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TECHNICAL SPECIFICATION

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Messaging Framework Adaptor Services;
Stage 3
(3GPP TS 29.576 version 19.6.0 Release 19)**



Reference

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Keywords

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Foreword

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

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

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- 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.

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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.

Introduction

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1 Scope

The present document specifies the stage 3 protocol and data model for the MFAF Service Based Interface. It provides stage 3 protocol definitions and message flows, and specifies the API for each service offered by the MFAF.

The 5G System stage 2 architecture and procedures are specified in 3GPP TS 23.501 [2] and 3GPP TS 23.502 [3]. The stage 2 definition and procedures of Messaging Framework Adaptation are contained in 3GPP TS 23.288 [14] and 3GPP TS 23.502 [3].

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 3.0.0 Specification", <https://github.com/OAI/OpenAPI-Specification/blob/master/versions/3.0.0.md>.
- [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 9113: "HTTP/2".
- [12] IETF RFC 8259: "The JavaScript Object Notation (JSON) Data Interchange Format".
- [13] IETF RFC 9457: "Problem Details for HTTP APIs".
- [14] 3GPP TS 23.288: "Architecture enhancements for 5G System (5GS) to support network data analytics services"
- [15] 3GPP TS 29.574: "5G System; Data Collection Coordination Services; Stage 3".
- [16] Void.
- [17] Void.
- [18] Void.

- [19] Void.
- [20] 3GPP TS 29.520: "5G System; Network Data Analytics Services; Stage 3".
- [21] Void.
- [22] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".
- [23] 3GPP TS 29.575: "5G System; 5G System; Analytics Data Repository Services; 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] and the following apply. A term defined in the present document 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 apply:

3.3 Abbreviations

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

ADRF	Analytics Data Repository Function
AF	Application Function
AMF	Access and Mobility Management Function
DCCF	Data Collection Coordination Function
LMF	Location Management Function
MFAF	Messaging Framework Adaptor Function
NEF	Network Exposure Function
NF	Network Function
NRF	Network Repository Function
NSSF	Network Slice Selection Function
NWDAF	Network Data Analytics Function
PCF	Policy Control Function
SCP	Service Communication Proxy
SMF	Session Management Function
UDM	Unified Data Management

4 Services offered by the MFAF

4.1 Introduction

The Messaging Framework Adaptor Services are used for the Messaging Framework Adaptor Function (MFAF) to enable the 5GS to interact with the messaging framework using Nmfaf services. The MFAF offers other NFs the following services:

- Nmfaf_3daDataManagement;
- Nmfaf_3caDataManagement; and

- Nmfaf_ContextManagement.

Table 4.1-1: Service provided by MFAF

Service Name	Description	Service Operations	Operation Semantics	Example Consumer(s)
Nmfaf_3daDataManagement	The 3GPP DCCF Adaptor (3DA) Data Management Service enables the NF service consumer to convey to the messaging framework information related to the data or analytics that the messaging framework will receive and deliver.	Configure	Request / Response	DCCF, NWDAF
		Deconfigure	Request / Response	DCCF, NWDAF
Nmfaf_3caDataManagement	The 3GPP Consumer Adaptor (3CA) Data Management Service is used to deliver data or analytics.	Notify	Subscribe / Notify	NWDAF, PCF, NSSF, AMF, SMF, NEF, AF, ADRF, LMF, SCP, NRF, UDM
		Fetch	Request / Response	NWDAF, PCF, NSSF, AMF, SMF, NEF, AF, ADRF, LMF, SCP, NRF, UDM
Nmfaf_ContextManagement	The MFAF Context Management service enables the transfer of configurations between MFAFs.	Transfer	Request / Response	MFAF

Table 4.1-2 summarizes the corresponding APIs defined for this specification.

Table 4.1-2: API Descriptions

Service Name	Clause	Description	OpenAPI Specification File	apiName	Annex
Nmfaf_3daDataManagement	5.1	API for Nmfaf_3daDataManagement	TS29576_Nmfaf_3daDataManagement.yaml	nmfaf-3datamanagement	A.2
Nmfaf_3caDataManagement	5.2	API for Nmfaf_3caDataManagement	TS29576_Nmfaf_3caDataManagement.yaml	nmfaf-3cadatamanagement	A.3
Nmfaf_ContextManagement	5.3	API for Nmfaf_ContextManagement	TS29576_Nmfaf_ContextManagement.yaml	nmfaf-contextmanagement	A.4

4.2 Nmfaf_3daDataManagement Service

4.2.1 Service Description

4.2.1.1 Overview

The Nmfaf_3daDataManagement service as defined in 3GPP TS 23.288 [14], is provided by the Messaging Framework Adaptor Function (MFAF).

This service:

- allows NF consumers to configure or reconfigure the MFAF; and

- allows NF consumers to remove configurations from the MFAF.

4.2.1.2 Service Architecture

The 5G System Architecture is defined in 3GPP TS 23.501 [2]. The Network Data Analytics Exposure architecture is defined in 3GPP TS 23.288 [14].

