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Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

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  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
  - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

In the present document, modal verbs have the following meanings:

shall indicates a mandatory requirement to do something

shall not indicates an interdiction (prohibition) to do something

The constructions "shall" and "shall not" are confined to the context of normative provisions, and do not appear in Technical Reports.

The constructions "must" and "must not" are not used as substitutes for "shall" and "shall not". Their use is avoided insofar as possible, and they are not used in a normative context except in a direct citation from an external, referenced, non-3GPP document, or so as to maintain continuity of style when extending or modifying the provisions of such a referenced document.

should indicates a recommendation to do something

should not indicates a recommendation not to do something

may indicates permission to do something

need not indicates permission not to do something

The construction "may not" is ambiguous and is not used in normative elements. The unambiguous constructions "might not" or "shall not" are used instead, depending upon the meaning intended.

can indicates that something is possible

cannot indicates that something is impossible

The constructions "can" and "cannot" are not substitutes for "may" and "need not".

will indicates that something is certain or expected to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

will not indicates that something is certain or expected not to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

might indicates a likelihood that something will happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

might not indicates a likelihood that something will not happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

In addition:

is (or any other verb in the indicative mood) indicates a statement of fact

is not (or any other negative verb in the indicative mood) indicates a statement of fact

The constructions "is" and "is not" do not indicate requirements.

1 Scope

The present document specifies the stage 3 protocol and data model for the Nmf Service Based Interface. It provides stage 3 protocol definitions and message flows, and specifies the API for each service offered by the Media Function (MF).

The 5G System stage 2 architecture and procedures are specified in 3GPP TS 23.501 [2] and 3GPP TS 23.502 [3].

The IP Multimedia Subsystem (IMS) Data Channel (DC) architecture and procedures are specified in annex AC of 3GPP TS 23.228 [14].

The Technical Realization of the Service Based Architecture and the Principles and Guidelines for Services Definition are specified in 3GPP TS 29.500 [4] and 3GPP TS 29.501 [5].

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.501: "System Architecture for the 5G System; Stage 2".

[3] 3GPP TS 23.502: "Procedures for the 5G System; Stage 2".

[4] 3GPP TS 29.500: "5G System; Technical Realization of Service Based Architecture; Stage 3".

[5] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".

[6] OpenAPI: "OpenAPI Specification Version 3.0.0", https://spec.openapis.org/oas/v3.0.0.

[7] 3GPP TR 21.900: "Technical Specification Group working methods".

[8] 3GPP TS 33.501: "Security architecture and procedures for 5G system".

[9] IETF RFC 6749: "The OAuth 2.0 Authorization Framework".

[10] 3GPP TS 29.510: "5G System; Network Function Repository Services; Stage 3".

[11] IETF RFC 7540: "Hypertext Transfer Protocol Version 2 (HTTP/2)".

[12] IETF RFC 8259: "The JavaScript Object Notation (JSON) Data Interchange Format".

[13] IETF RFC 7807: "Problem Details for HTTP APIs".

[14] 3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2".

[15] IETF RFC 6902: " JavaScript Object Notation (JSON) Patch".

[16] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces Stage 3".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1], 3GPP TS 23.228 [14] and the following apply. A term defined in the present document or in 3GPP TS 23.228 [14] takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

3.2 Symbols

For the purposes of the present document, the following symbols given in 3GPP TS 23.228 [14] apply:

DC2 Reference point between MF and IMS AS
MDC1 Reference point between MF and DCSF
MDC2 Reference point either MF and DC Application Server or AR Application Server

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1], 3GPP TS 23.228 [14] and the following apply. An abbreviation defined in the present document or 3GPP TS 23.228 [14] takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

AR Augmented Reality
DTLS Datagram Transport Layer Security
MF Media Function
IMS AS IP Multimedia Subsystem Application Server

4 Overview

Within the IMS DC architecture, the MF offers services to the IMS AS via the Nmf service based interface (see 3GPP TS 23.228 [14]).

Figure 4.1-1 provides the reference model (in service-based interface representation and in reference point representation), with focus on the MF services.

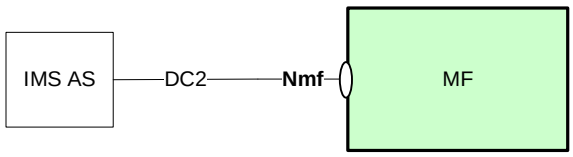

Figure 4.1-1: Reference model – MF

DC2 is the reference point between MF and IMS AS.

5 Services offered by the MF

5.1 Introduction

The MF offers the following services via the Nmf interface:

- Nmf_MediaResourceManagement (MRM) Service

Table 5.1-1 summarizes the corresponding APIs defined for this specification.

