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TECHNICAL SPECIFICATION

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# Contents

# Foreword

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**shall not** indicates an interdiction (prohibition) to do something

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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.

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**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

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**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 MMTel Enabler Server services, enabling the support of MMTel applications and services over 3GPP networks. It provides stage 3 protocol definitions and message flows, and specifies the API of each service offered by the MMTel Enabler Server over the MMTel-2/3 interface. The stage 2 application layer architecture, functional requirements, procedures and information flows necessary for MMTel Service are contained in 3GPP TS 23.392 [2].

The stage 2 application layer architecture for MMTel, functional requirements, procedures and information flows necessary for enabling MMTel applications over 3GPP networks are specified in 3GPP TS 23.392 [6].

The common protocol and interface aspects for API definition are specified in clause 5.2 of 3GPP TS 29.122 [2].

# 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 29.122: "T8 reference point for Northbound Application Programming Interfaces (APIs)".

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

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

[5] 3GPP TR 21.900: "Technical Specification Group working methods".

[6] 3GPP TS 23.392: "Application enablement aspects for MMTel".

[7] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".

[8] 3GPP TS 23.222: "Common API Framework for 3GPP Northbound APIs; Stage 2".

[9] 3GPP TS 29.222: "Common API Framework for 3GPP Northbound APIs; Stage 3".

[10] 3GPP TS 33.122: "Security aspects of Common API Framework (CAPIF) for 3GPP northbound APIs".

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

[12] 3GPP TS 29.500: "5G System; Technical Realization of Service Based Architecture; Stage 3".

[13] 3GPP TS 29.175: "IP Multimedia Subsystem (IMS) Application Server (AS) Services Stage 3".

[14] 3GPP TS 29.522: "5G System; Network Exposure Function Northbound APIs; Stage 3".

[15] OMA-TS-REST_NetAPI_ThirdPartyCall-V1_0-20130212-C: "RESTful Network API Framework for Third Party Call ".

# 3 Definitions of terms, 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].

For the purpose of the present document, the terms and definitions given in clause 3 of 3GPP TS 23.392 [6] also apply, including the ones referencing other specifications.

## 3.2 Symbols

Void

## 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].

# 4 Overview

3GPP TS 23.392 [6] has specified the application layer architecture, architectural requirements, procedures, information flows, in order to support the Application enablement for MMTel Service, mainly including DC Application management, DC Application downloading control, MMTel service usage and Multiple call control handling.

The present document specifies the APIs needed to support MMTel Services for interworking between the MMTel Enabler Server and the Controlling Application Server or Application Server, including the following functionalities:

1. Server-side functionality with the DC application configuration, update, deletion and information query, provided by the MMTel Enabler Server over the MMTel-2 interface.

2. Server-side functionality to provide capabilities to application providers/Vertical service providers to use MMTel services over the MMTel-3 interface.

Figure 4-1 shows the reference model of the MMTel Application Enabler Layer, with a focus on the MMTel Enabler Server:

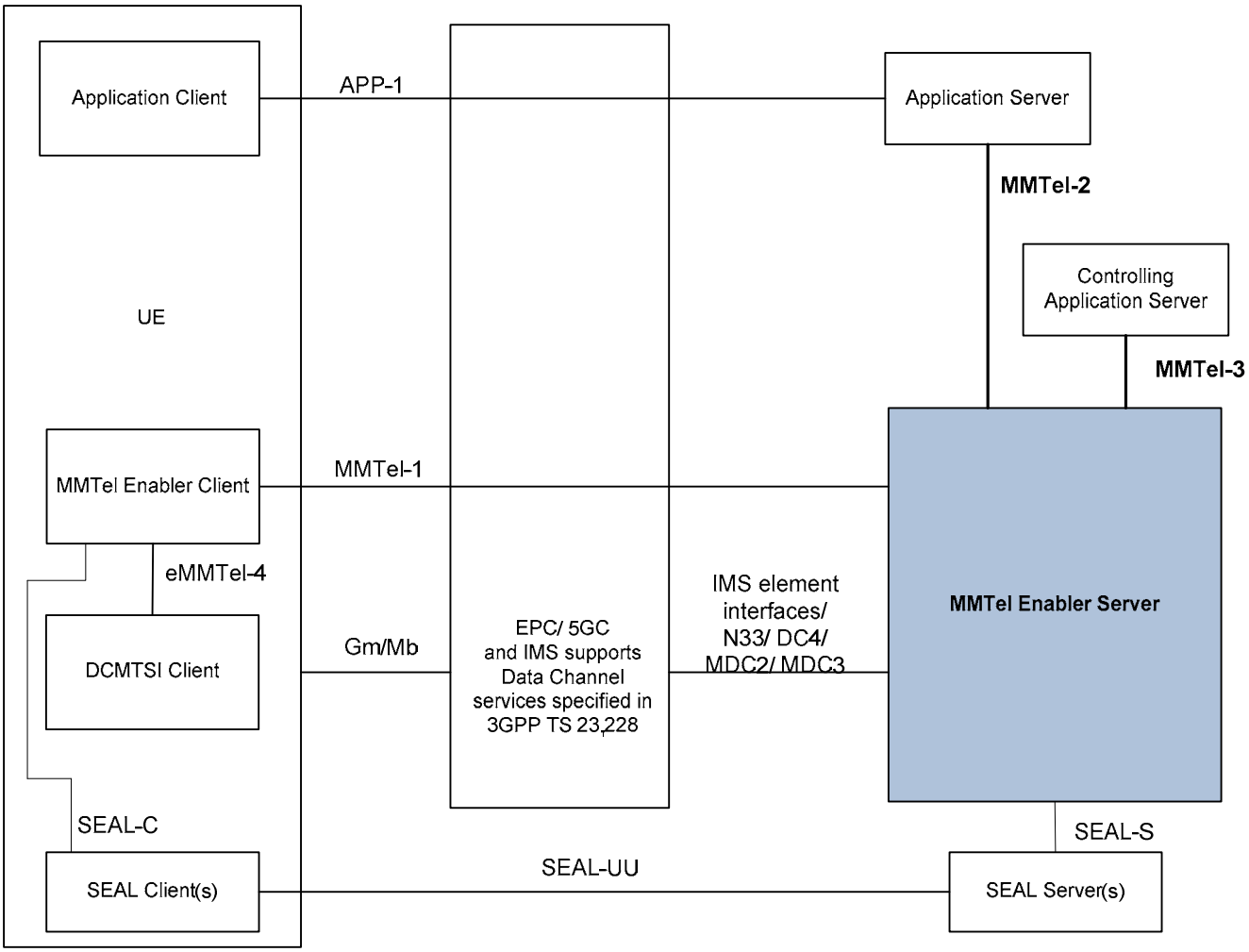


**Figure 4-1: MMTel Application Enabler Layer functional model**

# 5 Services offered by the MMTel Enabler Server

## 5.1 Introduction

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 | API Name | Annex |
|---|---|---|---|---|---|
| MMTel_DCAppManagement Service | 6.1 | MMTel DC Application Management Service | TS29392_MMTel_DCAppManagement.yaml | mmtel-dcappmgmt | A.2 |
| MMTel_DCAppCall Service | 6.2 | MMTel DC Application Call Service | TS29392_MMTel_DCAppCall.yaml | mmtel-dcappcall | A.3 |
| MMTel_CallEvent Service | 6.3 | MMTel Enabler Server Call Event Service. | TS29392_MMTel_CallEvent.yaml | mmtel-callevent | A.4 |
| MMTel_CallControl Service | 6.4 | MMTel Call Control Service | TS29392_MMTel_CallControl.yaml | mmtel-callcontrol | A.5 |

NOTE: When 3GPP TS 29.122 [2] is referenced for the common protocol and interface aspects for API definition in this document, the MMTel Server) takes the role of the SCEF and the service consumer takes the role of the SCS/AS.

## 5.2 MMTel_DCAppManagement Service

### 5.2.1 Service Description

The MMTel_DCAppManagement Service as defined in clause 8.2 in 3GPP TS 23.392 [6], is provided by the MMTel Enabler Server.

This service:

- allows Controlling Application Server invokes services provided by a MMTel Enabler Server to config DC application and profile to the MMTel Enabler Server;
- allows Controlling Application Server invokes services provided by a MMTel Enabler Server to update DC application and profile to the MMTel Enabler Server.
- allows Controlling Application Server invokes services provided by a MMTel Enabler Server to delete DC application.
- allows Controlling Application Server invokes services provided by a MMTel Enabler Server to obtain detail DC application profile information on the MMTel Enabler Server.

### 5.2.2 Service Operations

#### 5.2.2.1 Introduction

The service operations defined for MMTel_DCAppManagement Service is shown in the table 5.2.2.1-1

**Table 5.2.2.1-1: Operations of the MMTel_DCAppManagement Service**

| Service operation name | Description | Initiated by |
|---|---|---|
| MMTel_DCAppManagement_Configure | This service operation is used by the service consumer to configure DC application and profile to the MMTel Enabler Server. | e.g., Controlling Application Server |
| MMTel_DCAppManagement_Update | This service operation is used by Controlling Application Server to update an existing DC application profile information or DC application. | e.g., Controlling Application Server |
| MMTel_DCAppManagement_Delete | This service operation is used by the service consumer to delete an existing DC application. | e.g., Controlling Application Server |
| MMTel_DCAppManagement_Retrieval | This service operation is used by the service consumer to retrieve the details of an existing DC application profile information. | e.g., Controlling Application Server |

### 5.2.2.2 MMTel_DCAppManagement_Configure

#### 5.2.2.2.1 General

This service operation is used by the service consumer to configure DC application and profile to the MMTel Enabler Server.

The following procedures are supported by the "MMTel_DCAppManagement_Configure" service operation:

- DC Application and Profile Configuration.

#### 5.2.2.2.2 DC Application and Profile Configuration

Figure 5.2.2.2.2-1 depicts a scenario where a Controlling Application Server sends a request to the MMTel Enabler Server to configure DC application and profile (see also clause 8.2.2 of 3GPP TS 23.392 [6]).

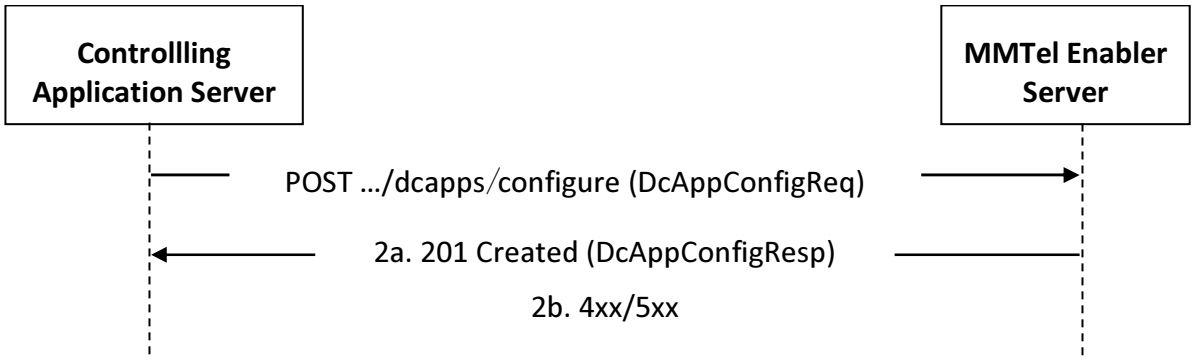


**Figure 5.2.2.2.2-1: Procedure for DC Application and Profile Configuration**

1. In order to configure DC application and profile, the Controlling Application Server shall send an HTTP POST request (i.e., custom operation "Configure") to the MMTel Enabler Server targeting the "DC APP" collection resource, with the request body including the DcAppConfigReq data structure.

2a. Upon success, the MMTel Enabler Server shall respond with an HTTP "201 Created" status code with the response body containing a representation of the created "DC APP" resource and potentially additional information within the DcAppConfigResp data structure.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.1.7.

### 5.2.2.3 MMTel_DCAppManagement_Update

#### 5.2.2.3.1 General

This service operation is used by Controlling Application Server to update an existing DC application profile information or DC application at the MMTel Enabler Server.

The following procedures are supported by the "MMTel_DCAppManagement_Configure" service operation:

- DC Application and Profile Update.

#### 5.2.2.3.2 DC Application and Profile Update

Figure 5.2.2.3.2-1 depicts a scenario where a Controlling Application Server sends a request to the MMTel Enabler Server to update existing DC application and profile (see also clause 8.2.3 of 3GPP TS 23.392 [6]).

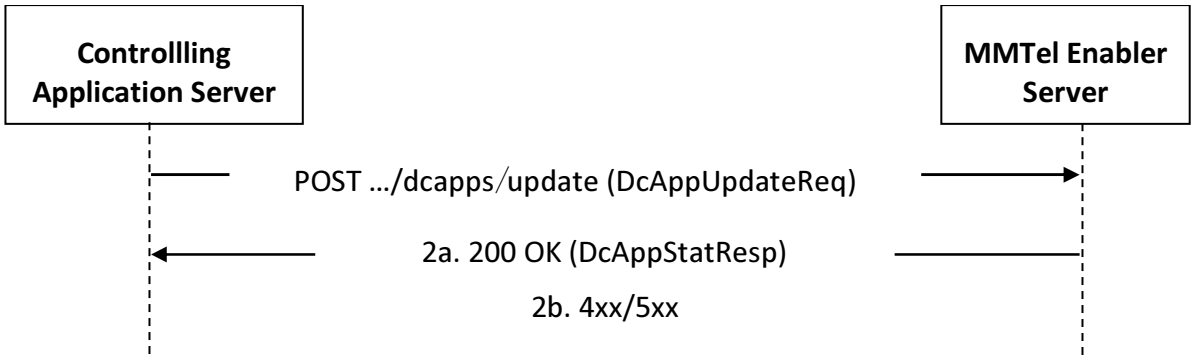


**Figure 5.2.2.3.2-1: Procedure for DC Application and Profile Update**

1. In order to update existing DC application or DC application profile related information, the Controlling Application Server shall send an HTTP POST request (i.e., custom operation "Update") to the MMTel Enabler Server targeting the corresponding "DC APP" resource, with the request body including the DcAppUpdateReq data structure.

2a. Upon success, the MMTel Enabler Server shall respond with an HTTP "200 OK" status code with the response body containing a representation of the updated "DC APP" resource within the DcAppStatResp data structure.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.1.7.

### 5.2.2.4 MMTel_DCAppManagement_Delete

#### 5.2.2.4.1 General

This service operation is used by the service consumer to delete an existing DC application at the MMTel Enabler Server.

The following procedures are supported by the "MMTel_DCAppManagement_Configure" service operation:

- DC Application and Profile Deletion.

#### 5.2.2.4.2 DC Application and Profile Deletion

Figure 5.2.2.4.2-1 depicts a scenario where a Controlling Application Server sends a request to the MMTel Enabler Server to delete existing DC application and profile (see also clause 8.2.4 of 3GPP TS 23.392 [6]).

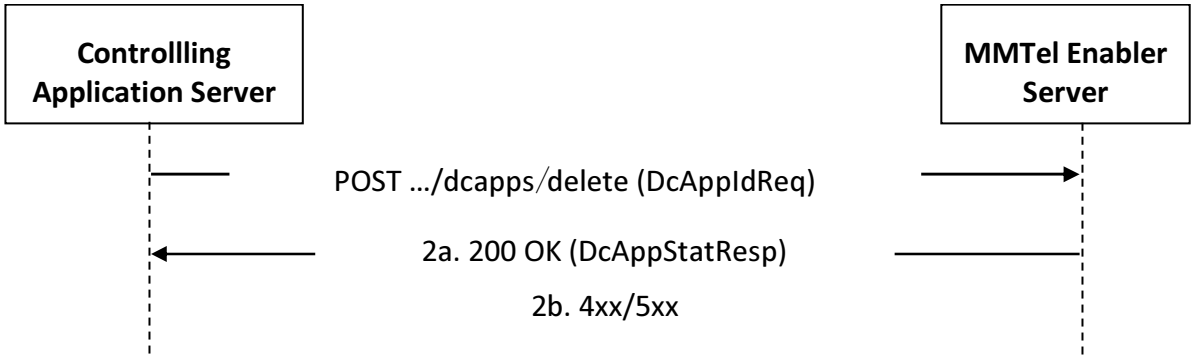


**Figure 5.2.2.4.2-1: Procedure for DC Application and Profile Deletion**

1. In order to configure DC application and profile, the Controlling Application Server shall send an HTTP POST request (i.e., custom operation "Delete") to the MMTel Enabler Server targeting the "DC APP" collection resource, with the request body including the DcAppIdReq data structure;
2. Upon success, the MMTel Enabler Server shall respond with an HTTP "200 OK" status code with the response body containing a representation of the updated "DC APP" resource within the DcAppStatResp data structure.
3. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.1.7.

