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NEXT-GENERATION NETWORKS, INTERNET OF
THINGS AND SMART CITIES

Future networks

Framework of network slicing with AI-assisted analysis in IMT-2020 networks

CAUTION !

PREPUBLISHED RECOMMENDATION

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FOREWORD

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Draft new Recommendation ITU-T Y.3156 (formerly Y.IMT2020-NSAA-reqts)

Framework of network slicing with AI-assisted analysis in IMT-2020 networks

Summary

For the future enhanced operation and maintenance management of network slicing with the purpose of satisfying users' service level agreement (SLA) requirements, this Recommendation describes the requirements and functional roles of AI-assisted analysis which supports the lifecycle management and orchestration of network slicing.

Keywords

IMT-2020, network slice, AI-assisted analysis, management and orchestration

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Framework of network slicing with AI-assisted analysis in IMT-2020 networks

1 Scope

The draft Recommendation describes the framework for the AI-assisted analysis of network slicing in IMT-2020 networks, which support the whole lifecycle management and orchestration of a network slice. This Recommendation includes:

- Requirements of AI-assisted analysis;
- General functional roles of AI-assisted analysis;
- Relations with network slice management and orchestration.

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.

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|----------------|---|
| [ITU-T Y.3100] | Recommendation ITU-T Y.3100 Corrigendum 1 (2018), <i>Terms and definitions for IMT-2020 network</i> . |
| [ITU-T Y.3111] | Recommendation ITU-T Y.3111 (2017), <i>IMT-2020 network management and orchestration framework</i> . |
| [ITU-T Y.3150] | Recommendation ITU-T Y.3150 (2019), <i>High-level technical characteristics of network softwarization for IMT-2020</i> . |
| [ITU-T Y.3151] | Recommendation ITU-T Y.3151 (2019), <i>High level technical characteristics of network slice support for IMT-2020 - part: SDN</i> . |
| [ITU-T Y.3153] | Recommendation ITU-T Y.3153 (2019), <i>Network slice orchestration and management for providing network services to 3rd party in the IMT-2020 network</i> . |
| [ITU-T Y.3154] | Recommendation ITU-T Y.3154 (2019), <i>Resource pooling for scalable network slice service management and orchestration in the IMT-2020 network</i> . |
| [ITU-T Y.3170] | Recommendation ITU-T Y.3170 (2018), <i>Requirements for machine learning-based quality of service assurance for the IMT-2020 network</i> . |
| [ITU-T Y.3172] | Recommendation ITU-T Y.3172 (2019), <i>Architectural framework for machine learning in future networks including IMT-2020</i> . |
| [ITU-T Y.3324] | Recommendation ITU-T Y.3324 (2018), <i>Requirements and architectural framework for autonomic management and control of IMT-2020 networks</i> . |

3 Definitions

3.1 Terms defined elsewhere

3.1.1 network slice [ITU-T Y.3100]: A logical network that provides specific network capabilities and network characteristics.

NOTE 1 – Network slices enable the creation of customized networks to provide flexible solutions for different market scenarios which have diverse requirements, with respect to functionalities, performance and resource allocation.

NOTE 2 – A network slice may have the ability to expose its capabilities.

NOTE 3 – The behaviour of a network slice is realized via network slice instance(s).

3.1.2 network slice instance [ITU-T Y.3100]: An instance of network slice, which is created based on network slice blueprint.

NOTE 1 – A network slice instance is composed of a set of managed run-time network functions, and physical/logical/virtual resources to run these network functions, forming a complete instantiated logical network to meet certain network characteristics required by the service instance(s).

NOTE 2 – A network slice instance may also be shared across multiple service instances provided by the network operator. A network slice instance may be composed of none, one or more sub-network slice instances which may be shared with another network slice instance.

3.1.3 mobile network [b-Q.1762/Y.2802]: A network that provides wireless access to its services and supports mobility.

3.1.4 IMT-2020 [ITU-T Y.3100]: Systems, system components, and related technologies that provide far more enhanced capabilities than those described in [b-ITU-R M.1645].

3.1.5 network function [ITU-T Y.3100]: In the context of IMT-2020, a processing function in a network.

NOTE 1 – Network functions include but are not limited to network node functionalities, e.g., session management, mobility management and transport functions, whose functional behaviour and interfaces are defined.

NOTE 2 – Network functions can be implemented on a dedicated hardware or as virtualized software functions.

NOTE 3 – Network functions are not regarded as resources, but rather any network functions can be instantiated using the resources.

3.1.6 machine learning model [ITU-T Y.3172]: Model created by applying machine learning techniques to data to learn from.

NOTE 1 – A machine learning model is used to generate predictions (e.g., regression, classification, clustering) on new (untrained) data.

NOTE 2 – A machine learning model may be encapsulated in a deployable fashion in the form of a software (e.g., virtual machine, container) or hardware component (e.g., IoT device).

NOTE 3 – Machine learning techniques include learning algorithms (e.g., learning the function that maps input data attributes to output data).

3.1.7 service level agreement [b-ITU-T Y.3500]: Documented agreement between the service provider and customer that identifies services and service targets.

NOTE 1 – A service level agreement can also be established between the service provider and a supplier, an internal group or a customer acting as a supplier.

NOTE 2 – A service level agreement can be included in a contract or another type of documented agreement.