Table 5.1-1: API Descriptions

Service Name	Clause	Description	OpenAPI Specification File	apiName	Annex
Nmf_MRM	6.1	Nmf Media Resource Management Service	TS29176_Nmf_MRM.yaml	nmf-mrm	A.2

5.2 Nmf_MediaResourceManagement (MRM) Service

5.2.1 Service Description

The Nmf_MRM service as defined in 3GPP TS 23.228 [14] is provided by the Media Function (MF). This service enables the consumer to create, update and delete media resources. Data Channel (DC) and Augmented Reality (AR) are two capabilities supported by MF.

The media resource represents a media context including one or multiple media terminations. A media termination includes media resources for one or multiple medias on the Mb interface. When a media pass through the MF, there is one termination for the input stream and one termination for the output stream.

5.2.2 Service Operations

5.2.2.1 Introduction

The Nmf_MRM service supports the following service operation.

Table 5.2.2.1-1: Service operations supported by the Nmf_MRM service

Service Operations	Description	Operation Semantics	Example Consumer(s)
Create	Create a new media context including one or multiple media terminations.	Request/Response	IMS AS
Update	Update the one or multiple existing media resources within a specific media context.	Request/Response	IMS AS
Delete	Delete a specific media context including all the existing terminations and medias.	Request/Response	IMS AS

5.2.2.2 Nmf_MRM_Create Service Operation

5.2.2.2.1 General

The Nmf_MRM_Create service operation is used by an NF service consumer to create a media context including one or multiple terminations and reserve media resources for anchoring one or multiple medias of Mb interface in each

termination on MF. The consumer NF may also include application function (e.g. DCSF, DC AS) specification information requested by the application layer to be applied on the media by the MF.

5.2.2.2.2 Creation of a new media context

The NF service consumer shall request a new context by using HTTP method POST with "{apiRoot}/nmf/<apiVersion>/contexts" as resource URI representing the "Contexts Collection", see clause 6.1.3.2.

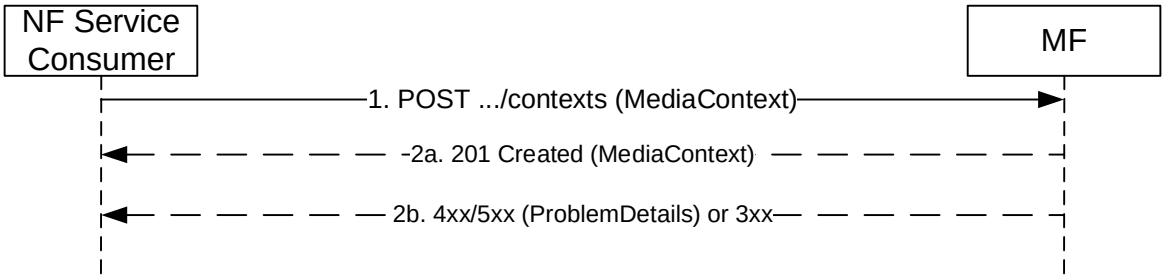

Figure 5.2.2.2.2-1 Creation of a media context

1. The NF Service Consumer shall send a POST request to create an "Individual Context" resource in the MF. The payload body of the POST request shall contain a representation of the individual context resource to be created.

   The NF service consumer shall include list of termination descriptors in the HTTP message body. Each termination descriptor shall include list of media stream descriptors. Each media stream descriptor shall include:

   - Media ID, i.e. a unique identity of the media stream within the media context instance;
   - Remote Mb specifications, i.e. the media stream IP address and port allocated at the remote endpoint, i.e. remote UE, remote network.
   - Media resource description, which includes

     1) Media resource type, e.g. DC, AR.
     2) If media resource type is set to "DC", the DC media specification shall be included. The DC media specification shall include:

        a) Data Channel Mapping and Configuration information when originating/terminating data channel media flows on the Mb interface. It shall include the SCTP stream Id for the DC, and may include subprotocol, order, maxRetry, maxTime and priority may be included.

        b) Maximum Message Size, which represents the maximum size to be expected.

        c) Data Channel Port, which represents the port of SCTP port for the Data Channel.

        d) Security Setup, which identifies the security setup of the DTLS connection.

        e) Security Certificate Fingerprint, which identifies the security certificate fingerprint.

        f Security Transport Identity, which identifies transport layer identity.

        For establishing bootstrap data channel or P2A/A2P application data channel, the following parameters shall be included:

        a) media proxy configuration applicable to the media flow;

        b) remote MDC1/MDC2 media specification information to be applied on the media by the MF;

        c) Replacement HTTP URL for each streamId allocated by the application layer representing the application list (e.g. graphical user interface) offered to the IMS subscriber via the MDC1 interface.