### 5.2.2.5 MMTel_DCAppManagement_Retrieval

#### 5.2.2.5.1 General

This service operation is used by the service consumer to retrieve the details of an existing DC application profile information at the MMTel Enabler Server.

The following procedures are supported by the "MMTel_DCAppManagement_Configure" service operation:

- DC Application and Profile Retrieval.

#### 5.2.2.5.2 DC Application and Profile Retrieval

Figure 5.2.2.5.2-1 depicts a scenario where a Controlling Application Server sends a request to the MMTel Enabler Server to retrieve DC application profile related information (see also clause 8.2.5 of 3GPP TS 23.392 [6]).

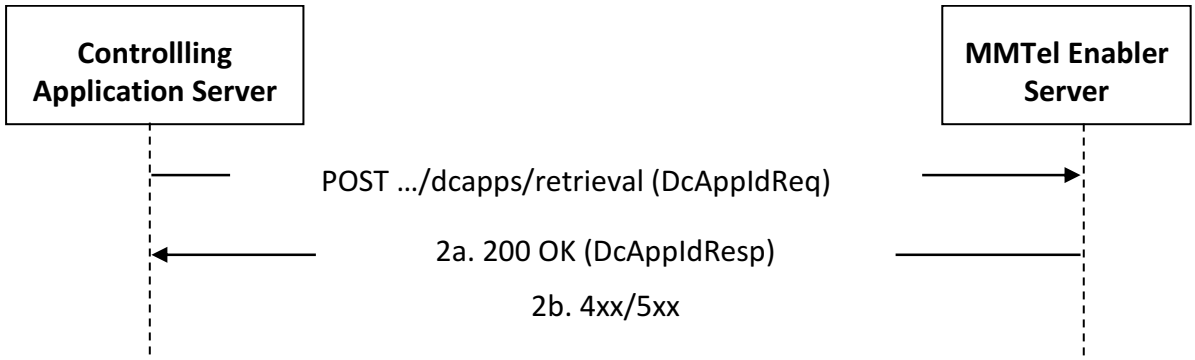


**Figure 5.2.2.5.2-1: Procedure for DC Application and Profile Retrieval**

1. In order to retrieve existing DC application profile related information, the Controlling Application Server shall send an HTTP POST request(i.e., custom operation "Retrieval") to the MMTel Enabler Server targeting the "DC APP" collection resource, with the request body including the DcAppIdReq data structure.
2. Upon success, the MMTel Enabler Server shall respond with an HTTP "200 OK" status code with the response body containing a representation of the retrievaled "DC APP" resource within the DcAppIdResp data structure.

3. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP GET response body, as specified in clause 6.1.7.

# 5.3 MMTel_DCAppCall Service

## 5.3.1 Service Description

The MMTel_ DCAppCall Service as defined in clause 8.4 in 3GPP TS 23.392 [2], is provided by the MMTel Enabler Server.

This service:

- allows Application Server invokes the service provided by a MMTel Enabler Server to establish a Third-Party Call with Data Channel capability;
- allows Application Server invokes services provided by a MMTel Enabler Server to add an A2P Data Channel to an existing IMS session for establishment of an Application Call with Data Channel capability.
- allows the MMTel Enabler Server to notify to the Application Server about DC resource information.

## 5.3.2 Service Operations

### 5.3.2.1 Introduction

The service operation defined for MMTel_DCAppCall API is shown in the table 5.3.2.1-1.

**Table 5.3.2.1-1: Operations of the MMTel_DCAppCall API**

| Service operation name | Description | Initiated by |
|---|---|---|
| MMTel_DCAppCall_DCThirdPartyCall Req | The service operation is used by the service consumer to request to establish a Third-Party Call with Data Channel capability | Application Server |
| MMTel_DCAppCall_UpdateDCMedia | The service operation is used by the service consumer to request to add an A2P Data Channel media to an existing IMS session. | Application Server |
| MMTel_DCAppCall_Notify | The service operation is used by the MMTel Enabler Server to notify the service consumer about any update of DC resource information. | MMTel Enabler Server |

### 5.3.2.2 MMTel_DCAppCall_DCCallReq

#### 5.3.2.2.1 General

This service operation is used by the Application Server to request the MMTel Enabler Server to establish a call with Data Channel capability. It supports two scenarios:

- Application Call Scenario: A non-IMS application initiates a call with a single UE, specified in 3GPP TS 23.392 [6] clause 8.4.2;
- Third-Party Call Scenario: Application Server triggers a call between two UEs, specified in 3GPP TS 23.392 [6] clause 8.4.3.

The following procedures are supported by the "MMTel_DCAppCall_DCCallReq" service operation:

- allows Application Server invokes the service provided by a MMTel Enabler Server to establish a Data Channel capability enabled call;
- allows Application Server invokes services provided by a MMTel Enabler Server to add an A2P Data Channel to an existing IMS session for establishment of a Data Channel capability enabled call;
- allows the MMTel Enabler Server to notify to the Application Server about DC resource information.

#### 5.3.2.2.2 DC Call Establishment

Figure 5.3.2.2.2-1 depicts a scenario where an Application Server sends a request to the MMTel Enabler Server to establish a Data Channel capability enabled call.


**Figure 5.3.2.2.2-1: Procedure for DC Call Establishment**

To establish a call with Data Channel capability, the Application Server shall send an HTTP POST request to the MMTel Enabler Server as specified in clause clause 8.4.2.2 or clause 8.4.3.2 of 3GPP TS 23.392 [6] with the request body including the DCCallReq data structure as specified in clause 8.4.3.3.1 of 3GPP TS 23.392 [6].

Upon reception of the HTTP POST request from the Application Server, the MMTel Enabler Server shall:

1. Verify the Application Server's identity and authorization (including verifying additional OMA Third-Party Call API authorization);
2. if the Application Server is authorized to establish a DC call, the MMTel Enabler Server respond with an HTTP "200 OK " status code with the response body including the DCCallResp data structure as specified in clause 6.2.4.3 of 3GPP TS 23.392 [6].
3. On failure, the appropriate HTTP status code indicating the error shall be returned as specified in clause 6.2.7

### 5.3.2.3 MMTel_DCAppCall_UpdateMedia

#### 5.3.2.3.1 General

This service operation is used by the Application Server to request the MMTel Enabler Server to add an A2P Data Channel media to an existing IMS session.

#### 5.3.2.3.2 DC Media Update

Figure 5.3.2.3.2-1 depicts the scenario where an Application Server sends a request to the MMTel Enabler Server to add A2P Data Channel media to an existing IMS session.


**Figure 5.3.2.3.2-1: Procedure for DC Media Update**

To add A2P Data Channel media, the Application Server shall send an HTTP POST request to the MMTel Enabler Server as specified in clause 8.4.4 of 3GPP TS 23.392[6], with the request body including the DcMediaUpdateReq data structure.

Upon reception of the HTTP POST request from the Application Server, the MMTel Enabler Server shall:

1. Verify the Application Server's identity and authorization;
2. if the Application Server is authorized, the MMTel Enabler Server respond with an HTTP "200 OK" status code with the response body including DCMediaUpdateResp data structure as defined in clause 6.2.4.2
3. On failure, the appropriate HTTP status code indicating the error shall be returned as specified in clause 6.2.6.

### 5.3.2.4 MMTel_DCAppCall_Notify

#### 5.3.2.4.1 General

This service operation is used by the MMTel Enabler Server to notify the Application Server about DC media information updates.

#### 5.3.2.4.2 DC Media Notification

Figure 5.3.2.4.2-1 depicts a scenario where the MMTel Enabler Server sends a notification to the Application Server about DC resource information (see also clause 8.4.4.1 of 3GPP TS 23.392 [6]).


**Figure 5.3.2.4.2-1: Procedure for DC Media Notification**

1. When DC resource information changes, the MMTel Enabler Server shall send an HTTP POST request to the notification endpoint provided by the Application Server, with the request body containing the updated DC resource information within the DCMediaNotifyReq data structure as defined in clause 6.2.5.
2. The Application Server shall respond with an HTTP "200 OK" status code upon successful receipt of the notification with the response body including DCMediaNotifyResp data structure as defined in clause 6.2.5.
3. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information as specified in clause 6.2.7.

# 5.4 MMTel_CallEvent Service

## 5.4.1 Service Description

The MMTel_CallEvent service enables the consumer to be notified about session events when served IMS subscribers take part in IMS sessions as defined in 3GPP TS 23.392 [6].

## 5.4.2 Service Operations

### 5.4.2.1 Introduction

The service operation defined for MMTel_CallControl API is shown in the Table 5.5.2.1-1.

**Table 5.5.2.1-1: Operations of the MMTel_CallControl API**

| Service operation name | Description | Initiated by |
|---|---|---|
| MMTel_CallEvent_Notify | Notification about call events of a specific Application Server. | Application Server |

NOTE: Explicit subscription to receive session events is another service operation defined in 3GPP TS 23.228[15] which has not specified in this Release. In this Release an implicit subscription is assumed where the MMTel Enabler Server notifies a configured or discovered the Application Server of a call event through a Notify.

### 5.4.2.1A MMTel_CallEvent_Subscribe

This is a pseudo operation, the MMTel Enabler Server does not actually provide Subscribe service operation through MMTel_CallEvent service in this Release. The actual subscription is implicitly subscribed with the CallEventNotificationUri.

### 5.4.2.2 MMTel_CallEvent_Notify

#### 5.4.2.2.1 General

This service operation is used by the MMTel Enabler Server to notify the Application Servers of IMS session events.

#### 5.4.2.2.2 Notification for Session Event

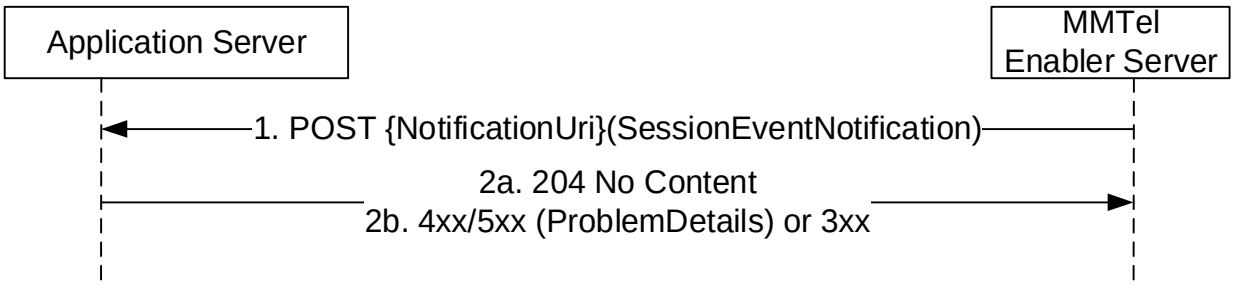


**Figure 5.4.2.2.2-1: Notification for Session Event**

1. If the MMTel Enabler Server receives the IMS session control events of a specific IMS Session, it determines that the events need to be notified to the Application Server, the MMTel Enabler Server shall send a POST request to the SessionEventNotificationUri as specified in clause 6.3.5.4.2.

2a. Upon success, the Application Server responds with "204 No Content".

2b. On failure or redirection:

- The appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.1.6.

- In the case of redirection, the Application Server shall return 3xx status code, which shall contain a Location header with an URI pointing to the endpoint of another Application Server. A RedirectResponse IE may be included in the content of POST response.

# 5.5 MMTel_CallControl Service

## 5.5.1 Service Description

The MMTel_CallControl service enables the Application Server to request MMTel Enabler Server to handle the specific call control logic (e.g. create new call session, terminate call session or call control, etc.) or enables the MMTel Enabler Server to notify the call control results to the Application Server.

## 5.5.2 Service Operations

### 5.5.2.1 Introduction

The service operation defined for MMTel_CallControl API is shown in the Table 5.5.2.1-1.

**Table 5.5.2.1-1: Operations of the MMTel_CallControl API**

| Service operation name | Description | Initiated by |
|---|---|---|
| MMTel_CallControl_Create | This service operation is used by the Application Server to request call control to the MMTel Enabler Server to create an IMS session. | Application Server |
| MMTel_CallControl_Update | This service operation is used by the Application Server to request call control to the MMTel Enabler Server to update an IMS session, e,g. modify the media of the IMS session. | Application Server |
| MMTel_CallControl_Delete | This service operation is used by the Application Server to request call control to the MMTel Enabler Server to delete an IMS session. | Application Server |
| MMTel_CallControl_Notify | This service operation is used by the MMTel Enabler Server to notify the call control results to the Application Server. | MMTel Enabler Server |

### 5.5.2.2 MMTel_CallControl_Create

#### 5.5.2.2.1 General

This service operation is used by the Application Server to request an IMS session creation.

#### 5.5.2.2.2 Creation of a new IMS session

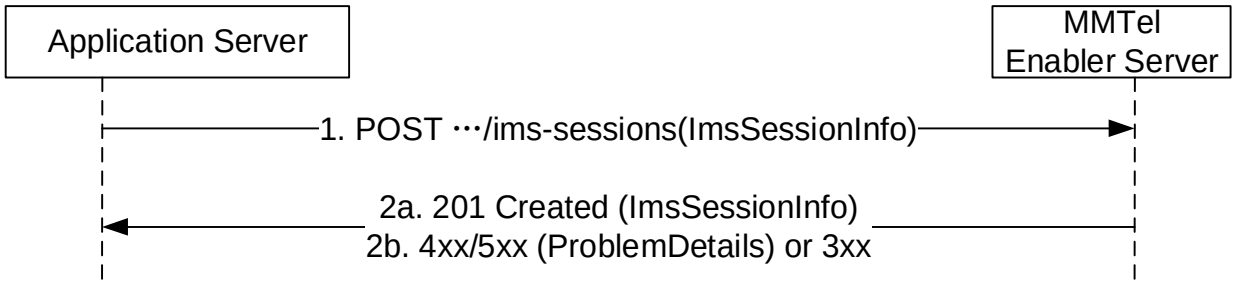


**Figure 5.5.2.2.2-1: Creation of a new IMS session**

1. The Application Server shall send a POST request to create an "Individual IMS Session" resource in the MMTel Enabler Server. The payload body of the POST request shall contain a representation of the individual IMS session resource (ImsSessionInfo) to be created.

   If the "notifUri" and "notifCorrelationId" attributes are included within the "ImsSessionInfo" data type, this request creates an implicit subscription to IMS session event notification related to this session.

2a. Upon the reception of the HTTP POST request, if the request is accepted and no error occur, the MMTel Enabler Server shall create a new session ID for the session and the mediaCorrelationId for each media used in the IMS session.

   The MMTel Enabler Server shall include a HTTP Location header to provide the location of a newly created resource (ImsSessionInfo) together with the status code 201 Created indicating the requested resource is created in the response message.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.4.6.

   On redirection, the MMTel Enabler Server shall include 3xx status code, which shall contain a Location header with an URI pointing to the endpoint to another MMTel Enabler Server (service) instance.

### 5.5.2.3 MMTel_CallControl_Update

#### 5.5.2.3.1 General

This service operation is used by the Application Server to modify the media in a specific IMS session.

#### 5.5.2.3.2 Partial updating an existing IMS session

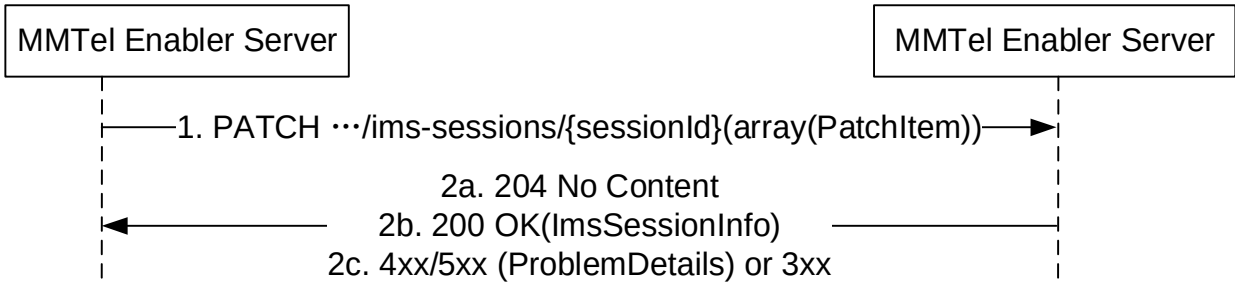


**Figure 5.5.2.3.2-1: Update an IMS session**

1. The Application Server shall send a PATCH request to modify an "Individual IMS Session" resource in the MMTel Enabler Server. The modification may be for adding, updating or deleting a media in the existing IMS session.

