

Supplement

ITU-T Y Suppl. 84 (07/2024)

SERIES Y: Global information infrastructure, Internet protocol aspects, next-generation networks, Internet of Things and smart cities

Supplements to the Y-series Recommendations

ITU-T Y.3050-series – Standardization roadmap on trustworthy networking and services

Global information infrastructure, Internet protocol aspects, next-generation networks, Internet of Things and smart cities

GLOBAL INFORMATION INFRASTRUCTURE	Y.100-Y.999
General	Y.100-Y.199
Services, applications and middleware	Y.200-Y.299
Network aspects	Y.300-Y.399
Interfaces and protocols	Y.400-Y.499
Numbering, addressing and naming	Y.500-Y.599
Operation, administration and maintenance	Y.600-Y.699
Security	Y.700-Y.799
Performances	Y.800-Y.899
INTERNET PROTOCOL ASPECTS	Y.1000-Y.1999
General	Y.1000-Y.1099
Services and applications	Y.1100-Y.1199
Architecture, access, network capabilities and resource management	Y.1200-Y.1299
Transport	Y.1300-Y.1399
Interworking	Y.1400-Y.1499
Quality of service and network performance	Y.1500-Y.1599
Signalling	Y.1600-Y.1699
Operation, administration and maintenance	Y.1700-Y.1799
Charging	Y.1800-Y.1899
IPTV over NGN	Y.1900-Y.1999
NEXT GENERATION NETWORKS	Y.2000-Y.2999
Frameworks and functional architecture models	Y.2000-Y.2099
Quality of Service and performance	Y.2100-Y.2199
Service aspects: Service capabilities and service architecture	Y.2200-Y.2249
Service aspects: Interoperability of services and networks in NGN	Y.2250-Y.2299
Enhancements to NGN	Y.2300-Y.2399
Network management	Y.2400-Y.2499
Computing power networks	Y.2500-Y.2599
Packet-based Networks	Y.2600-Y.2699
Security	Y.2700-Y.2799
Generalized mobility	Y.2800-Y.2899
Carrier grade open environment	Y.2900-Y.2999
FUTURE NETWORKS	Y.3000-Y.3499
CLOUD COMPUTING	Y.3500-Y.3599
BIG DATA	Y.3600-Y.3799
QUANTUM KEY DISTRIBUTION NETWORKS	Y.3800-Y.3999
INTERNET OF THINGS AND SMART CITIES AND COMMUNITIES	Y.4000-Y.4999
General	Y.4000-Y.4049
Definitions and terminologies	Y.4050-Y.4099
Requirements and use cases	Y.4100-Y.4249
Infrastructure, connectivity and networks	Y.4250-Y.4399
Frameworks, architectures and protocols	Y.4400-Y.4549
Services, applications, computation and data processing	Y.4550-Y.4699
Management, control and performance	Y.4700-Y.4799
Identification and security	Y.4800-Y.4899
Evaluation and assessment	Y.4900-Y.4999

For further details, please refer to the list of ITU-T Recommendations.

Supplement 84 to ITU-T Y-series Recommendations

ITU-T Y.3050-series – Standardization roadmap on trustworthy networking and services

Summary

Supplement 84 to ITU-T Y-series Recommendations provides the standardization roadmap on trustworthy networking and services. It describes the landscape with related technical areas of trust technologies from an ITU-T perspective and lists related standards and publications developed in ITU-T.

History *

Edition	Recommendation	Approval	Study Group	Unique ID
1.0	ITU-T Y Suppl. 84	2024-07-26	13	11.1002/1000/16146

* To access the Recommendation, type the URL <https://handle.itu.int/> in the address field of your web browser, followed by the Recommendation's unique ID.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, and information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

This is an informative ITU-T publication. Mandatory provisions, such as those found in ITU-T Recommendations, are outside the scope of this publication. This publication should only be referenced bibliographically in ITU-T Recommendations.

INTELLECTUAL PROPERTY RIGHTS

ITU draws attention to the possibility that the practice or implementation of this publication may involve the use of a claimed Intellectual Property Right. ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the standards development process.

As of the date of approval of this publication, ITU had not received notice of intellectual property, protected by patents/software copyrights, which may be required to implement this publication. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the appropriate ITU-T databases available via the ITU-T website at <http://www.itu.int/ITU-T/ipr/>.