The Nmfaf_3daDataManagement service is part of the Nmfaf service-based interface exhibited by the Messaging Framework Adaptor Function (MFAF).

Known consumer of the Nmfaf_3daDataManagement service is:

- Data Collection Coordination Function (DCCF)

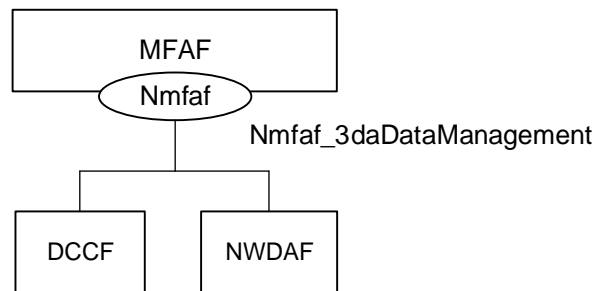


Figure 4.2.1.2-1: Reference Architecture for the Nmfaf_3daDataManagement Service; SBI representation

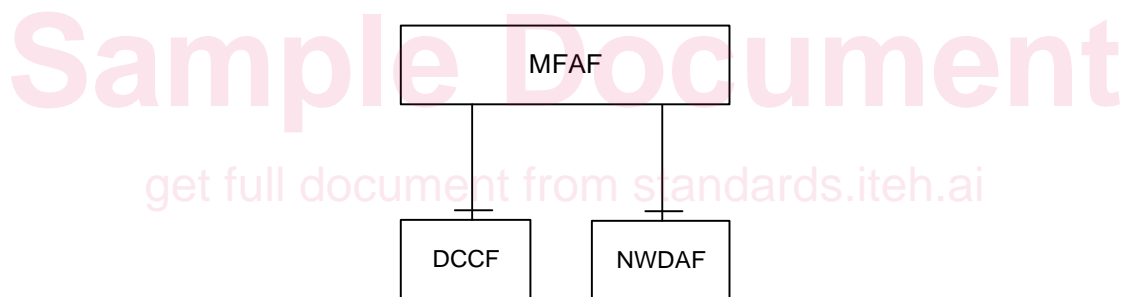


Figure 4.2.1.2-2: Reference Architecture for the Nmfaf_3daDataManagement Service; reference point representation

4.2.1.3 Network Functions

4.2.1.3.1 Messaging Framework Adaptor Function (MFAF)

The Messaging Framework Adaptor Function (MFAF) provides the functionality to allow NF consumers to configure the behaviour of the MFAF.

4.2.1.3.2 NF Service Consumers

The Data Collection Coordination Function (DCCF) and the NWDAF support:

- configuring the MFAF; and
- deconfiguring the MFAF.

4.2.2 Service Operations

4.2.2.1 Introduction

Table 4.2.2.1-1: Operations of the Nmfaf_3daDataManagement Service

Service operation name	Description	Initiated by
Nmfaf_3daDataManagement_Configure	This service operation is used by an NF to configure or reconfigure the MFAF.	NF service consumer (DCCF, NWDAF)
Nmfaf_3daDataManagement_Deconfigure	This service operation is used by an NF to remove configuration(s) from the MFAF.	NF service consumer (DCCF, NWDAF)

4.2.2.2 Nmfaf_3daDataManagement_Configure service operation

4.2.2.2.1 General

The Nmfaf_3daDataManagement_Configure service operation is used by an NF service consumer to configure or update the configuration of the MFAF.

4.2.2.2.2 Initial configuration of the MFAF

Figure 4.2.2.2.2-1 shows a scenario where the NF service consumer (e.g. DCCF) sends a request to the MFAF to request an MFAF configuration.

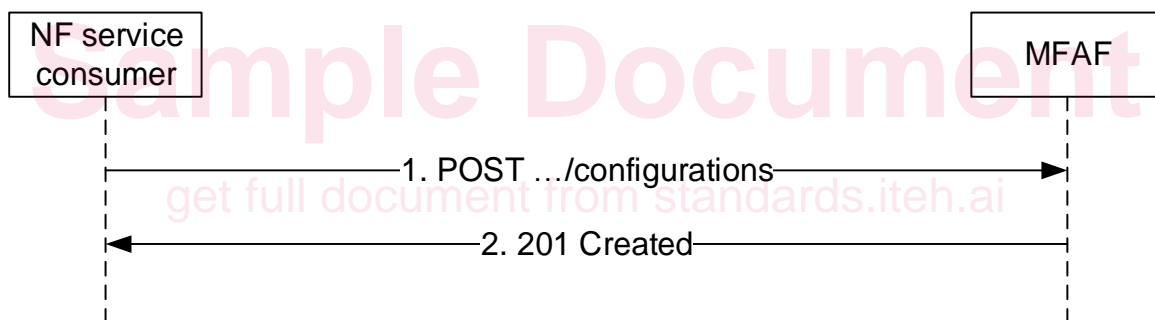


Figure 4.2.2.2.2-1: NF service consumer create the configuration

The NF service consumer shall invoke the Nmfaf_3daDataManagement_Configure service operation to create the configuration(s). The NF service consumer shall send an HTTP POST request with "{apiRoot}/nmfaf-3dadatamanagement/<apiVersion>/configurations" as Resource URI representing the "MFAF Configurations", as shown in figure 4.2.2.2.2-1, step 1, to create a configuration for an "Individual MFAF Configuration" according to the information in message body. The MfafConfiguration data structure provided in the request body

shall include one of the following:

- MFAF transfer information within the "mfafTransferInfo" attribute, if the MfafTransfer feature is supported.
- a description of the configurations as "messageConfigurations" attribute that, for each configuration, the MessageConfiguration data type shall include
 - 1) a notification URI of Data Consumer or Analytics Consumer or other endpoint where to receive the requested mapping data or analytics as "notificationURI" attribute; and
 - 2)- if the configuration is used for mapping analytics or data collection, a Notification Correlation ID for the Data or Analytics Consumer (or other endpoint) as "correId" attribute;

and may include:

- 1) the formatting instructions as "formatInstruct" attribute;

- 2) the processing instructions as "procInstruct" attribute or "multiProcInstructs" attribute if the "MultiProcessingInstruction" feature is supported;
- 3) the MFAF notification information to identify the Event Notifications received from the NWDAF or Data Source NF (e.g. AMF, SMF), which can be sent to the consumer or other notification endpoints, as "mfafNotiInfo" attribute;
- 4) NF instance identifier of the ADRF as "adrfId" attribute; and
- 5) the notification endpoints within the "notifEndpoints" attribute, if the "DataAnaCollect" feature is supported.

Upon the reception of an HTTP POST request with: "{apiRoot}/nmfaf-3datamanagement/<apiVersion>/configurations" as Resource URI and MfafConfiguration data structure as request body, the MFAF shall:

- create a new configuration;
- assign a transaction reference id;
- if the request was for providing message configurations and no MFAF notification information has been provided in the request, determine the MFAF notification information and add it to the configuration that is created and will be returned to the NF service consumer;
- if the request was for triggering MFAF configuration transfer, the MFAF shall execute the transfer invoking the Nmfaf_ContextManagement_Transfer service operation as defined in clause 4.4.2.2;
- store the configuration.

If the MFAF created an "Individual MFAF Configuration" resource, the MFAF shall respond with "201 Created" with the message body containing a representation of the created configuration, as shown in figure 4.2.2.2.2-1, step 2.

If an error occurs when processing the HTTP POST request, the MFAF shall send an HTTP error response as specified in clause 5.1.7.

4.2.2.2.3 Update the configuration of the MFAF

Figure 4.2.2.2.3-1 shows a scenario where the NF service consumer sends a request to the MFAF to update a configuration (as shown in 3GPP TS 23.288 [14])

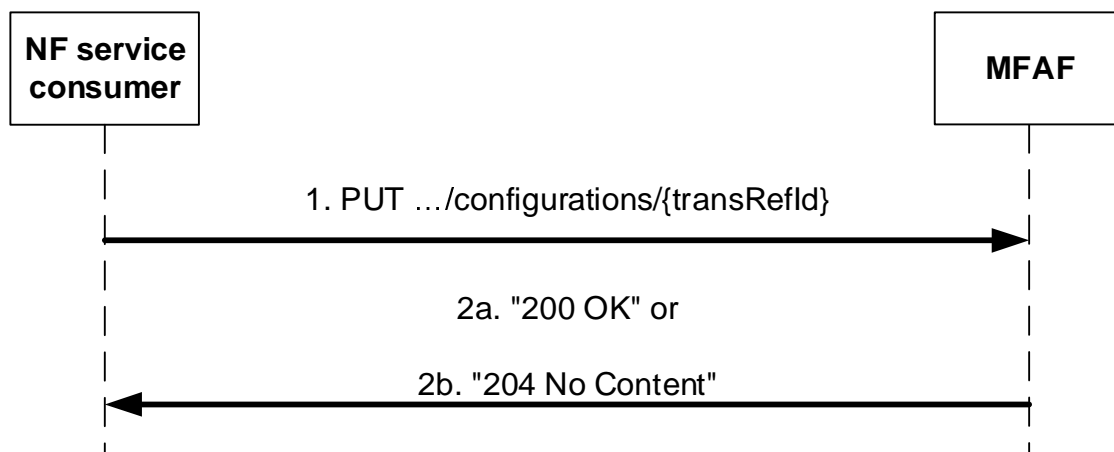


Figure 4.2.2.2.3-1: NF service consumer updates configuration

The NF service consumer shall invoke the Nmfaf_3daDataManagement_Configure service operation to update the configuration(s). The NF service consumer shall send an HTTP PUT request with "{apiRoot}/nmfaf-3datamanagement/<apiVersion>/configurations/{transRefId}" as Resource URI representing the "Individual MFAF Configuration", as shown in figure 4.2.2.2.3-1, step 1, to update an "Individual MFAF Configuration" resource identified by the {transRefId}. This service operation shall not be performed on an "Individual MFAF Configuration" that contains the "mfafTransferInfo" attribute. The MfafConfiguration data structure provided in the request body shall