   For adding, removing or updating a media in an existing ImsSessionInfo, the payload body of the PATCH request shall contain an "add", "remove" or "replace" PATCH operation respectively, with one item of the attribute "mediaInfoSet" of the ImsSessionInfo. The MMTel Enabler Server shall use the mediaCorrelationId to check whether the operated media exists in the IMS session.

   If the payload of the PATCH request includes the "notifUri" and "notifCorrelationId" within the "ImsSessionInfo" data type, this request creates an implicit subscription to IMS session event notification related to this session.

2a. On success, if the change is to delete the existing media and MMTel Enabler Server accepts the request change, the MMTel Enabler Server shall return the status code 204 No Content.

2b. On success, if the change is to add a new media or to update the existing media within an IMS session and the MMTel Enabler Server accepts the request change, the MMTel Enabler Server shall return the status code 200 OK. The response shall contain the new resource representation of the resource Individual IMS Session, which includes the added and modified resource or its sub-resource.

2c On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.4.6.

On redirection, the MMTel Enabler Server shall return 3xx status code, which shall contain a Location header with an URI pointing to the endpoint to another MMTel Enabler Server (service) instance.

#### 5.5.2.3.3 Updating an existing IMS session

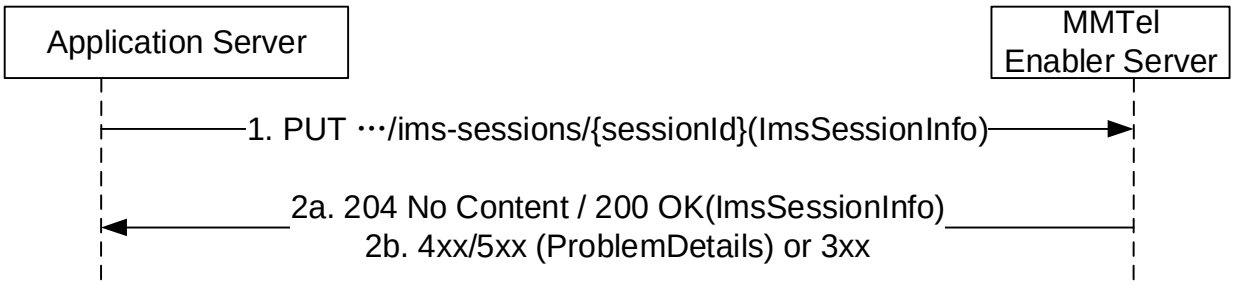


**Figure 5.5.2.3.3-1: Updating an existing IMS session**

1. The Application Server shall send a PUT request with the Resource URI "{apiRoot}/mmtel-callcontrol/<apiVersion>/ims-sessions/{sessionId}" to update an "existing IMS session" resource in the MMTel Enabler Server identified by the {sessionId}.

2a. On success, the MMTel Enabler Server shall return the status code "204 No Content" or "200 OK" with the resource representation of the updated resource Individual Ims Event Subscription.

2b On failure, one of the HTTP status code listed in table 6.4.3.3.3.2-3 indicating the error shall be returned. For a 4xx/5xx response, the message body shall contain a ProblemDetails structure with the "cause" attribute set to one of the application errors listed in table 6.4.3.3.3.2-3.

On redirection, the MMTel Enabler Server shall return 3xx status code, which shall contain a Location header with an URI pointing to the endpoint to another MMTel Enabler Server (service) instance.

### 5.5.2.4 MMTel_CallControl_Delete

#### 5.5.2.4.1 General

This service operation is used by the Application Server to release the specific IMS session.

#### 5.5.2.4.2 Releasing an exisiting IMS Session

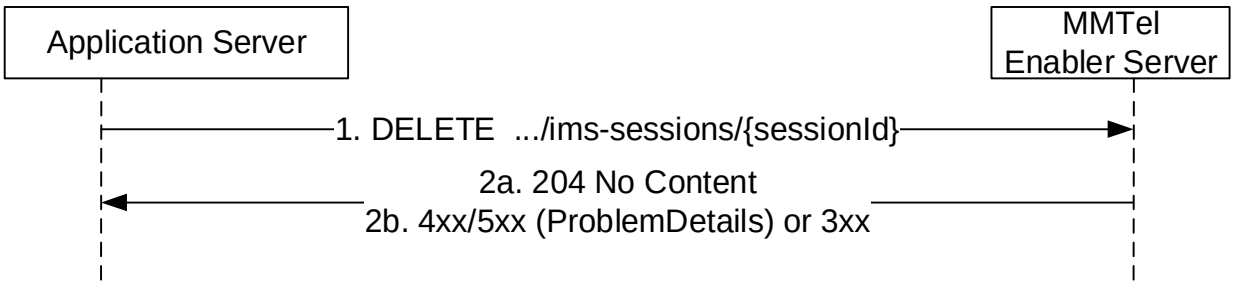


**Figure 5.5.2.4.2-1: Releasing an existing IMS Session**

1. The NF Application Server shall send a DELETE request to delete an existing Individual IMS Session resource in the MMTel Enabler Server.

2a. On success, the request is accepted, the MMTel Enabler Server shall reply with the status code "204 No Content" indicating that the resource identified by sessionId is successfully deleted in the response message.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.4.6.

On redirection, the MMTel Enabler Server shall return 3xx status code, which shall contain a Location header with an URI pointing to the endpoint to another MMTel Enabler Server (service) instance.

### 5.5.2.5 MMTel_CallControl_Notify

#### 5.5.2.5.1 General

This service operation is used by the MMTel Enabler Server to notify the Application Servers of session events related to call control result.

#### 5.5.2.3.2 Notification for Call Control Result

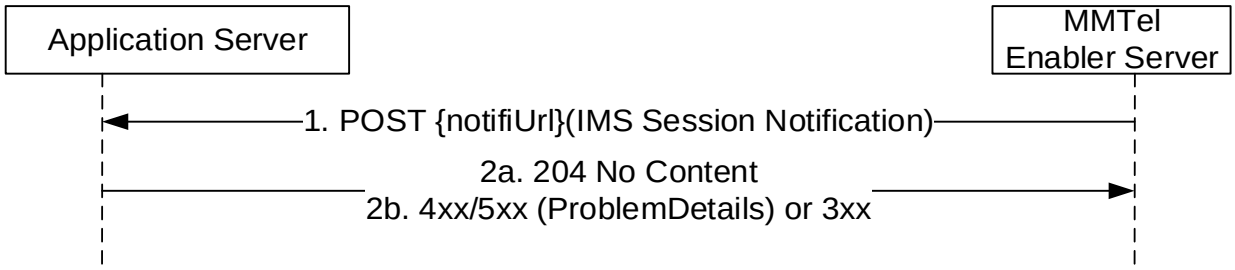


**Figure 5.5.2.5.2-1: Notification for Call Control Result**

1. If the MMTel Enabler Server receives the call control response, i.e. the Nnef_ImsSessionManagement_notify response, it determines based on the call control result subscriptions that the final call control result need to be notified to the Application Server, the MMTel Enabler Server shall send a POST request to the notifUri with request body including "ImsSessionEventNotification" data structure as specified in clause 6.4.5.2.2.

2a. Upon success, the Application Server responds with "204 No Content".

2b. On failure or redirection:

- The appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.4.6.

- In the case of redirection, the Application Server shall return 3xx status code, which shall contain a Location header with an URI pointing to the endpoint of another Application Server endpoint. A RedirectResponse IE may be included in the content of POST response.

# 6 API Definitions

## 6.1 MMTel_DCAppManagement API

### 6.1.1 Introduction

The MMTel_DCAppManagement shall use the MMTel_DCAppManagement API.

The API URI of the MMTel_DCAppManagement shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URIs used in HTTP requests shall have the Resource URI structure defined in clause 5.2.4 of 3GPP TS 29.122 [2], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificSuffixes>**

with the following components:

- The {apiRoot} shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [2].
- The <apiName> shall be "mmtel-dcappmgmt".
- The <apiVersion> shall be "v1".
- The <apiSpecificSuffixes> shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [2].

### 6.1.2 Usage of HTTP and common API related aspects

The provisions of clause 5.2 of 3GPP TS 29.122 [2] shall apply for the MMTel_DCAppManagement API.

### 6.1.3 Resources

#### 6.1.3.1 Overview

This clause describes the structure for the Resource URIs and the resources and methods used for the service.

Figure 6.1.3.1-1 depicts the resource URIs structure for the MMTel_DCAppManagement API.

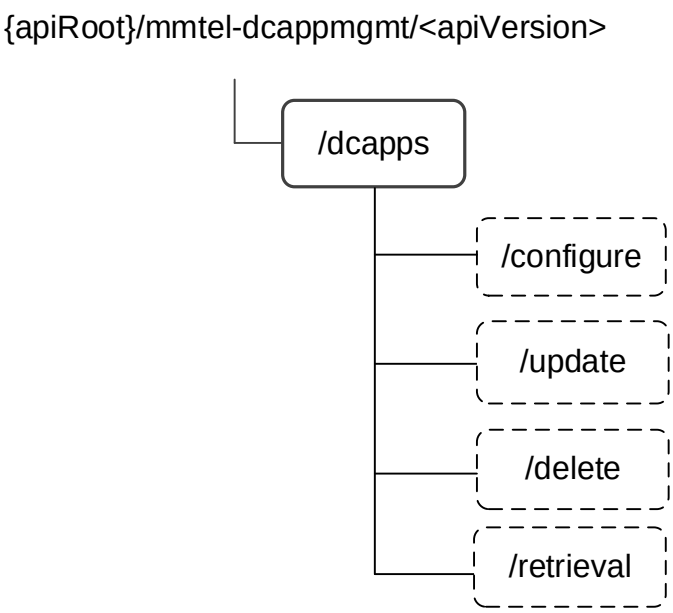


**Figure 6.1.3.1-1: Resource URI structure of the MMTel_DCAppManagement API**

Table 6.1.3.1-1 provides an overview of the resources and applicable HTTP methods.

**Table 6.1.3.1-1: Resources and methods overview**

| Resource name | Resource URI | HTTP method or custom operation | Description |
|---|---|---|---|
| DC APP | /dcapps/configure | POST | Configure DC application and DC application profile. |
| | /dcapps/update | POST | Update existing DC application and DC application profile. |
| | /dcapps/delete | POST | Delete existing DC application |
| | /dcapps/retrieval | POST | Obtain the DC APP profile related information according to the APPID |

### 6.1.3.2 Resource: DC APP

#### 6.1.3.2.1 Description

#### 6.1.3.2.2 Resource Definition

Resource URI: **{apiRoot}/mmtel-dcappmgmt/<apiVersion>/dcapps**

This resource shall support the resource URI variables defined in table 6.1.3.2.2-1.

**Table 6.1.3.2.2-1: Resource URI variables for this resource**

| Name | Data type | Definition |
|---|---|---|
| apiRoot | string | See clause 6.1.1 |

#### 6.1.3.2.3 Resource Standard Methods

None in current release of specification.

#### 6.1.3.2.4 Resource Custom Operations

##### 6.1.3.2.4.1 Overview

**Table 6.1.3.2.4.1-1: Custom operations**

| Operation name | Custom operaration URI | Mapped HTTP method | Description |
|---|---|---|---|
| Configure | /dcapps/configure | POST | Enables to configure DC application and DC application profile. |
| Update | /dcapps/update | POST | Enables to update existing DC application and DC application profile. |
| Delete | /dcapps/delete | POST | Enables to delete existing DC application and DC application profile. |
| Retieval | /dcapps/retrieval | POST | Enables to retrieval existing DC application and DC application profile. |

##### 6.1.3.2.4.2 Operation: Configure

This custom operation enables to configure DC application and DC application profile.

This operation shall support the request data structures specified in table 6.1.3.2.4.2-1 and the response data structure and response codes specified in table 6.1.3.2.4.2-2.

**Table 6.1.3.2.4.2-1: Data structures supported by the POST Request Body on this resource**

| Data type | P | Cardinality | Description |
|---|---|---|---|
| DcAppConfigReq | M | 1 | Represents the DC application and DC application profile configuration information. |

**Table 6.1.3.2.4.2-2: Data structures supported by the POST Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| DcAppConfigResp | M | 1 | 201 Created | Indicates the successfully configured list of APPID. |
| n/a | | | 307 Temporary Redirect | Temporary redirection.<br><br>The response shall include a Location header field containing an alternative URI of the resource located in an alternative MMTel Enabler Server.<br><br>Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a | | | 308 Permanent Redirect | Permanent redirection.<br><br>The response shall include a Location header field containing an alternative URI of the resource located in an alternative MMTel Enabler Server.<br><br>Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codse for the POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

**Table 6.1.3.2.4.2-3: Headers supported by the 307 Response Code on this resource**

| Name | Data type | P | Cardinality | Description |
|---|---|---|---|---|
| Location | string | M | 1 | An alternative URI of the resource located in an alternative MMTel Enabler Server. |

**Table 6.1.3.2.4.2-4: Headers supported by the 308 Response Code on this resource**

| Name | Data type | P | Cardinality | Description |
|---|---|---|---|---|
| Location | string | M | 1 | An alternative URI of the resource located in an alternative MMTel Enabler Server. |

### 6.1.3.2.4.3 Operation: Update

This custom operation enables to update existing DC application and DC application profile.

This operation shall support the request data structures specified in table 6.1.3.2.4.3-1 and the response data structure and response codes specified in table 6.1.3.2.4.3-2.

**Table 6.1.3.2.4.3-1: Data structures supported by the POST Request Body on this resource**

| Data type | P | Cardinality | Description |
|---|---|---|---|
| DcAppUpdateReq | M | 1 | Represents the DC application and DC application profile information that shall be updated. |

**Table 6.1.3.2.4.3-2: Data structures supported by the POST Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| DcAppStatResp | M | 1 | 200 OK | Indicates the successfully updated list of APPID. |
| n/a | | | 307 Temporary Redirect | Temporary redirection.<br><br>The response shall include a Location header field containing an alternative URI of the resource located in an alternative MMTel Enabler Server.<br><br>Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a | | | 308 Permanent Redirect | Permanent redirection.<br><br>The response shall include a Location header field containing an alternative URI of the resource located in an alternative MMTel Enabler Server.<br><br>Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [3] shall also apply. | | | | |

**Table 6.1.3.2.4.3-3: Headers supported by the 307 Response Code on this resource**

| Name | Data type | P | Cardinality | Description |
|---|---|---|---|---|
| Location | string | M | 1 | An alternative URI of the resource located in an alternative MMTel Enabler Server. |

**Table 6.1.3.2.4.3-4: Headers supported by the 308 Response Code on this resource**

| Name | Data type | P | Cardinality | Description |
|---|---|---|---|---|
| Location | string | M | 1 | An alternative URI of the resource located in an alternative MMTel Enabler Server. |

### 6.1.3.2.4.4 Operation: Delete

This custom operation enables to delete existing DC application.

This operation shall support the request data structures specified in table 6.1.3.2.4.4-1 and the response data structure and response codes specified in table 6.1.3.2.4.4-2.

**Table 6.1.3.2.4.4-1: Data structures supported by the POST Request Body on this resource**

| Data type | P | Cardinality | Description |
|---|---|---|---|
| DcAppIdReq | M | 1 | Represents the DC application and DC application that shall be deleted. |

**Table 6.1.3.2.4.4-2: Data structures supported by the POST Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| DcAppIdResp | M | 1 | 200 OK | Indicates the successfully deleted list of APPID. |
| n/a | | | 307 Temporary Redirect | Temporary redirection.<br><br>The response shall include a Location header field containing an alternative URI of the resource located in an alternative MMTel Enabler Server.<br><br>Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a | | | 308 Permanent Redirect | Permanent redirection.<br><br>The response shall include a Location header field containing an alternative URI of the resource located in an alternative MMTel Enabler Server.<br><br>Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

**Table 6.1.3.2.4.4-3: Headers supported by the 307 Response Code on this resource**

| Name | Data type | P | Cardinality | Description |
|---|---|---|---|---|
| Location | string | M | 1 | An alternative URI of the resource located in an alternative MMTel Enabler Server. |

**Table 6.1.3.2.4.4-4: Headers supported by the 308 Response Code on this resource**

| Name | Data type | P | Cardinality | Description |
|---|---|---|---|---|
| Location | string | M | 1 | An alternative URI of the resource located in an alternative MMTel Enabler Server. |

### 6.1.3.2.4.5 Operation: Retrieval

This custom operation enables to retrieval existing DC application.