© ITU 2024

All rights reserved. No part of this publication may be reproduced, by any means whatsoever, without the prior written permission of ITU.

Table of Contents

	Page
1 Scope	1
2 References.....	1
3 Definitions	1
3.1 Terms defined elsewhere	1
3.2 Terms defined in this Supplement	1
4 Abbreviations and acronyms	2
5 Conventions	2
6 Landscape of trust technologies from an ITU-T perspective	2
7 Standards and publications for trust technologies in ITU-T.....	3
7.1 Trustworthy networking and services	3
7.2 Blockchain as one of the key trust technologies	12
Appendix I – Potential work items for standardization on trustworthy networking and services	16
I.1 Standardization roadmap and challenges	16
I.2 Proposal	18
Bibliography.....	21

Supplement 84 to ITU-T Y-series Recommendations

ITU-T Y.3050-series – Standardization roadmap on trustworthy networking and services

1 Scope

This Supplement provides the standardization roadmap on trustworthy networking and services. It addresses the following subjects:

- landscape and related technical areas of trust technologies from an ITU-T perspective;
- The collection of related standards and publications on trust technologies in ITU-T.

2 References

- [ITU-T Y.3051] Recommendation ITU-T Y.3051 (2017), *The basic principles of trusted environment in information and communication technology infrastructure.*
- [ITU-T Y.3052] Recommendation ITU-T Y.3052 (2017), *Overview of trust provisioning in information and communication technology infrastructures and services.*
- [ITU-T Y.3053] Recommendation ITU-T Y.3053 (2018), *Framework of trustworthy networking with trust-centric network domains.*
- [ITU-T Y.3054] Recommendation ITU-T Y.3054 (2018), *Framework for trust-based media services.*
- [ITU-T Y.3055] Recommendation ITU-T Y.3055 (2020), *Framework for trust-based personal data management.*
- [ITU-T Y.3056] Recommendation ITU-T Y.3056 (2021), *Framework for bootstrapping of devices and applications for open access to trusted services in distributed ecosystems.*
- [ITU-T Y.3057] Recommendation ITU-T Y.3057 (2021), *A trust index model for information and communication technology infrastructures and services.*
- [ITU-T Y.3058] Recommendation ITU-T Y.3058 (2023), *Functional architecture for trust enabled service provisioning.*
- [ITU-T Y.3059] Recommendation ITU-T Y.3059 (2023), *Trust registry for devices – Requirements, architectural framework.*
- [ITU-T Y.3060] Recommendation ITU-T Y.3060 (2023), *Autonomous networks – Overview on trust.*

3 Definitions

3.1 Terms defined elsewhere

This Supplement uses the following term defined elsewhere:

3.1.1 trust [ITU-T Y.3052]: The measurable belief and/or confidence which represents accumulated value from history and the expecting value for the future.

NOTE – Trust is quantitatively and/or qualitatively calculated and measured. Trust is used to evaluate values of entities, value-chains among multiple stakeholders and human behaviours, including decision making.

3.2 Terms defined in this Supplement

None.

4 Abbreviations and acronyms

This Supplement uses the following abbreviations and acronyms:

ACS	Access Control Service
AN	Autonomous Network
CTI	Cyber Threat Intelligence
DIKW	Data-Information-Knowledge-Wisdom
DLT	Distributed Ledger Technology
DNA	Data, Network and AI
DPM	Data Processing and Management
FML	Federated Machine Learning
ICT	Information and Communication Technology
IMT	International Mobile Telecommunications
IoT	Internet of Things
ML	Machine Learning
NGN	Next Generation Network
P2P	Peer-to-Peer
QoE	Quality of Experience
QoM	Quality of Media
QoS	Quality of Service
SC&C	Smart Cities and Communities
SLA	Service Level Agreement
SNS	Social Networking Service
ZT	Zero Trust

5 Conventions

None.

6 Landscape of trust technologies from an ITU-T perspective

The concept of trust implies belief and confidence that the functional entities in information and communication technology (ICT) infrastructures and services will behave in expected ways. As ICT-based applications and services underpin other industrial domains and involve multiple stakeholders, trust evaluation of the corresponding value chains of business, as well as of the system and component levels, in a holistic manner can enable users to have confidence in their services and applications. Consequently, trust provisioning is one of the most important functional capabilities in ICT infrastructures and services [ITU-T Y.3052].

