support trust level evaluation and assessment will be present in this sub-clause, contributions are welcomed.

Annex 1

A.1 justification for Proposal for initiating a new work item on framework of trust-level assessment for trustworthy networking

NOTE – The following work item will be started if no comments from IETF and ITU-T SG17 are received by the deadline (31 March 2022).

Question:	16/13	Proposed new ITU-T Recommendation	Virtual, 29 Nov – 10 Dec 2021
Reference and title:	Y.TRUST-TLA “Framework of trust-level assessment for trustworthy networking”		
Base text:	TD702/WP3	Timing:	March, 2024
Editor(s):	Yu Jiang, China Telecom, China jiangyu@chinatelecom.cn Yang Xie, China Telecom, China xiey17@chinatelecom.cn Haiguang Wang, Huawei Technologies wang.haiguang1@huawei.com Xiang Liu, Huawei Technologies liuxiang90@huawei.com	Approval process:	TAP
<p>Scope (defines the intent or object of the Recommendation and the aspects covered, thereby indicating the limits of its applicability):</p> <p>This Recommendation aims to study the framework of trust-level assessment for future networking. This recommendation covers the following:</p> <ul style="list-style-type: none"> - trust levels definition and specification - trust level related data gathering and processing - trust level assessment 			
<p>Summary (provides a brief overview of the purpose and contents of the Recommendation, thus permitting readers to judge its usefulness for their work):</p> <p>With the rapid expansion of the mobile internet, networks and services on it becomes an indispensable part of human society. Billions of users are using the mobile internet for their daily services, and governments have put almost all the critical services online. On the other hand, various security accidents such as user data stolen, blackmail, and DDoS attack etc. cause the users of internet worrying about the network security and data privacy. Some governments are worrying about the trustworthiness of the network infrastructure. The trustworthiness of the networks and services becomes more and more important to the vast users.</p> <p>Starting from 5G, the trustworthiness becomes one of the top challenges facing by the users, commercial institutions, vendors and government. As a critical pillar of the internet, telecommunication networks become the eye of the wind. To tackle the challenge, both academic and industry are considering to integrate the trustworthiness in the design of next generation telecommunication networks and services. Although significant research and standardization work have been done for adopting trust in network services, however, there are still gaps to integrate trust with real network and services. A major obstacle is that the output from a trust model normally is a value between 0 and 1. It is too ambiguous for the services and network equipment to reach a common agreement on the trust. Therefore, a clear definition of the trust levels can help both services and network to understand each other on trust requirement.</p> <p>This work item will study the definition of trust levels, how to specify trust levels for trustworthy networks, what types of data should be gathered for assessment, and how to process the gathered data for trust levels assessment.</p>			
<p>Relations to ITU-T Recommendations or to other standards (approved or under development):</p> <p>Y.3052, Y.3053, Y.trust-index</p>			

Liaisons with other study groups or with other standards bodies:

IETF, ITU-T SG12, SG16 and SG17.

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

China Telecom, Huawei Technologies, China Mobile, China Unicom, ZTE