This operation shall support the request data structures specified in table 6.1.3.2.4.5-1 and the response data structure and response codes specified in table 6.1.3.2.4.5-2.

**Table 6.1.3.2.4.5-1: Data structures supported by the POST Request Body on this resource**

| Data type | P | Cardinality | Description |
|---|---|---|---|
| DcAppIdReq | M | 1 | Represents the requested DC application information. |

**Table 6.1.3.2.4.5-2: Data structures supported by the POST Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| DcAppIdResp | M | 1 | 200 OK | The requested DC application profile related information is returned |
| n/a | | | 307 Temporary Redirect | Temporary redirection.<br><br>The response shall include a Location header field containing an alternative URI of the resource located in an alternative MMTel Enabler Server.<br><br>Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a | | | 308 Permanent Redirect | Permanent redirection.<br><br>The response shall include a Location header field containing an alternative URI of the resource located in an alternative MMTel Enabler Server.<br><br>Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

**Table 6.1.3.2.4.5-3: Headers supported by the 307 Response Code on this resource**

| Name | Data type | P | Cardinality | Description |
|---|---|---|---|---|
| Location | string | M | 1 | An alternative URI of the resource located in an alternative MMTel Enabler Server. |

**Table 6.1.3.2.4.5-4: Headers supported by the 308 Response Code on this resource**

| Name | Data type | P | Cardinality | Description |
|---|---|---|---|---|
| Location | string | M | 1 | An alternative URI of the resource located in an alternative MMTel Enabler Server. |

## 6.1.4 Custom Operations without associated resources

There are no custom operations without associated resources defined for this API in this release of the specification.

## 6.1.5 Notifications

There are no custom operations without associated resources defined for this API in this release of the specification.

## 6.1.6 Data Model

### 6.1.6.1 General

This clause specifies the application data model supported by the API.

Table 6.1.6.1-1 specifies the data types defined specifically for the MMTel_DCAppManagement API service.

**Table 6.1.6.1-1: MMTel_DCAppManagement API specific Data Types**

| Data type | Section defined | Description | Applicability |
|---|---|---|---|
| AppLoadPhase | 6.1.6.3.3 | Represents the load phase of the DC application | |
| Condition | 6.1.6.3.6 | Represents the conditions used by the DC application | |
| DcAppConfigParameters | 6.1.6.2.3 | Represents the parameters of single-DC applicaion in the configuration request | |
| DcAppConfigReq | 6.1.6.2.2 | Represents the DC application and profile configuration request | |
| DcAppConfigResp | 6.1.6.2.4 | Represents the DC application and profile configuration response | |
| DcAppConfigResponseParameters | 6.2.6.2.5 | Represents the parameters of single-DC applicaion in the configuration response | |
| DcAppIdReq | 6.1.6.2.10 | Represents the DC application delete request and DC application information retrieval request | |
| DcAppIdResp | 6.1.6.2.11 | Represents the DC application profile information retrieval response | |
| DcAppResponseParameters | 6.1.6.2.9 | Represents the parameters of single-DC applicaion in the DC application and profile update response and DC application delete response | |
| DcAppStatResp | 6.1.6.2.8 | Represents the DC application and profile update response or DC application delete response | |
| DcAppUpdateReq | 6.1.6.2.6 | Represents the DC application and profile update request | |
| DcAppUpdateParameters | 6.1.6.2.7 | Represents the parameters of single-DC applicaion in the update response | |
| Status | 6.1.6.3.5 | Represents the request return status | |
| SupportScenario | 6.1.6.3.4 | Represents the support scenario of the DC application | |

Table 6.1.6.1-2 specifies data types re-used by theMMTel_DCAppManagement API service.

**Table 6.1.6.1-2: Re-used Data Types**

| Data type | Reference | Comments | Applicability |
|---|---|---|---|
| Binary | 3GPP TS 29.122 [3] | Used to represent binary values. | |
| DateTime | 3GPP TS 29.122 [3] | Used to represent the subscription duration. | |
| Uri | 3GPP TS 29.122 [3] | Used to indicate the notification URI. | |

## 6.1.6.2 Structured data types

### 6.1.6.2.1 Introduction

This clause defines the structures to be used in resource representations.

#### 6.1.6.2.2 Type: DcAppConfigReq

**Table 6.1.6.2.2-1: Definition of type DcAppConfigReq**

| Attribute name | Data type | P | Cardinality | Description | Applicability |
|---|---|---|---|---|---|
| reqId | string | M | 1 | The identity of the DC Application provider | |
| secCred | string | O | 0..1 | Security information required by the MMTel Enabler Server. | |
| dcAppNum | integer | M | 1 | Indicates the total number of DC Application. | |
| dcAppConfigParamList | array(DcAppConfigParameters) | M | 1..N | The list of DC application configuration parameters. | |

#### 6.1.6.2.3 Type: DcAppConfigParameters

**Table 6.1.6.2.3-1: Definition of type DcAppConfigParameters**

| Attribute name | Data type | P | Cardinality | Description | Applicability |
|---|---|---|---|---|---|
| appIndex | string | M | 1 | The index of the DC Application configuration parameter. | |
| appName | string | O | 0..1 | The name of the Data Channel Application. | |
| svcType | string | O | 0..1 | The service type of the Data Channel Application. | |
| appIconUrl | Uri | O | 0..1 | The url of the Data Channel Application icon. | |
| appVer | string | O | 0..1 | The latest version of the DC application in UE. | |
| appVal | DateTime | O | 0..1 | The latest validity of the DC application. | |
| appLoadPh | AppLoadPhase | O | 0..1 | Indicates the phase when this Data Channel Application is allowed to be used. | |
| autoload | boolean | O | 0..1 | Indicates whether this Data Channel Application is needed to be load to the UE automatically.<br>Set to "true" if this Data Channel Application is needed to be load to the UE automatically. otherwise set to "false". Default value is "false". | |
| autolaunch | boolean | O | 0..1 | Indicates whether this Data Channel Application is needed to be downloaded to the UE and run automatically.<br>Set to "true" if this Data Channel Application is needed to be downloaded to the UE and run automatically. otherwise set to "false". Default value is "false". | |
| peerDcReq | boolean | O | 0..1 | Indicates whether this Data Channel Application can be used if Data Channel is not supported by the other party of the call.<br>Set to "true" if this Data Channel Application can be used if Data Channel is not supported by the other party of the call. otherwise set to "false". Default value is "false". | |
| suppScnr | SupportScenario | O | 0..1 | Indicates supported media type required for this Data Channel Application. | |
| cond | array(Condition) | O | 0..N | Indicates whether this Data Channel Application can be used if under the conditions | |
| qosReq | string | O | 0..1 | Indicates the QoS requirement of this Data Channel Application. | |
| persDataColl | boolean | O | 0..1 | Indicates whether this Data Channel Application will collect the user personal data.<br>Set to "true" if this Data Channel Application will collect the user personal data. otherwise set to "false". Default value is "false". | |
| persDataCollInfoUrl | Uri | O | 0..1 | The url of the purpose description of mandatory and optional personal data to be collected. | |
| appPkg | Binary | O | 0..1 | The package of the Data Channel Application. | |

#### 6.1.6.2.4 Type: DcAppConfigResp

**Table 6.1.6.2.4-1: Definition of type DcAppConfigResp**

| Attribute name | Data type | P | Cardinality | Description | Applicability |
|---|---|---|---|---|---|
| dcAppConfigRespList | array(DcAppConfigResponseParameters) | M | 1..N | The list of DC application configuration response parameters. | |

#### 6.1.6.2.5 Type: DcAppConfigResponseParameters

**Table 6.1.6.2.5-1: Definition of type DcAppConfigResponseParameters**

| Attribute name | Data type | P | Cardinality | Description | Applicability |
|---|---|---|---|---|---|
| appIndex | string | M | 1 | The index of the DC Application configuration parameter. | |
| status | Status | M | 1 | Indicates the success or failure of the request. | |
| appId | string | C | 0..1 | The unique identifier of the Data Channel Application assigned by the MMTel Enabler Server.<br>May only be present if the status sets to "SUCCESS". | |
| failureCause | string | C | 0..1 | The failure reason the DC Application configuration.<br>May only be present if the status sets to "FAILED". | |

#### 6.1.6.2.6 Type: DcAppUpdateReq

**Table 6.1.6.2.6-1: Definition of type DcAppUpdateReq**

| Attribute name | Data type | P | Cardinality | Description | Applicability |
|---|---|---|---|---|---|
| reqId | string | M | 1 | The identity of the DC Application provider | |
| secCred | string | O | 0..1 | Security information required by the MMTel Enabler Server. | |
| dcAppNum | integer | M | 1 | Indicates the total number of DC Application. | |
| dcAppUpdateParamList | array(DcAppUpdateParameters) | M | 1..N | The list of DC application update parameters. | |

#### 6.1.6.2.7 Type: DcAppUpdateParameters

**Table 6.1.6.2.7-1: Definition of type DcAppUpdateParameters**

| Attribute name | Data type | P | Cardinality | Description | Applicability |
|---|---|---|---|---|---|
| appId | string | M | 1 | The unique identifier of the Data Channel Application assigned by the MMTel Enabler Server. | |
| appName | string | O | 0..1 | The name of the Data Channel Application. | |
| svcType | string | O | 0..1 | The service type of the Data Channel Application. | |
| appIconUrl | Uri | O | 0..1 | The url of the Data Channel Application icon. | |
| appVer | string | O | 0..1 | The latest version of the DC application in UE. | |
| appVal | DateTime | O | 0..1 | The latest validity of the DC application. | |
| appLoadPh | AppLoadPhase | O | 0..1 | Indicates the phase when this Data Channel Application is allowed to be used. | |
| autoload | boolean | O | 0..1 | Indicates whether this Data Channel Application is needed to be load to the UE automatically.<br>Set to "true" if this Data Channel Application is needed to be load to the UE automatically. otherwise set to "false". Default value is "false". | |
| autolaunch | boolean | O | 0..1 | Indicates whether this Data Channel Application is needed to be downloaded to the UE and run automatically.<br>Set to "true" if this Data Channel Application is needed to be downloaded to the UE and run automatically. otherwise set to "false". Default value is "false". | |
| peerDcReq | boolean | O | 0..1 | Indicates whether this Data Channel Application can be used if Data Channel is not supported by the other party of the call.<br>Set to "true" if this Data Channel Application can be used if Data Channel is not supported by the other party of the call. otherwise set to "false". Default value is "false". | |
| suppScnr | SupportScenario | O | 0..1 | Indicates supported media type required for this Data Channel Application. | |
| cond | Condition | O | 0..1 | Indicates whether this Data Channel Application can be used if under this condition | |
| qosReq | string | O | 0..1 | Indicates the QoS requirement of this Data Channel Application. | |
| persDataColl | boolean | O | 0..1 | Indicates whether this Data Channel Application will collect the user personal data.<br>Set to "true" if this Data Channel Application will collect the user personal data. otherwise set to "false". Default value is "false". | |
| persDataCollInfoUrl | Uri | O | 0..1 | The url of the purpose description of mandatory and optional personal data to be collected. | |
| appPkg | Binary | O | 0..1 | The package of the Data Channel Application. | |

#### 6.1.6.2.8 Type: DcAppStatResp

**Table 6.1.6.2.8-1: Definition of type DcAppStatResp**

| Attribute name | Data type | P | Cardinality | Description | Applicability |
|---|---|---|---|---|---|
| dcAppStatRespList | array(DcAppResponseParameters) | M | 1..N | The list of DC application update response parameters. | |

#### 6.1.6.2.9 Type: DcAppResponseParameters

**Table 6.1.6.2.9-1: Definition of type DcAppResponseParameters**

| Attribute name | Data type | P | Cardinality | Description | Applicability |
|---|---|---|---|---|---|
| appId | string | M | 1 | The unique identifier of the Data Channel Application assigned by the MMTel Enabler Server. | |
| status | Status | M | 1 | Indicates the success or failure of the request. | |
| failureCause | string | C | 0..1 | The failure reason the DC Application configuration.<br>May only be present if the status sets to "FAILED". | |

#### 6.1.6.2.10 Type: DcAppIdReq

**Table 6.1.6.2.10-1: Definition of type DcAppIdReq**

| Attribute name | Data type | P | Cardinality | Description | Applicability |
|---|---|---|---|---|---|
| reqId | string | M | 1 | The identity of the DC Application provider | |
| secCred | string | O | 0..1 | Security information required by the MMTel Enabler Server. | |
| dcAppNum | integer | M | 1 | Indicates the total number of DC Application. | |
| appIdList | array(string) | M | 1..N | The list of appId. | |

#### 6.1.6.2.11 Type: DcAppIdResp

**Table 6.1.6.2.11-1: Definition of type DcAppIdResp**

| Attribute name | Data type | P | Cardinality | Description | Applicability |
|---|---|---|---|---|---|
| status | Status | M | 1 | Indicates the success or failure of the request. | |
| secCred | string | O | 0..1 | Security information required by the MMTel Enabler Server. | |
| dcAppInfoList | array(DcAppUpdateParameters) | C | 1..N | The list of DC application profile information.<br>May only be present if the status sets to "SUCCESS". | |
| failureCause | string | C | 0..1 | The failure reason the DC Application configuration.<br>May only be present if the status sets to "FAILED". | |
| NOTE: The "appPkg" attribute within the DcAppUpdateParameters data type provided within this attriute is not applicable and shall not be present. | | | | | |

### 6.1.6.3 Simple data types and enumerations

#### 6.1.6.3.1 Introduction

This clause defines simple data types and enumerations that can be referenced from data structures defined in the previous clauses.

#### 6.1.6.3.2 Simple data types

None.

#### 6.1.6.3.3 Enumeration: AppLoadPhase

**Table 6.1.6.3.3-1: Enumeration AppLoadPhase**

| Enumeration value | Description | Applicability |
|---|---|---|
| PRECALL_ONLY | The Data Channel Application is allowed to be used before the MMTel call session is established. | |
| INCALL | The Data Channel Application is allowed to be used after the MMTel call session is established. | |
| PRECALL_AND_INCALL | The Data Channel Application is allowed to be used during the entire Precall and incall. | |

#### 6.1.6.3.4 Enumeration: SupportScenario

**Table 6.1.6.3.4-1: Enumeration SupportScenario**

| Enumeration value | Description | Applicability |
|---|---|---|
| VOICE_CALL_ONLY | The Data Channel Application can be used if and only if the corresponding call is a voice call. | |
| VIDEO_CALL_ONLY | The Data Channel Application can be used if and only if the corresponding call is a video call. | |
| VOICE_AND_VIDEO_CALL | The Data Channel Application can be used in both voice call and video call. | |

#### 6.1.6.3.5 Enumeration: Status

**Table 6.1.6.3.5-1: Enumeration Status**

| Enumeration value | Description | Applicability |
|---|---|---|
| SUCCESS | Indicates that the request is processed successfully. | |
| FAILED | Indicates that the request fails to be processed. | |

#### 6.1.6.3.6 Enumeration: Condition

**Table 6.1.6.3.6-1: Definition of type Condition**

| Enumeration value | Description | Applicability |
|---|---|---|
| CONDTY | The Data Channel Application is allowed to be used in this condition, e.g. Service area | |
| CONDVA | The value of the CONFTY. | |

## 6.1.7 Error Handling

### 6.1.7.1 General

For the MMTel_DCAppManagement API, HTTP error responses shall be supported as specified in clause 5.2.6 of 3GPP TS 29.122 [2]. Protocol errors and application errors specified in clause 5.2.6 of 3GPP TS 29.122 [2] shall be supported for the HTTP status codes specified in table 5.2.6-1 of 3GPP TS 29.122 [2].

In addition, the requirements in the following clauses are applicable for the MMTel_DCAppManagement API.

### 6.1.7.2 Protocol Errors

No specific protocol errors for the MMTel_DCAppManagement API are specified.

### 6.1.7.3 Application Errors

The application errors defined for the MMTel_DCAppManagement API are listed in Table 6.1.7.3-1.