Trust provisioning in ICT infrastructures and services consists of a set of processes that include gathering data from entities and producing trust information by evaluating all aspects of trust to

support the decision making of entities when establishing trust relationships with other entities [ITU-T Y.3052].

The ultimate purpose for trust provisioning in ICT infrastructure is to develop a trust infrastructure that cooperates with ICT applications and services to assess and compute all aspects of trust among any entities in the future ICT environments; in order to support these applications and services for better quality of services and experience. Therefore, the existing ICT applications and services need a way to offer trust provisioning processes to provide trustworthy ICT services.

Trust enabled service is a reliable service, which satisfies service and trust requirements, by applying additional functions for trust provisioning processes to conventional ICT service entities (including resources, stakeholders, and users) and that is able to develop better quality of services and experience.

The trust provisioning process consists of data collection, data management, trust information analysis, dissemination of trust information and trust information lifecycle management. To deploy the trust service, trust components and platform architecture are described in clause 7.3 of [b-CG-Trust-TR]. This Supplement therefore specifies functional architecture for trust enabled service provisioning which includes related functional blocks, reference points and procedures to support trust provisioning processes.

Figure 1 shows the concept of trust enabled service provisioning and describes service provisioning flow about conventional ICT services and trust enabled services. Conventional ICT services provide discovery, aggregation and processing of the required resources and the service provisioning functions assign resources according to the service request.

Trust enabled services provide collection, management, analysis and dissemination of trust data through the trust provisioning functions that are developed based on the trust components in [b-CG-Trust-TR]. The trust provisioning functions consist of trust agent, trust broker and trust analysis and management. The trust enabled service provisioning functions also assign the resources according to the trust requirements and service request.

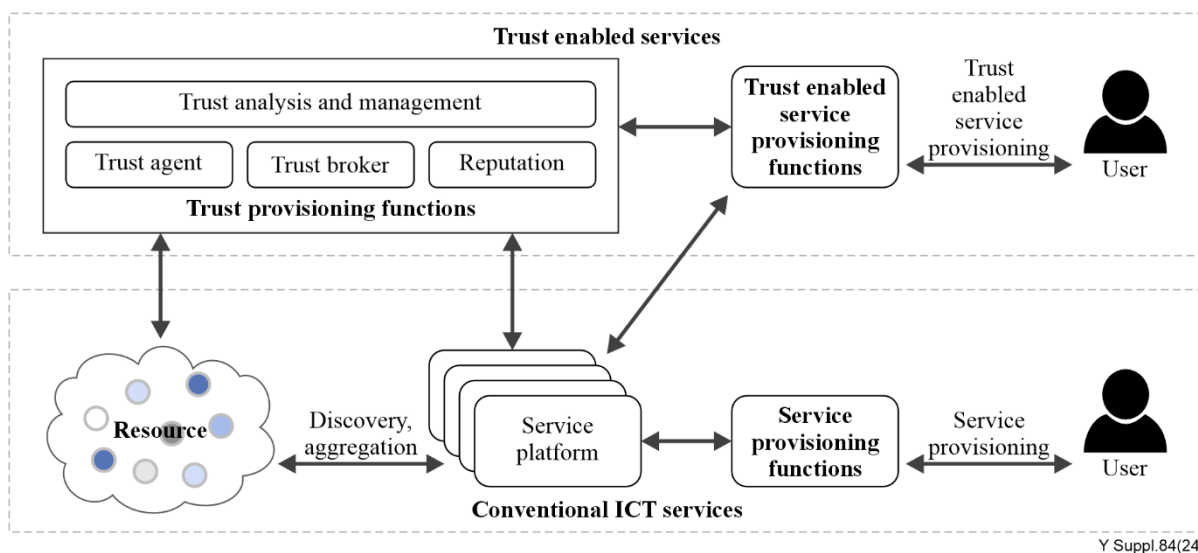


Figure 1 – The concept of trust enabled service provisioning

7 Standards and publications for trust technologies in ITU-T

7.1 Trustworthy networking and services

Figure 2 shows the relationship between ITU-T Recommendations and draft Recommendations on trustworthy networking and services in SG13, and Table 1 gives their summaries and status.