

Recommendation

ITU-T Q.5031 (06/2024)

SERIES Q: Switching and signalling, and associated measurements and tests

Signalling requirements and protocols for IMT-2020 –
Protocols for IMT-2020

Protocol for traffic flow coordination of multi-modality communication

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Recommendation ITU-T Q.5031

Protocol for traffic flow coordination of multi-modality communication

Summary

Recommendation ITU-T Q.5031 specifies protocols, signalling flows and message formats for multi-modality communication. It specifies traffic coordination between two or more traffic flows of one terminal, and two or more traffic flows of two or more terminals.

History^{*}

Edition	Recommendation	Approval	Study Group	Unique ID
1.0	ITU-T Q.5031	2024-06-29	11	11.1002/1000/15981

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^{*} 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

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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.

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Recommendation ITU-T Q.5031

Protocol for traffic flow coordination of multi-modality communication

1 Scope

This Recommendation specifies protocols, signalling flow and message format for multi-modality communication. It specifies traffic coordination between two or more traffic flows of one terminal, and two or more traffic flows of two or more terminals.

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.3100] Recommendation ITU-T Y.3100 (2017), *Terms and definitions for IMT-2020 network*.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 IMT-2020 [ITU-T Y.3100]: (Based on [ITU-R M.2083-0]) Systems, system components, and related technologies that provide far more enhanced capabilities than those described in [b-ITU-R M.1645].

3.1.2 management [ITU-T Y.3100]: In the context of IMT-2020, the processes aiming at fulfilment, assurance, and billing of services, network functions, and resources in both physical and virtual infrastructure including compute, storage, and network resources.

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

3.1.4 user plane [b-ITU-T Y.2011]: A synonym for data plane.

3.1.5 PDU session [ITU-T Y.3100]: In the context of IMT-2020, an association between a user equipment (UE) and a data network that provides a protocol data unit (PDU) connectivity service.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 PDU set: A set of protocol data units (PDUs) which have the same priority and importance.

3.2.2 PDU set group: A group of protocol data unit (PDU) sets which has a dependency relationship among PDU sets.

3.2.3 multi-modality communication: A kind of communication service with multi-type traffic flows, e.g., audio traffic, video traffic, sensor traffic, haptic senses, etc.

3.2.4 multi-modality communication policy: A traffic coordination policy applied to user equipment (UE) or UE groups.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

API	Application Programming Interface
CEF	Capability Exposure Function
DNN	Data Network Name
GOP	Group of Pictures
IMT	International Mobile Telecommunications
IP	Internet Protocol
NF	Network Function
PCF	Policy Control Function
PDU	Protocol Data Unit
QoS	Quality of Service
RAN	Radio Access Network
RP	Reference Point
SMF	Session Management Function
UE	User Equipment
UPF	User Plane Function
USM	Unified Subscription Management function

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 "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

Multi-modality communication services require a network for ultra-low latency, high reliability and security to ensure multi-modality interactions. Typical network services are video, audio, sensor information and haptic senses. Multi-modality communication has been widely used in various scenarios, e.g., remote human interaction, tele-operation, social network of robots, and industry and commercial Internet of things (IoT) services.

IMT-2020 network is supposed to support multi-modality communication services. To ensure guaranteed latency, reliability and time synchronization, the IMT-2020 network is required to update protocols, signalling flow and mechanisms to support guaranteed latency and reliability, parallel information synchronization, and coordination of traffic processing between two or more traffic flows of one terminal, and two or more traffic flows of two or more terminals.

7 Features and principle for multi-modality communication

Figure 7-1 shows the architectural concept of the multi-modality communication core network functions (NFs) API and management system which includes IMT-2020 core network functions [ITU-T Y.3100], and network management. It also shows the relationship between core network functions and third-party applications.

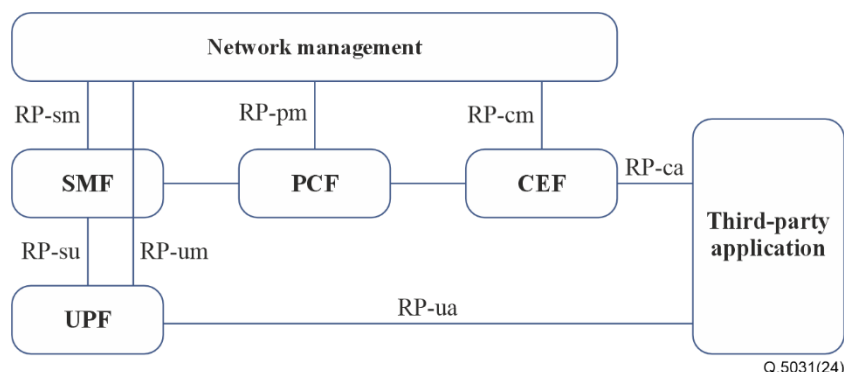


Figure 7-1 – Signalling architecture of multi-modality communication API system

The third-party applications can provide multi-modality service policy and group information to IMT-2020 core network.

The RP-sm, RP-pm, RP-cm, RP-um interface exists between the network management and IMT-2020 core NFs. It supports management and orchestration of NFs, such as performance related data reporting and NFs configuration policies distribution.

The RP-su interface exists between session management function (SMF) and user plane function (UPF). SMF is required to distribute user plane policy which includes multi-modality communication policy and data handling rules through RP-su.

The RP-ca interface exists between the capability exposure function (CEF) and third-party applications. It supports a policy of multi-modality service transmission, which includes but is not limited to multi-modality coordination policy and multi-modality group information which includes multi-modality group ID and UE lists.

The RP-ua reference point exists between the UPF and third-party applications. It supports multi-modality service data transmission.

8 Signalling flow

8.1 Coordination policy information provision of third-party applications

In multi-modality service, flows of UE may need coordinated transmission. Multi-modality policy is used for multiple flows coordination. The third-party applications can provide related information to a policy control function (PCF) to generate multi-modality policy. Figure 8-1 shows the coordination policy information provision of third-party applications procedure.