**Table 6.1.7.3-1: Application errors**

| Application Error | HTTP status code | Description |
|---|---|---|
| | | |

## 6.1.8 Feature negotiation

The optional features in table 6.1.8-1 are defined for the MMTel_DCAppManagement API. They shall be negotiated using the extensibility mechanism defined in clause 5.2.7 of 3GPP TS 29.122 [2].

**Table 6.1.8-1: Supported Features**

| Feature number | Feature Name | Description |
|---|---|---|
| | | |

## 6.1.9 Security

The provisions of clause 6 of 3GPP TS 29.122 [2] shall apply for the MMTel_DCAppManagement API.

# 6.2 MMTel_DCAppCall API

## 6.2.1 Introduction

The MMTel_DCAppCall shall use the MMTel_DCAppCall API.

The API URI of the MMTel_DCAppCall shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URIs used in HTTP requests shall have the Resource URI structure defined in clause 5.2.4 of 3GPP TS 29.122 [2], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificSuffixes>**

with the following components:

- The {apiRoot} shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [2].
- The <apiName> shall be "mmtel-dcappcall".
- The <apiVersion> shall be "v1".
- The <apiSpecificSuffixes> shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [2].

## 6.2.2 Usage of HTTP and common API related aspects

The provisions of clause 5.2 of 3GPP TS 29.122 [2] shall apply for the MMTel_DCAppCall API.

## 6.2.3 Resources

There are no resources defined for this API in this release of the specification.

## 6.2.4 Custom Operations without associated resources

### 6.2.4.1 Overview

Figure 6.2.4.1-1 depicts the resource URIs structure for the MMTel_DCAppCall API.

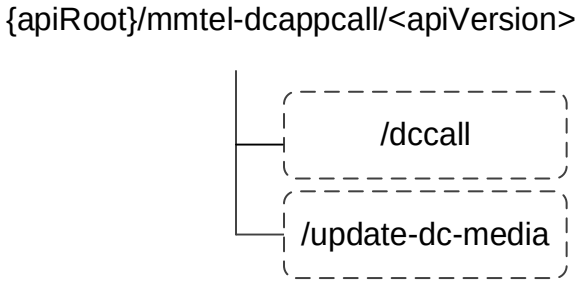


**Figure 6.2.4.1-1: Custom operation URI structure of the MMTel_DCAppCall API**

Table 6.2.4.1-1 provides an overview of the custom operations and applicable HTTP methods defined for the MMTel_DCAppCall API.

**Table 6.2.4.1-1: Custom operations without associated resources**

| Custom operation URI | Mapped HTTP method | Description |
|---|---|---|
| {apiRoot}/mmtel-dcappcall/<apiVersion>/dccall | POST | Request of AS to establish a DC capability enabled call to a given MMTel Enabler Server. |
| {apiRoot}/mmtel-dcappcall/<apiVersion>/update-dc-media | POST | Request of AS to update DC media of an application call to a given MMTel Enabler Server. |

### 6.2.4.2 Operation: update-dc-media

#### 6.2.4.2.1 Description

This operation is used by the Application Server to request a call enabled by DC capabilities to a given MMTel Enabler Server.

#### 6.2.4.2.2 Operation Definition

This operation shall support the response data structures and response codes specified in Table 6.2.4.2.2-1 and Table 6.2.4.2.2-2.

**Table 6.2.4.2.2-1: Data structures supported by the POST Request Body on this resource**

| Data type | P | Cardinality | Description |
|---|---|---|---|
| DCMediaUpdateReq | M | 1 | Represents the requested DC media update information. |

**Table 6.2.4.2.2-2: Data structures supported by the POST Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| DCMediaUpdateResp | M | 1 | 200 OK | The requested update information of DC media is returned. |
| n/a | | | 307 Temporary Redirect | Temporary redirection.<br><br>The response shall include a Location header field containing an alternative URI of the resource located in an alternative MMTel Enabler Server.<br><br>Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a | | | 308 Permanent Redirect | Permanent redirection.<br><br>The response shall include a Location header field containing an alternative URI of the resource located in an alternative MMTel Enabler Server.<br><br>Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

**Table 6.2.4.2.2-: Headers supported by the 307 method on this resource**

| Name | Data type | P | Cardinality | Description |
|---|---|---|---|---|
| Location | string | M | 1 | An alternative URI of the resource located in an alternative MMTel Enabler Server. |

**Table 6.2.4.2.2-5: Headers supported by the 308 response code on this resource**

| Name | Data type | P | Cardinality | Description |
|---|---|---|---|---|
| Location | string | M | 1 | An alternative URI of the resource located in an alternative MMTel Enabler Server. |

### 6.2.4.3 Operation: dccall

#### 6.2.4.3.1 Description

This operation is used by the Application Server to request a call enabled by DC capabilities to a given MMTel Enabler Server.

#### 6.2.4.3.2 Operation Definition

This operation shall support the response data structures and response codes specified in Table 6.2.4.3.2-1 and Table 6.2.4.3.2-2.

**Table 6.2.4.3.2-1: Data structures supported by the POST Request Body on this resource**

| Data type | P | Cardinality | Description |
|---|---|---|---|
| DcCallReq | M | 1 | Represents the requested DC Call. |

**Table 6.2.4.3.2-2: Data structures supported by the POST Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| DcCallResp | M | 1 | 200 OK | The requested DC Call information is returned. |
| n/a | | | 307 Temporary Redirect | Temporary redirection.<br><br>The response shall include a Location header field containing an alternative URI of the resource located in an alternative MMTel Enabler Server.<br><br>Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a | | | 308 Permanent Redirect | Permanent redirection.<br><br>The response shall include a Location header field containing an alternative URI of the resource located in an alternative MMTel Enabler Server.<br><br>Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

**Table 6.2.4.3.2-3: Headers supported by the 307 method on this resource**

| Name | Data type | P | Cardinality | Description |
|---|---|---|---|---|
| Location | string | M | 1 | An alternative URI of the resource located in an alternative MMTel Enabler Server. |

**Table 6.2.4.3.2-5: Headers supported by the 308 response code on this resource**

| Name | Data type | P | Cardinality | Description |
|---|---|---|---|---|
| Location | string | M | 1 | An alternative URI of the resource located in an alternative MMTel Enabler Server. |

## 6.2.5 Notifications

The MMTel_DCAppCall API supports notifications from the MMTel Enabler Server to the Application Server for asynchronous event reporting. Notifications shall comply to clause 5.2.5 of 3GPP TS 29.122 [2].

**Table 6.2.5.1-1: Notifications overview**

| Notification | Callback URI | HTTP method or custom operation | Description (service operation) |
|---|---|---|---|
| DC Media Notification | {notificationURI} | POST | Notify about DC Media changes from MMTel Enabler Server. |

### 6.2.5.1 DC Media Notification

#### 6.2.5.1.1 Description

The DC Media Notification is used by the MMTel Enabler Server to notify DC Media change to the Application Server.

#### 6.2.5.1.2 Target URI

The Callback URI **"{notificationURI}"** shall be used with the callback URI variables defined in table 6.2.5.1.2-1.

**Table 6.2.5.1.2-1: Callback URI variables**

| Name | Definition |
|---|---|
| notificationInfo | String formatted as URI with the Callback Uri |

#### 6.2.5.1.3 Standard Methods

##### 6.2.5.1.3.1 POST

This method shall support the request data structures specified in table 6.2.5.1.3.1-1 and the response data structures and response codes specified in table 6.2.5.1.3.1-2.

**Table 6.2.5.1.3.1-1: Data structures supported by the POST Request Body**

| Data type | P | Cardinality | Description |
|---|---|---|---|
| DcMediaNotifyReq | M | 1 | Provides information about subscribed DC Media. |

**Table 6.2.5.1.3.1-2: Data structures supported by the POST Response Body**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| DcMediaNotifyResp | M | 1 | 200 OK | The receipt of the Notification is acknowledged. |
| n/a | | | 307 Temporary Redirect | Temporary redirection.<br><br>The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer towards which the notification should be sent.<br><br>Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a | | | 308 Permanent Redirect | Permanent redirection.<br><br>The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer towards which the notification should be sent.<br><br>Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [24] shall also apply. | | | | |

**Table 6.2.5.1.3.1-3: Headers supported by the 307 Response Code on this resource**

| Name | Data type | P | Cardinality | Description |
|---|---|---|---|---|
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

**Table 6.2.5.1.3.1-4: Headers supported by the 308 Response Code on this resource**

| Name | Data type | P | Cardinality | Description |
|---|---|---|---|---|
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

## 6.2.6 Data Model

### 6.2.6.1 General

This clause specifies the application data model supported by the API.

Table 6.2.6.1-1 specifies the data types defined specifically for the MMTel_DCAppCall API service.

**Table 6.2.6.1-1: MMTel_DCAppCall API specific Data Types**

| Data type | Section defined | Description | Applicability |
|---|---|---|---|
| AdcType | 6.2.6.3.3 | Represents the type of DC communication | |
| CallType | 6.2.6.3.4 | Represents the call is established as A2P or P2P call | |
| DcCallReq | 6.2.6.2.2 | Represents the DC Call establishment request | |
| DcCallResp | 6.2.6.2.3 | Represents the DC Call establishment response | |
| DcMediaUpdateReq | 6.2.6.2.4 | Represents the DC media update request | |
| DcMediaUpdateResp | 6.2.6.2.5 | Represents the DC media update response | |
| DcMediaNotifyReq | 6.2.6.2.6 | Represents the DC media update notification request | |
| DcMediaNotifyResp | 6.2.6.2.6 | Represents the DC media update notification response | |

Table 6.2.6.1-2 specifies data types re-used by the MMTel_DCAppCall API service.

**Table 6.2.6.1-2: Re-used Data Types**

| Data type | Reference | Comments | Applicability |
|---|---|---|---|
| DcAppUpdateParameters | 6.1.6.2.7 | Parameters of DC application profile | |
| Uri | 3GPP TS 29.571 [7] | Represents a URI. | |

## 6.2.6.2 Structured data types

### 6.2.6.2.1 Introduction

This clause defines the structures to be used in resource representations.

#### 6.2.6.2.2 Type: DCCallReq

**Table 6.2.6.2.2: Definition of type DcCallReq**

| Attribute name | Data type | P | Cardinality | Description | Applicability |
|---|---|---|---|---|---|
| originatingId | Uri | C | 0..1 | The identifier of the caller, corresponding to participant address in OMA Third Party Call API [15], which could be 'sip' URI, 'tel' URI or 'acr' URI. (NOTE) | |
| terminatingId | Uri | M | 1 | The identifier of the callee, corresponding to participant address in OMA Third Party Call API [15], which could be 'sip' URI, 'tel' URI or 'acr' URI. | |
| mediaInfo | array(string) | O | 1..N | Identifier of one or more media type(s), corresponding to the mediaInfo of Call | |
| dcMediaInfo | boolean | O | 0..1 | Identifier of whether DC media is expected to be used. | |
| appProfileRequested | DcAppUpdateParameters | O | 0..1 | The DC application profile expected to be used. | |
| notificationInfo | Uri | M | 1 | The address where call related notification is sent, corresponding to callbackReference in OMA Third Party Call API. | |
| callType | CallType | M | 1 | Indicate if the call is established as A2P or P2P call. | |
| NOTE: The "originatingId" attribute shall be present if the "callType" is P2P | | | | | |

#### 6.2.6.2.3 Type: DcCallResp

**Table 6.2.6.2.3-1: Definition of type DcCallResp**

| Attribute name | Data type | P | Cardinality | Description | Applicability |
|---|---|---|---|---|---|
| callResult | string | M | 1 | Indication if the Call establishment is success or failure. | |
| sessionId | string | O | 0..1 | The identifier of the call session, corresponding to callSessionId in OMA Third Party Call API | |
| failureCause | string | O | 0..1 | The reason for failure, corresponding to callSessionId in OMA Third Party Call API | |
| originatingId | string | C | 0..1 | The identifier of the caller, corresponding to participant address in OMA Third Party Call API [15], which could be 'sip' URI, 'tel' URI or 'acr' URI. (NOTE) | |
| terminatingId | string | M | 1 | The identifier of the callee, corresponding to participant address in OMA Third Party Call API [15], which could be 'sip' URI, 'tel' URI or 'acr' URI. | |
| mediaInfo | array(string) | O | 1..N | Identifier of one or more media type(s) | |
| dcMediaInfo | string | O | 0..1 | Identifier of whether DC media is expected to be used | |
| appProfileRequested | DcAppUpdateParameters | O | 0..1 | The DC application profile expected to be used | |
| callType | CallType | M | 1 | Indicate if the call is established as A2P or P2P call. | |
| NOTE: The "originatingId" attribute shall be present if the "callType" is P2P | | | | | |

#### 6.2.6.2.4 Type: DcMediaUpdateReq

**Table 6.2.6.2.4-1: Definition of type DcMediaUpdateReq**

| Attribute name | Data type | P | Cardinality | Description | Applicability |
|---|---|---|---|---|---|
| dcAppId | string | M | 1 | The identifier of the DC application | |
| sessionId | string | M | 1 | The session identifier for media update | |
| mediaResourceInfo | object | O | 0..1 | The media information to be passed via the Data Channel | |
| appProfileRequested | DcAppUpdateParameters | O | 0..1 | The DC application profile expected to be used | |
| notificationInfo | Uri | M | 1 | The address where call related notification is sent to | |
| mediaDirection | AdcType | M | 1 | Type of DC communication, e.g. A2P or P2A. | |

#### 6.2.6.2.5 Type: DcMediaUpdateResp

**Table 6.2.6.2.5-1: Definition of type DcMediaUpdateResp**

| Attribute name | Data type | P | Cardinality | Description | Applicability |
|---|---|---|---|---|---|
| sessionId | string | M | 1 | The session identifier of the session | |
| result | Status | M | 1 | Indicates if the request was successful or failed | |
| cause | string | O | 0..1 | Indicates the cause of request failure | |

#### 6.2.6.2.6 Type: DcMediaNotifyReq

**Table 6.2.6.2.6-1: Definition of type DcMediaNotifyReq**

| Attribute name | Data type | P | Cardinality | Description | Applicability |
|---|---|---|---|---|---|
| sessionId | string | M | 1 | The session identifier of the session | |
| mediaResourceInfo | object | M | 1 | The media information to be passed via the Data Channel | |
| mediaDirection | AdcType | M | 1 | Type of DC communication, e.g. A2P or P2A. | |

#### 6.2.6.2.7 Type: DcMediaNotifyResp

**Table 6.2.6.2.7-1: Definition of type DcMediaNotifyResp**

| Attribute name | Data type | P | Cardinality | Description | Applicability |
|---|---|---|---|---|---|
| sessionId | string | M | 1 | The session identifier of the session | |
| result | Status | M | 1 | Indicates if the request was successful or failed | |
| cause | string | O | 0..1 | Indicates the cause of request failure | |

### 6.2.6.3 Simple data types and enumerations

#### 6.2.6.3.1 Introduction

This clause defines simple data types and enumerations that can be referenced from data structures defined in the previous clauses.

#### 6.2.6.3.2 Simple data types

None.

#### 6.2.6.3.3 Enumeration: AdcType

**Table 6.2.6.3.3-1: Enumeration AdcType**

| Enumeration value | Description |
|---|---|
| "A2P" | Presenting Data Channel initiated by Application. |
| "P2A " | Presenting Data Channel initiated by UE. |

#### 6.2.6.3.4 Enumeration: CallType

**Table 6.2.6.3.4-1: Enumeration CallType**

| Enumeration value | Description |
|---|---|
| "A2P" | Presenting the call as Application call initiated by Application to UE. |
| "P2P " | Presenting the call as Third Party call established between two UEs. |

## 6.2.7 Error Handling

### 6.2.7.1 General

For the MMTel_DCAppCall API, HTTP error responses shall be supported as specified in clause 5.2.6 of 3GPP TS 29.122 [2]. Protocol errors and application errors specified in clause 5.2.6 of 3GPP TS 29.122 [2] shall be supported for the HTTP status codes specified in table 5.2.6-1 of 3GPP TS 29.122 [2].

In addition, the requirements in the following clauses are applicable for the MMTel_DCAppCall API.

### 6.2.7.2 Protocol Errors

No specific protocol errors for the MMTel_DCAppCall API are specified.

### 6.2.7.3 Application Errors

The application errors defined for the MMTel_DCAppCall API are listed in Table 6.2.7.3-1.

**Table 6.2.7.3-1: Application errors**

| Application Error | HTTP status code | Description |
|---|---|---|
| | | |

## 6.2.8 Feature negotiation

The optional features in table 6.2.8-1 are defined for the MMTel_DCAppCall API. They shall be negotiated using the extensibility mechanism defined in clause 5.2.7 of 3GPP TS 29.122 [2].

