

Recommendation

ITU-T Y.2345 (05/2023)

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

Next Generation Networks – Enhancements to NGN

Scenarios and requirements of network resource sharing based on distributed ledger technology

ITU-T Y-SERIES RECOMMENDATIONS

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

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

Recommendation ITU-T Y.2345

Scenarios and requirements of network resource sharing based on distributed ledger technology

Summary

Recommendation ITU-T Y.2345 aims to provide the overview and general framework of the network resource sharing based on distributed ledger technology and specifies scenarios and capability requirements which are derived from use cases.

History ¹

Edition	Recommendation	Approval	Study Group	Unique ID
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Distributed ledger technology, network resource sharing, requirements, scenarios.

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Recommendation ITU-T Y.2345

Scenarios and requirements of network resource sharing based on distributed ledger technology

1 Scope

This Recommendation specifies the scenarios and capability requirements of network resource sharing based on distributed ledger technology.

The scope of this Recommendation includes:

- 1) Overview of network resource sharing.
- 2) General framework of network resource sharing based on distributed ledger technology.
- 3) Capability requirements of network resource sharing based on distributed ledger technology.
- 4) Scenarios and use cases of network resource sharing based on distributed ledger technology.

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 X.1400] Recommendation ITU-T X.1400 (2020), *Terms and definitions for distributed ledger technology*.
- [ITU-T Y.2340] Recommendation ITU-T Y.2340 (2016), *Next generation network evolution phase 1 – Overview*.
- [ITU-T Y.2342] Recommendation ITU-T Y.2342 (2019), *Scenarios and capability requirements of blockchain in next generation network evolution*.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 distributed ledger [ITU-T X.1400]: A type of ledger that is shared, replicated, and synchronized in a distributed and decentralized manner.

3.1.2 smart contract [ITU-T X.1400]: Program written on a distributed ledger system which encodes the rules for specific types of distributed ledger system transactions in a way that can be validated, and triggered by specific conditions.

3.1.3 transaction [ITU-T X.1400]: Whole of the exchange of information between nodes. A transaction is uniquely identified by a transaction identifier.

3.1.4 entity [b-ITU-T F.751.4]: Anything that has a separately identifiable existence (e.g., organization, person, group or device). An entity uses distributed ledger technology to solve the problem of its business or information systems.

3.1.5 participant [b-ITU-T X.1405]: Entity who participates in the DLT system's decision making. For example, miners, validators, node owners, orders, voters, etc.

3.1.6 node [ITU-T X.1400]: Device or process that participates in a distributed ledger network.

3.2 Terms defined in this Recommendation

None.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

API	Application Programming Interface
CCPE	Computing Capabilities Provider at the Edge
DLT	Distributed Ledger Technology
HPC	High Performance Computing
ICT	Information and Communication Technologies
IoT	Internet of Things
NRB	Network Resource Broker
NRC	Network Resource Customer
NRNSM	Network Resource Node Service Maintainer
NRNSP	Network Resource Node Service Provider
NRP	Network Resource Provider
NSP	Node Service Provider
ProSe	Proximity-based Service
QoS	Quality of Service

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 Overview of network resource sharing

6.1 Background

Network resource sharing is the system that support the users of different networks to share the network resource among networks as business demands, including sharing computing, storage, connection and data resource.