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SERIES M: TELECOMMUNICATION MANAGEMENT,
INCLUDING TMN AND NETWORK MAINTENANCE

Telecommunications management network

Framework of artificial intelligence enhanced telecom operation and management (AITOM)

Recommendation ITU-T M.3080

ITU-T

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Recommendation ITU-T M.3080

Framework of artificial intelligence enhanced telecom operation and management (AITOM)

Summary

Recommendation ITU-T M.3080 provides a framework of artificial intelligence enhanced telecom operation and management (AITOM). It describes the functional framework of AITOM to support telecom operation management for efficiency improvement, quality assurance, cost management, and security assurance. It also describes artificial intelligence (AI) pipelines that combine some components to enable AI based applications.

This Recommendation also describes the relationship of the functional framework of AITOM with smart operations, management and maintenance (SOMM) presented in Recommendation ITU-T M.3041. General requirements of security are also described.

History

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Recommendation ITU-T M.3080

Framework of artificial intelligence enhanced telecom operation and management (AITOM)

1 Scope

This Recommendation provides a framework for artificial intelligence (AI) enhanced telecom operation and management (AITOM). It describes the functional framework of AITOM to support telecom operation management for efficiency improvement, quality assurance, cost management, and security assurance. It also describes the artificial intelligence (AI) pipeline which combines some components to enable AI based applications.

This Recommendation also describes the relationship of the functional framework of AITOM with smart operations, management and maintenance (SOMM). General requirements of security are also described.

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 M.3010] Recommendation ITU-T M.3010 (2000), *Principles for a telecommunications management network*.
- [ITU-T M.3016.2] Recommendation ITU-T M.3016.2 (2005), *Security for the management plane: Security services*.
- [ITU-T M.3041] Recommendation ITU-T M.3041 (2020), *Framework of smart operation, management and maintenance*.
- [ITU-T X.805] Recommendation ITU-T X.805 (2003), *Security architecture for systems providing end-to-end communications*.
- [ITU-T X.1111] Recommendation ITU-T X.1111 (2007), *Framework of security technologies for home network*.
- [ITU-T Y.3100] Recommendation ITU-T Y.3100 (2017), *Terms and definitions for IMT-2020 network*.
- [ITU-T Y.3172] Recommendation ITU-T Y.3172 (2019), *Architectural framework for machine learning in future networks including IMT-2020*.
- [ETSI GR ENI 004] European Telecommunication Standards Institute (2019), *Experiential Networked Intelligence (ENI); Terminology for Main Concepts in ENI*.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 artificial intelligence (AI) [ETSI GR ENI 004]: Computerized system that uses cognition to understand information and solve problems.

NOTE 1 – ISO/IEC 2382-28 defines AI as "an interdisciplinary field, usually regarded as a branch of computer science, dealing with models and systems for the performance of functions generally associated with human intelligence, such as reasoning and learning".

NOTE 2 – In computer science AI research is defined as the study of "intelligent agents": any device that perceives its environment and takes actions to achieve its goals.

NOTE 3 – This includes pattern recognition, the application of machine learning and related techniques.

NOTE 4 – Artificial-intelligence is the whole idea and concept of machines being able to carry out tasks in a way that mimics human intelligence and would be considered "smart".

3.1.2 management function [ITU-T M.3010]: The smallest part of a business process (or management service) as perceived by the user of the process (or service).

3.1.3 management function set [ITU-T M.3010]: A grouping of management functions that contextually belong together.

3.1.4 machine learning (ML) [ITU-T Y.3172]: Processes that enable computational systems to understand data and gain knowledge from it without necessarily being explicitly programmed.

NOTE 1 – This definition is from [ETSI GR ENI 004].

NOTE 2 – Supervised machine learning and unsupervised machine learning are two examples of machine learning types.

3.1.5 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).

3.1.6 machine learning pipeline [ITU-T Y.3172]: A set of logical nodes, each with specific functionalities, that can be combined to form a machine learning application in a telecommunication network.

3.1.7 management service [ITU-T M.3010]: A management service is an offering fulfilling specific telecommunications management needs.

3.1.8 orchestration [ITU-T Y.3100]: In the context of IMT-2020, the processes aiming at the automated arrangement, coordination, instantiation and use of network functions and resources for both physical and virtual infrastructures by optimization criteria.

3.1.9 orchestrator [ITU-T Y.3100]: In the context of IMT-2020, an entity that fulfils orchestration functions.