**Table 6.2.8-1: Supported Features**

| Feature number | Feature Name | Description |
|---|---|---|
| | | |

## 6.2.9 Security

The provisions of clause 6 of 3GPP TS 29.122 [2] shall apply for the MMTel_DCAppCall API.

# 6.3 MMTel_CallEvent Service API

## 6.3.1 Introduction

The MMTel_CallEvent service shall use the MMTel_CallEvent API.

The API URI of the MMTel_CallEvent API shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URIs used in HTTP requests from the NF service consumer towards the NF service producer shall have the Resource URI structure defined in clause 4.4.1 of 3GPP TS 29.501 [3], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificResourceUriPart>**

with the following components:

- The {apiRoot} shall be set as described in 3GPP TS 29.501 [3].
- The <apiName> shall be "mmtel-callevent".
- The <apiVersion> shall be "v1".
- The <apiSpecificResourceUriPart> shall be set as described in clause 6.3.3.

## 6.3.2 Usage of HTTP and common API related aspects

The provisions of clause 5.2 of 3GPP TS 29.222 [9] shall apply for the MMTel_CallEvent API.

## 6.3.3 Resources

### 6.3.3.1 Overview

This clause describes the structure for the Resource URIs and the resources and methods used for the service.

Figure 6.3.3.1-1 depicts the resource URIs structure for the MMTel_CallEvent service API.

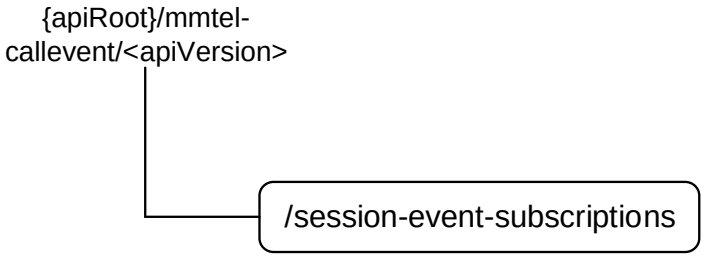


**Figure 6.3.3.1-1: Resource URI structure of the MMTel_CallEvent API**

Table 6.3.3.1-1 provides an overview of the resources and applicable HTTP methods.

**Table 6.3.3.1-1: Resources and methods overview**

| Resource purpose/name | Resource URI (relative path after API URI) | HTTP method or custom operation | Description (service operation) |
|---|---|---|---|
| Session Event Subscriptions (Collection) | /session-event-subscriptions | POST | This is a pseudo resource. |

#### 6.3.3.2 Resource: Session Event Subscriptions

##### 6.3.3.2.1 Description

##### 6.3.3.2.2 Resource Definition

Resource URI: **{apiRoot}/mmtel-callevent/<apiVersion>/session-event-subscriptions**

This resource shall support the resource URI variables defined in table 6.3.3.2.2-1.

**Table 6.3.3.2.2-1: Resource URI variables for this resource**

| Name | Data type | Definition |
|---|---|---|
| apiRoot | string | See clause 6.3.1 |

##### 6.3.3.2.3 Resource Standard Methods

###### 6.3.3.2.3.1 POST

This method shall support the URI query parameters specified in table 6.3.3.2.3.1-1.

**Table 6.3.3.2.3.1-1: URI query parameters supported by the POST method on this resource**

| Name | Data type | P | Cardinality | Description | Applicability |
|---|---|---|---|---|---|
| n/a | | | | | |

This method shall support the request data structures specified in table 6.3.3.2.3.1-2 and the response data structures and response codes specified in table 6.3.3.2.3.1-3.

**Table 6.3.3.2.3.1-2: Data structures supported by the POST Request Body on this resource**

| Data type | P | Cardinality | Description |
|---|---|---|---|
| Any | | | |

**Table 6.3.3.2.3.1-3: Data structures supported by the POST Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| n/a | | | | |
| NOTE: The mandatory HTTP error status code for the POST method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [12] also apply. | | | | |

##### 6.3.3.2.4 Resource Custom Operations

None.

### 6.3.4 Custom Operations without associated resources

None in this release of the specification.

### 6.3.5 Notifications

#### 6.3.5.1 General

Notifications shall comply to clause 6.2 of 3GPP TS 29.500 [12] and clause 4.6.2.3 of 3GPP TS 29.501 [3].

**Table 6.3.5.1-1: Notifications overview**

| Notification | Callback URI | HTTP method or custom operation | Description (service operation) |
|---|---|---|---|
| Session Event Notification | {SessionEventNotificationUri} | POST | Report the session event received. |

## 6.3.5.2 Session Event Notification

### 6.3.5.2.1 Description

The Session Event Notification is used by the MMTel Enabler Server to report the received session event to the Application Server.

### 6.3.5.2.2 Target URI

The Callback URI "{SessionEventNotificationUri}" shall be used with the callback URI variables defined in table 6.3.5.2.2-1.

**Table 6.3.5.2.2-1: Callback URI variables**

| Name | Definition |
|---|---|
| SessionEventNotificationUri | The notification URI of the Service Consumer (i.e., Application Server) to receive the session events.<br><br>In this release, the SessionEventNotificationUri of the Service Consumer is locally configured in the MMTel Enabler Server. |

### 6.3.5.2.3 Standard Methods

#### 6.3.5.2.3.1 POST

This method shall support the request data structures specified in table 6.3.5.2.3.1-1 and the response data structures and response codes specified in table 6.3.5.2.3.1-1.

**Table 6.3.5.2.3.1-1: Data structures supported by the POST Request Body**

| Data type | P | Cardinality | Description |
|---|---|---|---|
| ImsSessionEventNotification | M | 1 | The session event notification to the Application Server. |

**Table 6.3.5.2.3.1-2: Data structures supported by the POST Response Body**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| n/a | | | 204 No Content | This case represents a successful notification of the event. |
| ProblemDetails | O | 0..1 | 404 Not Found | Indicates the session event notification has failed due to application error.<br><br>The "cause" attribute may be used to indicate one of the following application errors:<br>- USER_NOT_FOUND, e.g. if the Application Server does not serve this service user;<br>- NOTIFICATION_URI_NOT_FOUND, if the Application Server considers the "SessionEventNotificationUri" is not recognized. |
| n/a | | | 307 Temporary Redirect | Temporary redirection.<br><br>The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer towards which the notification should be sent.<br><br>Redirection handling is described in clause 5.2.10 of 3GPP TS 29.222 [9]. |
| n/a | | | 308 Permanent Redirect | Permanent redirection.<br><br>The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer towards which the notification should be sent.<br><br>Redirection handling is described in clause 5.2.10 of 3GPP TS 29.222 [9]. |
| NOTE 1: The mandatory HTTP error status codes for the POST method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [12] also apply. | | | | |

**Table 6.3.5.2.3-3: Headers supported by the 307 Response Code on this endpoint**

| Name | Data type | P | Cardinality | Description |
|---|---|---|---|---|
| Location | string | M | 1 | A URI pointing to the endpoint of the NF service consumer instance to which the request should be sent. For the case, when a request is redirected to the same target resource via a different SCP, see clause 6.30.9.1 in 3GPP TS 29.500 [12]. |

**Table 6.3.5.2.3-4: Headers supported by the 308 Response Code on this endpoint**

| Name | Data type | P | Cardinality | Description |
|---|---|---|---|---|
| Location | string | M | 1 | A URI pointing to the endpoint of the NF service consumer instance to which the request should be sent. For the case, when a request is redirected to the same target resource via a different SCP, see clause 6.30.9.1 in 3GPP TS 29.500 [12]. |

## 6.3.6 Data Model

### 6.3.6.1 General

This clause specifies the application data model supported by the API.

Table 6.3.6.1-1 specifies the data types defined for the MMTel_CallEvent API.

**Table 6.3.6.1-1: MMTel_CallEvent specific Data Types**

| Data type | Clause defined | Description |
|---|---|---|
| | | |

Table 6.3.6.1-2 specifies data types re-used by the MMTel_CallEvent API from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the MMTel_CallEvent API.

**Table 6.3.6.1-2: MMTel_CallEvent re-used Data Types**

| Data type | Reference | Comments |
|---|---|---|
| ImsSessionEventNotification | 3GPP TS 29.175 [13] | Represents the IMS Session Notification. |

### 6.3.6.2 Structured data types

No specific structures for the MMTel_CallEvent service are specified in this clause.

## 6.3.7 Error Handling

### 6.3.7.1 General

For the MMTel_CallEvent API, HTTP error responses shall be supported as specified in clause 5.2.6 of 3GPP TS 29.222 [9]. Protocol errors and application errors specified in clause 5.2.6 of 3GPP TS 29.222 [9] shall be supported for the HTTP status codes specified in table 5.2.6-1 of 3GPP TS 29.122 [2].

In addition, the requirements in the following clauses are applicable for the MMTel_CallEvent API.

### 6.3.7.2 Protocol Errors

No specific protocol errors for the MMTel_CallEvent API are specified.

### 6.3.7.3 Application Errors

The application errors defined for the MMTel_CallEvent API are listed in Table 6.3.7.3-1.

**Table 6.3.7.3-1: Application errors**

| Application Error | HTTP status code | Description |
|---|---|---|
| | | |

## 6.3.8 Feature negotiation

The optional features in table 6.1.8-1 are defined for the MMTel_CallEvent API. They shall be negotiated using the extensibility mechanism defined in clause 5.2.7 of 3GPP TS 29.122 [2].

**Table 6.3.8-1: Supported Features**

| Feature number | Feature Name | Description |
|---|---|---|
| | | |

## 6.3.9 Security

The provisions of clause 6 of 3GPP TS 29.122 [2] shall apply for the MMTel_CallEvent API.

# 6.4 MMTel_CallControl API

## 6.4.1 Introduction

The Nnef_MMTel_CallControl service shall use the MMTel_CallControl API.

The API URI of the MMTel_CallControl API shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URIs used in HTTP requests shall have the Resource URI structure defined in clause 5.2.4 of 3GPP TS 29.222 [9], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificResourceUriPart>**

with the following components:

- The {apiRoot} shall be set as described in clause 5.2.4 of 3GPP TS 29.222 [9].
- The <apiName> shall be "mmtel-callcontrol".
- The <apiVersion> shall be "v1".
- The <apiSpecificResourceUriPart> shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [2].

## 6.4.2 Usage of HTTP and common API related aspects

The provisions of clause 5.2 of 3GPP TS 29.122 [2] shall apply for the MMTel_CallEvent API.

## 6.4.3 Resources

### 6.4.3.1 Overview

This clause describes the structure for the Resource URIs as shown in figure 6.4.3.1-1 and the resources and HTTP methods used for the MMTel_CallControl API.

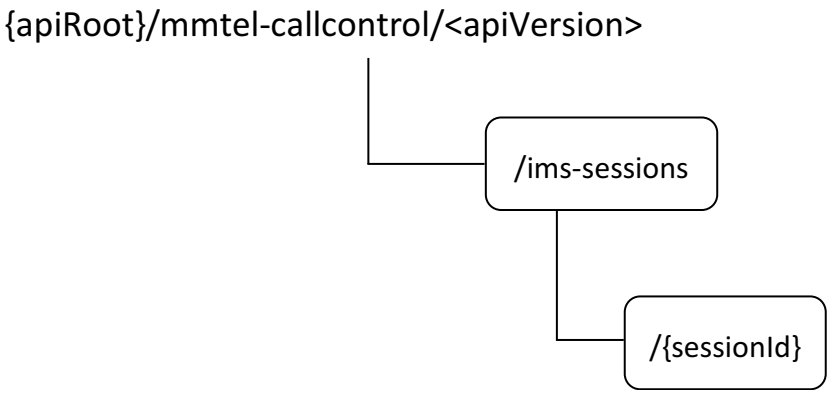


**Figure 6.4.3.1-1: Resource URI structure of the MMTel_CallControl API**

Table 6.4.3.1-1 provides an overview of the resources and applicable HTTP methods.

**Table 6.4.3.1-1: Resources and methods overview**

| Resource name | Resource URI (relative path after API URI) | HTTP method or custom operation | Description (service operation) |
|---|---|---|---|
| IMS Sessions | /ims-sessions | POST | Create a new IMS Session at the MMTel Enabler Server. |
| Individual IMS Session | /ims-sessions/{sessionId} | PUT | Update an existing "Individual IMS Session" resource. |
| | | PATCH | Modify an existing "Individual IMS Session" resource. |
| | | DELETE | Delete an existing "Individual IMS Session" resource. |

## 6.4.3.2 Resource: IMS Sessions

### 6.4.3.2.1 Description

This resource represents the collection of IMS Sessions managed by the MMTel Enabler Server.

The resource is modelled with the Collection resource archetype (see clause C.2 of 3GPP TS 29.501 [3]).

### 6.4.3.2.2 Resource Definition

Resource URI: **{apiRoot}/mmtel-callcontrol/<apiVersion>/ims-sessions**

This resource shall support the resource URI variables defined in table 6.4.3.2.2-1.

**Table 6.4.3.2.2-1: Resource URI variables for this resource**

| Name | Data type | Definition |
|---|---|---|
| apiRoot | string | See clause 6.4.1. |

### 6.4.3.2.3 Resource Standard Methods

#### 6.4.3.2.3.1 POST

The HTTP POST method enables an AF to request the creation of a new IMS Session at the MMTel Enabler Server.

This method shall support the URI query parameters specified in table 6.4.3.2.3.1-1.

**Table 6.4.3.2.3.1-1: URI query parameters supported by the POST method on this resource**

| Name | Data type | P | Cardinality | Description | Applicability |
|---|---|---|---|---|---|
| n/a | | | | | |

This method shall support the request data structures specified in table 6.4.3.2.3.1-2 and the response data structures and response codes specified in table 6.4.3.2.3.1-3.

**Table 6.4.3.2.3.1-2: Data structures supported by the POST Request Body on this resource**

| Data type | P | Cardinality | Description |
|---|---|---|---|
| ImsSession | M | 1 | Contains the parameters to request the creation of a new IMS Session. |

**Table 6.4.3.2.3.1-3: Data structures supported by the POST Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| ImsSession | M | 1 | 201 Created | Successful response. The "Individual IMS Session" resource is successfully created and a representation of the created resource is returned in the response body.<br><br>The URI of the created resource shall be returned in an HTTP "Location" header. |
| ProblemDetails | O | 0..1 | 403 Forbidden | (NOTE 2) |
| NOTE 1: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply.<br>NOTE 2: Failure cases are described in clause 6.4.7. | | | | |

**Table 6.4.3.2.3.1-4: Headers supported by the 201 response code on this resource**

| Name | Data type | P | Cardinality | Description |
|---|---|---|---|---|
| Location | string | M | 1 | Contains the URI of the newly created resource, according to the structure:<br>{apiRoot}/mmtel-callcontrol/<apiVersion>/ims-sessions/{sessionId} |

### 6.4.3.2.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

## 6.4.3.3 Resource: Individual IMS Session

### 6.4.3.3.1 Description

This resource represents an "Individual IMS Session" resource managed by the MMTel Enabler Server.

This resource is modelled with the Document resource archetype (see clause C.1 of 3GPP TS 29.501 [3]).

### 6.4.3.3.2 Resource Definition

Resource URI: **{apiRoot}/mmtel-callcontrol/<apiVersion>/ims-sessions/{sessionId}**

This resource shall support the resource URI variables defined in table 6.4.3.3.2-1.

**Table 6.4.3.3.2-1: Resource URI variables for this resource**

| Name | Data type | Definition |
|---|---|---|
| apiRoot | string | See clause 6.4.1. |
| sessionId | string | Represents the identifier of the "Individual IMS Session" resource. |

### 6.4.3.3.3 Resource Standard Methods

#### 6.4.3.3.3.1 PUT

The HTTP PUT method enables an AF to request the update of an existing "Individual IMS Session" resource at the MMTel Enabler Server.

This method shall support the URI query parameters specified in table 6.4.3.3.3.1-1.

**Table 6.4.3.3.3.1-1: URI query parameters supported by the PUT method on this resource**

| Name | Data type | P | Cardinality | Description | Applicability |
|---|---|---|---|---|---|
| n/a | | | | | |

This method shall support the request data structures specified in table 6.4.3.3.3.1-2 and the response data structures and response codes specified in table 6.4.3.3.3.1-3.

**Table 6.4.3.3.3.1-2: Data structures supported by the PUT Request Body on this resource**

| Data type | P | Cardinality | Description |
|---|---|---|---|
| ImsSession | M | 1 | Represents the updated "Individual IMS Session" resource representation. |

**Table 6.4.3.3.3.1-3: Data structures supported by the PUT Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| ImsSession | M | 1 | 200 OK | Successful response. The "Individual IMS Session" resource is successfully updated and a representation of the updated resource is returned in the response body. |
| n/a | | | 204 No Content | Successful response. The "Individual IMS Session" resource is successfully updated and no content is returned in the response body. |
| n/a | | | 307 Temporary Redirect | Temporary redirection.<br><br>The response shall include a Location header field containing an alternative target URI of the resource located in an alternative MMTel Enabler Server.<br><br>Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a | | | 308 Permanent Redirect | Permanent redirection.<br><br>The response shall include a Location header field containing an alternative target URI of the resource located in an alternative MMTel Enabler Server.<br><br>Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| ProblemDetails | O | 0..1 | 403 Forbidden | (NOTE 2) |
| NOTE 1: The mandatory HTTP error status codes for the HTTP PUT method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply.<br>NOTE 2: Failure cases are described in clause 6.4.7. | | | | |

**Table 6.4.3.3.3.1-4: Headers supported by the 307 Response Code on this resource**

| Name | Data type | P | Cardinality | Description |
|---|---|---|---|---|
| Location | string | M | 1 | Contains an alternative target URI of the resource located in an alternative MMTel Enabler Server. |

**Table 6.4.3.3.3.1-5: Headers supported by the 308 Response Code on this resource**

| Name | Data type | P | Cardinality | Description |
|---|---|---|---|---|
| Location | string | M | 1 | Contains an alternative target URI of the resource located in an alternative MMTel Enabler Server. |

### 6.4.3.3.3.2 PATCH

The HTTP PATCH method enables an AF to request the modification of an existing "Individual IMS Session" resource at the MMTel Enabler Server.

This method shall support the URI query parameters specified in table 6.4.3.3.3.2-1.

**Table 6.4.3.3.3.2-1: URI query parameters supported by the PATCH method on this resource**

| Name | Data type | P | Cardinality | Description | Applicability |
|---|---|---|---|---|---|
| n/a | | | | | |

This method shall support the request data structures specified in table 6.4.3.3.3.2-2 and the response data structures and response codes specified in table 6.4.3.3.3.2-3.

**Table 6.4.3.3.3.2-2: Data structures supported by the PATCH Request Body on this resource**

| Data type | P | Cardinality | Description |
|---|---|---|---|
| PatchItem | M | 1 | Represents the requested modifications to the "Individual IMS Session" resource. |

**Table 6.4.3.3.3.2-3: Data structures supported by the PATCH Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| ImsSession | M | 1 | 200 OK | Successful response. The "Individual IMS Session" resource is successfully modified and a representation of the updated resource is returned in the response body. |
| n/a | | | 204 No Content | Successful response. The "Individual IMS Session" resource is successfully modified and no content is returned in the response body. |
| n/a | | | 307 Temporary Redirect | Temporary redirection.<br><br>The response shall include a Location header field containing an alternative target URI of the resource located in an alternative MMTel Enabler Server.<br><br>Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a | | | 308 Permanent Redirect | Permanent redirection.<br><br>The response shall include a Location header field containing an alternative target URI of the resource located in an alternative MMTel Enabler Server.<br><br>Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| ProblemDetails | O | 0..1 | 403 Forbidden | (NOTE 2) |
| NOTE 1: The mandatory HTTP error status codes for the HTTP PATCH method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply.<br>NOTE 2: Failure cases are described in clause 6.4.7. | | | | |

**Table 6.4.3.3.3.2-4: Headers supported by the 307 Response Code on this resource**

| Name | Data type | P | Cardinality | Description |
|---|---|---|---|---|
| Location | string | M | 1 | Contains an alternative URI of the resource located on an alternative MMTel Enabler Server. |

**Table 6.4.3.3.3.2-5: Headers supported by the 308 Response Code on this resource**

| Name | Data type | P | Cardinality | Description |
|---|---|---|---|---|
| Location | string | M | 1 | Contains an alternative URI of the resource located on an alternative MMTel Enabler Server. |

NOTE 1: In this release, PATCH method for IMS session update is not supported and will be applied after ImsSessionPatch data structure is defined in 3GPP TS 29.522 [14].

#### 6.4.3.3.3.3 DELETE

The HTTP DELETE method enables an AF to request the deletion of an existing "Individual IMS Session" resource at the MMTel Enabler Server.

This method shall support the URI query parameters specified in table 6.4.3.3.3.3-1.

**Table 6.4.3.3.3.3-1: URI query parameters supported by the DELETE method on this resource**

| Name | Data type | P | Cardinality | Description | Applicability |
|---|---|---|---|---|---|
| n/a | | | | | |

This method shall support the request data structures specified in table 6.4.3.3.3.3-2 and the response data structures and response codes specified in table 6.4.3.3.3.3-3.

**Table 6.4.3.3.3.3-2: Data structures supported by the DELETE Request Body on this resource**

| Data type | P | Cardinality | Description |
|---|---|---|---|
| n/a | | | |

**Table 6.4.3.3.3.3-3: Data structures supported by the DELETE Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| n/a | | | 204 No content | Successful response. The "Individual IMS Session" resource is successfully deleted. |
| n/a | | | 307 Temporary Redirect | Temporary redirection.<br><br>The response shall include a Location header field containing an alternative target URI of the resource located in an alternative MMTel Enabler Server.<br><br>Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a | | | 308 Permanent Redirect | Permanent redirection.<br><br>The response shall include a Location header field containing an alternative target URI of the resource located in an alternative MMTel Enabler Server.<br><br>Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE 1: The mandatory HTTP error status codes for the HTTP DELETE method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

**Table 6.4.3.3.3.3-4: Headers supported by the 307 Response Code on this resource**

| Name | Data type | P | Cardinality | Description |
|---|---|---|---|---|
| Location | string | M | 1 | Contains an alternative URI of the resource located on an alternative MMTel Enabler Server. |

**Table 6.4.3.3.3.3-5: Headers supported by the 308 Response Code on this resource**

| Name | Data type | P | Cardinality | Description |
|---|---|---|---|---|
| Location | string | M | 1 | Contains an alternative URI of the resource located on an alternative MMTel Enabler Server. |

#### 6.4.3.3.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

### 6.4.4 Custom Operations without associated resources

There are no resource custom operations defined for this resource in this release of the specification.

### 6.4.5 Notifications

#### 6.4.5.1 General

Notifications shall comply to clause 5.2.5 of 3GPP TS 29.222 [9].

**Table 6.4.5.1-1: Notifications overview**

| Notification | Callback URI | HTTP method or custom operation | Description (service operation) |
|---|---|---|---|
| IMS Session Notification | {notifUri} | POST | Enable the MMTel Enabler Server to notify a previously subscribed Application Server on IMS Session related event(s). |

#### 6.4.5.2 IMS Session Notification

##### 6.4.5.2.1 Description

The IMS Session Notification is used by the MMTel Enabler Server to report IMS session related event(s) to a previously subscribed Application Server.

##### 6.4.5.2.2 Target URI

The Callback URI **"{notifUri}"** shall be used with the callback URI variables defined in table 6.4.5.2.2-1.

**Table 6.4.5.2.2-1: Callback URI variables**

| Name | Definition |
|---|---|
| notifUri | Represents the callback URI encoded as a string formatted as a URI. |

##### 6.4.5.2.3 Operation Definition

This method shall support the request data structures specified in table 6.4.5.2.3-1 and the response data structures and response codes specified in table 6.4.5.2.3-2.

**Table 6.4.5.2.3-1: Data structures supported by the POST Request Body on this resource**

| Data type | P | Cardinality | Description |
|---|---|---|---|
| ImsSessionEvent Notification | M | 1 | Contains the IMS Session Notification. |

**Table 6.4.5.2.3-2: Data structures supported by the POST Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| n/a | | | 204 No Content | Successful case. The IMS Session Notification is successfully received and acknowledged. |
| n/a | | | 307 Temporary Redirect | Temporary redirection.<br><br>The response shall include a Location header field containing an alternative URI representing the end point of an alternative AF towards which the notification should be sent.<br><br>Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a | | | 308 Permanent Redirect | Permanent redirection.<br><br>The response shall include a Location header field containing an alternative URI representing the end point of an alternative AF towards which the notification should be sent.<br><br>Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

**Table 6.4.5.2.3-3: Headers supported by the 307 Response Code on this resource**

| Name | Data type | P | Cardinality | Description |
|---|---|---|---|---|
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative AF towards which the notification should be redirected. |

**Table 6.4.5.2.3-4: Headers supported by the 308 Response Code on this resource**

| Name | Data type | P | Cardinality | Description |
|---|---|---|---|---|
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative AF towards which the notification should be redirected. |

## 6.4.6 Data Model

### 6.4.6.1 General

This clause specifies the application data model supported by the API.

Table 6.4.6.1-1 specifies the data types defined for the MMTel_CallControl service-based interface protocol.

**Table 6.4.6.1-1: MMTel_CallControl specific Data Types**

| Data type | Clause defined | Description | Applicability |
|---|---|---|---|
| | | | |

Table 6.4.6.1-2 specifies data types re-used by the MMTel_CallControl API from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the MMTel_CallControl API.

**Table 6.4.6.1-2: MMTel_CallControl re-used Data Types**

| Data type | Reference | Comments | Applicability |
|---|---|---|---|
| ImsSessionEventNotification | 3GPP TS 29.175 [13] | Represents the IMS Session Notification. | |
| ImsSession | 3GPP TS 29.522 [14] | Represent an IMS Session. | |
| PatchItem | 3GPP TS 29.571 [7] | Represents the requested modifications to an IMS Session. | |

### 6.4.6.2 Structured data types

#### 6.4.6.2.1 Introduction

This clause defines the structured data types to be used in resource representations.

### 6.4.6.3 Simple data types and enumerations

#### 6.4.6.3.1 Introduction

This clause defines simple data types and enumerations that can be referenced from data structures defined in the previous clauses.

#### 6.4.6.3.2 Simple data types

The simple data types defined in table 6.4.6.3.2-1 shall be supported.

**Table 6.4.6.3.2-1: Simple data types**

| Type Name | Type Definition | Description | Applicability |
|---|---|---|---|
| | | | |

## 6.4.7 Error Handling

### 6.4.7.1 General

For the MMTel_CallEvent API, HTTP error responses shall be supported as specified in clause 5.2.6 of 3GPP TS 29.122 [2]. Protocol errors and application errors specified in clause 5.2.6 of 3GPP TS 29.122 [2] shall be supported for the HTTP status codes specified in table 5.2.6-1 of 3GPP TS 29.122 [2].

In addition, the requirements in the following clauses are applicable for the MMTel_CallEvent API.

### 6.4.7.2 Protocol Errors

No specific protocol errors for the MMTel_CallEvent API are specified.

### 6.4.7.3 Application Errors

The application errors defined for the MMTel_CallEvent API are listed in Table 6.4.7.3-1.

**Table 6.3.7.3-1: Application errors**

| Application Error | HTTP status code | Description |
|---|---|---|
| | | |

## 6.4.8 Feature negotiation

The optional features in table 6.1.8-1 are defined for the MMTel_CallEvent API. They shall be negotiated using the extensibility mechanism defined in clause 5.2.7 of 3GPP TS 29.122 [2].

**Table 6.4.8-1: Supported Features**

| Feature number | Feature Name | Description |
|---|---|---|
| | | |

## 6.4.9 Security

The provisions of clause 6 of 3GPP TS 29.122 [2] shall apply for the MMTel_CallEvent API.

# 7 Using Common API Framework

## 7.1 General

When CAPIF is used with a MMTel Enabler Server service, the MMTel Enabler Server shall support the following functionalities as defined in 3GPP TS 29.222 [9]:

- the API exposing function and the related APIs over CAPIF-2/2e and CAPIF-3/3e reference points;
- the API publishing function and the related APIs over CAPIF-4/4e reference point;
- the API management function and the related APIs over CAPIF-5/5e reference point; and
- at least one of the security methods for authentication and authorization, and the related security mechanisms.

In a centralized deployment as defined in 3GPP TS 23.222 [8], where the CAPIF core function and the API provider domain functions are co-located, the interactions between the CAPIF core function and the API provider domain functions may be independent of the CAPIF-3/3e, CAPIF-4/4e and CAPIF-5/5e reference points.

When CAPIF is used with a MMTel Enabler Server service, the MMTel Enabler Server shall register all the northbound APIs features in the CAPIF Core Function.

## 7.2 Security

When CAPIF is used for external exposure, before invoking an API exposed by the MMTel Enabler Server, the service API consumer (e.g., Controlling Application Server) acting as an API invoker shall negotiate the security method (PKI, TLS-PSK or OAuth 2.0) with the CAPIF core function and ensure that the MMTel Enabler Server has enough credentials to authenticate the service API consumer (e.g. <provide examples of service consumers>), as defined in clauses 5.6.2.2 and 6.2.2.2 of 3GPP TS 29.222 [9].

If PKI or TLS-PSK is selected as the security method to be used between the service API consumer (e.g., Controlling Application Server) and the MMTel Enabler Server, upon API invocation, the MMTel Enabler Server shall retrieve the authorization information from the CAPIF core function as described in clause 5.6.2.4 of 3GPP TS 29.222 [9].

As indicated in 3GPP TS 33.122 [10], the access to the MMTel Enabler Server APIs may be authorized by means of the OAuth 2.0 protocol (see IETF RFC 6749 [11]), using the "Client Credentials" authorization grant, where the CAPIF core function (see 3GPP TS 29.222 [9]) plays the role of the authorization server.

NOTE 1: In this release, only "Client Credentials" authorization grant is supported.

If OAuth 2.0 is selected as the security method to be used between the service API consumer (e.g., Controlling Application Server) and the MMTel Enabler Server, the service API consumer (e.g., Controlling Application Server) shall, prior to consuming the services offered by the MMTel Enabler Server APIs, obtain a "token" from the authorization server, by invoking the Obtain_Authorization service operation as described in clause 5.6.2.3.2 of 3GPP TS 29.222 [9].

The MMTel Enabler Server APIs do not define any scopes for OAuth 2.0 authorization. It is the MMTel Enabler Server responsibility to check whether the service API consumer (e.g., Controlling Application Server) is authorized to use an API based on the provided "token". Once the MMTel Enabler Server verifies the "token", it shall check whether the MMTel Enabler Server identifier in the "token" matches its own published identifier, and whether the API name in the "token" matches its own published API name. If those checks are passed, the service API consumer (e.g., Controlling Application Server) has full authority to access any resource or operation provided by the invoked API.

NOTE 2: For the aforementioned security methods, the MMTel Enabler Server needs to apply admission control according to access control policies after performing the authorization checks.

# Annex A (normative): OpenAPI specification

## A.1 General

This Annex specifies the formal definition of the API(s) defined in the present specification. It consists of OpenAPI specifications in YAML format.

This Annex takes precedence when being discrepant to other parts of the specification with respect to the encoding of information elements and methods within the API(s).

NOTE 1: The semantics and procedures, as well as conditions, e.g. for the applicability and allowed combinations of attributes or values, not expressed in the OpenAPI definitions but defined in other parts of the specification also apply.

Informative copies of the OpenAPI specification files contained in this 3GPP Technical Specification are available on a Git-based repository that uses the GitLab software version control system (see clause 5.3.1 of 3GPP TS 29.501 [3] and clause 5B of 3GPP TR 21.900 [5]).

# A.2 MMTel_DCAppManagement API

```
openapi: 3.0.0

info:
  title: MMTel DC Application Management Service
  version: 1.0.0
  description: |
    MMTel DC Application Management Service.
    © 2025, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.

externalDocs:
  description: >
    3GPP TS 29.392 V19.0.0;
    Application layer support for MMTel;
    MMTel Enabler Server Services;Stage 3.
  url: http://www.3gpp.org/ftp/Specs/archive/29_series/29.392/

servers:
  - url: '{apiRoot}/mmtel-dcappmgmt/v1'
    variables:
      apiRoot:
        default: https://example.com
        description: apiRoot as defined in clause 5.2.4 of 3GPP TS 29.122

security:
  - {}
  - oAuth2ClientCredentials: []

paths:
  /dcapps/configure:
    post:
      summary: Request the creation of a new DC application management configuration.
      operationId: CreateDCAppMgmt
      tags:
        - DC Application Management Configurations
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/DcAppConfigReq'
      responses:
        '201':
          description: >
            Created. The DC application and DC application profile configuration is successfully
            created and a representation of the created Individual DC application and DC application
            profile Configuration shall be returned in the response body.
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/DcAppConfigResp'
        '307':
          $ref: 'TS29122_CommonData.yaml#/components/responses/307'
        '308':
          $ref: 'TS29122_CommonData.yaml#/components/responses/308'
        '400':
          $ref: 'TS29122_CommonData.yaml#/components/responses/400'
        '401':
          $ref: 'TS29122_CommonData.yaml#/components/responses/401'
        '403':
          $ref: 'TS29122_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29122_CommonData.yaml#/components/responses/404'
        '411':
          $ref: 'TS29122_CommonData.yaml#/components/responses/411'
        '413':
          $ref: 'TS29122_CommonData.yaml#/components/responses/413'
        '415':
          $ref: 'TS29122_CommonData.yaml#/components/responses/415'
        '429':
          $ref: 'TS29122_CommonData.yaml#/components/responses/429'
        '500':
          $ref: 'TS29122_CommonData.yaml#/components/responses/500'
        '503':
          $ref: 'TS29122_CommonData.yaml#/components/responses/503'
```

```
      default:
        $ref: 'TS29122_CommonData.yaml#/components/responses/default'

  /dcapps/update:
    post:
      summary: Request the updae of a DC application management configuration.
      operationId: UpdateDCAppMgmt
      tags:
        - DC Application Management Configurations Update
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/DcAppUpdateReq'
      responses:
        '200':
          description: >
            Updated. The DC application and DC application profile configuration is successfully
            updated.
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/DcAppStatResp'
        '307':
          $ref: 'TS29122_CommonData.yaml#/components/responses/307'
        '308':
          $ref: 'TS29122_CommonData.yaml#/components/responses/308'
        '400':
          $ref: 'TS29122_CommonData.yaml#/components/responses/400'
        '401':
          $ref: 'TS29122_CommonData.yaml#/components/responses/401'
        '403':
          $ref: 'TS29122_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29122_CommonData.yaml#/components/responses/404'
        '411':
          $ref: 'TS29122_CommonData.yaml#/components/responses/411'
        '413':
          $ref: 'TS29122_CommonData.yaml#/components/responses/413'
        '415':
          $ref: 'TS29122_CommonData.yaml#/components/responses/415'
        '429':
          $ref: 'TS29122_CommonData.yaml#/components/responses/429'
        '500':
          $ref: 'TS29122_CommonData.yaml#/components/responses/500'
        '503':
          $ref: 'TS29122_CommonData.yaml#/components/responses/503'
        default:
          $ref: 'TS29122_CommonData.yaml#/components/responses/default'

  /dcapps/delete:
    post:
      summary: Request the delete of a DC application management configuration.
      operationId: DeleteDCAppMgmt
      tags:
        - DC Application Management Configurations Delete
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/DcAppIdReq'
      responses:
        '200':
          description: >
            Deleted. The DC application and DC application profile configuration is successfully
            deleted.
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/DcAppIdResp'
        '307':
          $ref: 'TS29122_CommonData.yaml#/components/responses/307'
        '308':
          $ref: 'TS29122_CommonData.yaml#/components/responses/308'
        '400':
          $ref: 'TS29122_CommonData.yaml#/components/responses/400'
```

```
        '401':
          $ref: 'TS29122_CommonData.yaml#/components/responses/401'
        '403':
          $ref: 'TS29122_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29122_CommonData.yaml#/components/responses/404'
        '411':
          $ref: 'TS29122_CommonData.yaml#/components/responses/411'
        '413':
          $ref: 'TS29122_CommonData.yaml#/components/responses/413'
        '415':
          $ref: 'TS29122_CommonData.yaml#/components/responses/415'
        '429':
          $ref: 'TS29122_CommonData.yaml#/components/responses/429'
        '500':
          $ref: 'TS29122_CommonData.yaml#/components/responses/500'
        '503':
          $ref: 'TS29122_CommonData.yaml#/components/responses/503'
        default:
          $ref: 'TS29122_CommonData.yaml#/components/responses/default'

  /dcapps/retrieval:
    post:
      summary: Request the retrieval of a DC application management configuration.
      operationId: RetrievalDCAppMgmt
      tags:
        - DC Application Management Configurations Retrieval
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/DcAppIdReq'
      responses:
        '200':
          description: >
            The requested DC application profile related information is returned.
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/DcAppIdResp'
        '307':
          $ref: 'TS29122_CommonData.yaml#/components/responses/307'
        '308':
          $ref: 'TS29122_CommonData.yaml#/components/responses/308'
        '400':
          $ref: 'TS29122_CommonData.yaml#/components/responses/400'
        '401':
          $ref: 'TS29122_CommonData.yaml#/components/responses/401'
        '403':
          $ref: 'TS29122_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29122_CommonData.yaml#/components/responses/404'
        '411':
          $ref: 'TS29122_CommonData.yaml#/components/responses/411'
        '413':
          $ref: 'TS29122_CommonData.yaml#/components/responses/413'
        '415':
          $ref: 'TS29122_CommonData.yaml#/components/responses/415'
        '429':
          $ref: 'TS29122_CommonData.yaml#/components/responses/429'
        '500':
          $ref: 'TS29122_CommonData.yaml#/components/responses/500'
        '503':
          $ref: 'TS29122_CommonData.yaml#/components/responses/503'
        default:
          $ref: 'TS29122_CommonData.yaml#/components/responses/default'


components:
  securitySchemes:
    oAuth2ClientCredentials:
      type: oauth2
      flows:
        clientCredentials:
          tokenUrl: '{tokenUrl}'
          scopes: {}
```

```
  schemas:

#
# STRUCTURED DATA TYPES
#

    DcAppConfigReq:
      description: >
        Represents the DC application and profile configuration request.
      type: object
      properties:
        reqId:
          type: string
        secCred:
          type: string
        dcAppNum:
          type: integer
        dcAppConfigParamList:
          type: array
          items:
            $ref: '#/components/schemas/DcAppConfigParameters'
          minItems: 1
      required:
        - reqId
        - dcAppNum
        - dcAppConfigParamList

    DcAppConfigParameters:
      description: >
        Represents the parameters of single-DC applicaion in the configuration request.
      type: object
      properties:
        appIndex:
          type: string
        appName:
          type: string
        svcType:
          type: string
        appIconUrl:
          $ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'
        appVer:
          type: string
        appVal:
          $ref: 'TS29122_CommonData.yaml#/components/schemas/DateTime'
        appLoadPh:
          $ref: '#/components/schemas/AppLoadPhase'
        autoload:
          type: boolean
        autolaunch:
          type: boolean
        peerDcReq:
          type: boolean
        suppScnr:
          $ref: '#/components/schemas/SupportScenario'
        cond:
          $ref: '#/components/schemas/Condition'
        qosReq:
          type: string
        persDataColl:
          type: boolean
        persDataCollInfoUrl:
          $ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'
        appPkg:
          $ref: 'TS29122_CommonData.yaml#/components/schemas/Binary'
      required:
        - appIndex

    DcAppConfigResp:
      description: >
        Represents the DC application and profile configuration response.
      type: object
      properties:
        dcAppConfigRespList:
          type: array
          items:
            $ref: '#/components/schemas/DcAppConfigResponseParameters'
          minItems: 1
      required:
```

```
      - dcAppConfigRespList

    DcAppConfigResponseParameters:
      description: >
        Represents the parameters of single-DC applicaion in the configuration response.
      type: object
      properties:
        appIndex:
          type: string
        status:
          $ref: '#/components/schemas/Status'
        appId:
          type: string
        failureCause:
          type: string
      required:
        - appIndex
        - status

    DcAppUpdateReq:
      description: >
        Represents the DC application and profile update request.
      type: object
      properties:
        reqId:
          type: string
        secCred:
          type: string
        dcAppNum:
          type: integer
        dcAppUpdateParamList:
          type: array
          items:
            $ref: '#/components/schemas/DcAppUpdateParameters'
          minItems: 1
      required:
        - reqId
        - dcAppNum
        - dcAppUpdateParamList

    DcAppUpdateParameters:
      description: >
        Represents the parameters of single-DC applicaion in the update response.
        appId:
          type: string
        appName:
          type: string
        svcType:
          type: string
        appIconUrl:
          $ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'
        appVer:
          type: string
        appVal:
          $ref: 'TS29122_CommonData.yaml#/components/schemas/DateTime'
        appLoadPh:
          $ref: '#/components/schemas/AppLoadPhase'
        autoload:
          type: boolean
        autolaunch:
          type: boolean
        peerDcReq:
          type: boolean
        suppScnr:
          $ref: '#/components/schemas/SupportScenario'
        cond:
          $ref: '#/components/schemas/Condition'
        qosReq:
          type: string
        persDataColl:
          type: boolean
        persDataCollInfoUrl:
          $ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'
        appPkg:
          $ref: 'TS29122_CommonData.yaml#/components/schemas/Binary'
      required:
        - appId
```

```
    DcAppStatResp:
      description: >
        Represents the DC application and profile update response or DC application delete response.
      type: object
      properties:
        dcAppStatRespList:
          type: array
          items:
            $ref: '#/components/schemas/DcAppResponseParameters'
          minItems: 1
      required:
        - dcAppStatRespList

    DcAppResponseParameters:
      description: >
        Represents the parameters of single-DC applicaion in the DC application and
        profile update response and DC application delete response.
      type: object
      properties:
        appId:
          type: string
        status:
          $ref: '#/components/schemas/Status'
        failureCause:
          type: string
      required:
        - appId
        - status

    DcAppIdReq:
      description: >
        Represents the DC application delete request and DC application information
        retrieval request.
      type: object
      properties:
        reqId:
          type: string
        secCred:
          type: string
        dcAppNum:
          type: integer
        appIdList:
          type: array
          items:
            type: string
          minItems: 1
      required:
        - reqId
        - dcAppNum
        - appIdList

    DcAppIdResp:
      description: >
        Represents the DC application profile information retrieval response.
      type: object
      properties:
        status:
          $ref: '#/components/schemas/Status'
        secCred:
          type: string
        dcAppInfoList:
          type: array
          items:
            $ref: '#/components/schemas/DcAppUpdateParameters'
          minItems: 1
      required:
        - status



# SIMPLE DATA TYPES
#

#
# ENUMERATIONS
#

    AppLoadPhase:
```

```
      anyOf:
      - type: string
        enum:
           - PRECALL_ONLY
           - INCALL
           - PRECALL_AND_INCALL
      - type: string
        description: >
          This string provides forward-compatibility with future extensions to the enumeration but
          is not used to encode content defined in the present version of this API.
      description: |
        Represents the load phase of the DC application.
        It complies with the provisions defined in Table 6.1.6.3.3-1 of 3GPP TS 29.392.
        Possible values are:
        - PRECALL_ONLY: Indicates the Data Channel Application is allowed to be used before
          the MMTel call session is established.
        - INCALL: Indicates that the Data Channel Application is allowed to be used after
          the MMTel call session is established.
        - PRECALL_AND_INCALL: Indicateds that the Data Channel Application is allowed to be
          used during the entire Precall and incall.

    SupportScenario:
      anyOf:
      - type: string
        enum:
           - VOICE_CALL_ONLY
           - VIDEO_CALL_ONLY
           - VOICE_AND_VIDEO_CALL
      - type: string
        description: >
          This string provides forward-compatibility with future extensions to the enumeration but
          is not used to encode content defined in the present version of this API.
      description: |
        Represents the support scenario of the DC application.
        It complies with the provisions defined in Table 6.1.6.3.4-1 of 3GPP TS 29.392.
        Possible values are:
        - VOICE_CALL_ONLY: Indicates the Data Channel Application can be used if and only
          if the corresponding call is a voice call.
        - VIDEO_CALL_ONLY: Indicates that the Data Channel Application can be used if
          and only if the corresponding call is a video call.
        - VOICE_AND_VIDEO_CALL: Indicateds that the Data Channel Application can be used
          in both voice call and video call.

    Status:
      anyOf:
      - type: string
        enum:
           - SUCCESS
           - FAILED
      - type: string
        description: >
          This string provides forward-compatibility with future extensions to the enumeration but
          is not used to encode content defined in the present version of this API.
      description: |
        Represents the request return status.
        It complies with the provisions defined in Table 6.1.6.3.5-1 of 3GPP TS 29.392.
        Possible values are:
        - SUCCESS: Indicates that the request is processed successfully.
        - FAILED: Indicates that the request fails to be processed.

    Condition:
      anyOf:
      - type: string
        enum:
           - CONDTY
           - CONDVA
      - type: string
        description: >
          This string provides forward-compatibility with future extensions to the enumeration but
          is not used to encode content defined in the present version of this API.
      description: |
        Represents the conditions used by the DC application.
        It complies with the provisions defined in Table 6.1.6.3.6-1 of 3GPP TS 29.392.
        Possible values are:
        - CONDTY: Indicates the Data Channel Application is allowed to be used in this
          condition, e.g. Service area.
        - CONDVA: Indicates the value of the CONFTY.
```

# A.3 MMTel_DCAppCall API

```
openapi: 3.0.0

info:
  title: MMTel_DCAppCall
  version: 1.0.0
  description: |
    MMTel Enabler Server DC Application Call Service.
    © 2025, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.

externalDocs:
  description: |
    3GPP TS 29.392 V19.0.0;
    Application layer support for MMTel; MMTel Enabler Server Services; Stage 3.
  url: https://www.3gpp.org/ftp/Specs/archive/29_series/29.392/

servers:
  - url: '{apiRoot}/mmtel-dcappcall/v1'
    variables:
      apiRoot:
        default: https://example.com
        description: apiRoot as defined in clause 5.2.4 of 3GPP TS 29.122

security:
  - {}
  - oAuth2ClientCredentials:
    - mmtel-dcappcall

paths:
  /dccall:
    post:
      summary: Request to Establish a call with DC capability.
      tags:
        - Custom Operation (No Resource)
      operationId: createDcCall
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/DcCallReq'
      responses:
        '200':
          description: >
            Call establishment successful
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/DcCallResp'
        '307':
          description: Temporary Redirect
          headers:
            Location:
              description: Resource URI of the alternative MMTel Enabler Server
              schema:
                type: string
                format: uri
          content: {}
        '308':
          description: Permanent Redirect
          headers:
            Location:
              description: Resource URI of the alternative MMTel Enabler Server
              schema:
                type: string
                format: uri
          content: {}
        '400':
          $ref: 'TS29122_CommonData.yaml#/components/responses/400'
        '401':
          $ref: 'TS29122_CommonData.yaml#/components/responses/401'
        '403':
          $ref: 'TS29122_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29122_CommonData.yaml#/components/responses/404'
```

```
        '409':
          $ref: 'TS29122_CommonData.yaml#/components/responses/409'
        '411':
          $ref: 'TS29122_CommonData.yaml#/components/responses/411'
        '413':
          $ref: 'TS29122_CommonData.yaml#/components/responses/413'
        '415':
          $ref: 'TS29122_CommonData.yaml#/components/responses/415'
        '429':
          $ref: 'TS29122_CommonData.yaml#/components/responses/429'
        '500':
          $ref: 'TS29122_CommonData.yaml#/components/responses/500'
        '503':
          $ref: 'TS29122_CommonData.yaml#/components/responses/503'
        default:
          $ref: 'TS29122_CommonData.yaml#/components/responses/default'
      callbacks:
        DcMediaNotification:
          '{$request.body#/notificationInfo}':
            post:
              requestBody:
                required: true
                content:
                  application/json:
                    schema:
                      $ref: '#/components/schemas/DcMediaNotifyReq'
              responses:
                '200':
                  description: >
                    Call establishment successful
                  content:
                    application/json:
                      schema:
                        $ref: '#/components/schemas/DcMediaNotifyResp'
                '307':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/307'
                '308':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/308'
                '400':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/400'
                '401':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/401'
                '403':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/403'
                '404':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/404'
                '411':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/411'
                '413':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/413'
                '415':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/415'
                '429':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/429'
                '500':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/500'
                '503':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/503'
                default:
                  $ref: 'TS29122_CommonData.yaml#/components/responses/default'

  /update-dc-media:
    post:
      summary: Update DC media of an existing session.
      tags:
        - Custom Operation (No Resource)
      operationId: updateDcMedia
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/DcMediaUpdateReq'
      responses:
        '200':
          description: >
            Call establishment successful
          content:
```

```
            application/json:
              schema:
                $ref: '#/components/schemas/DcMediaUpdateResp'
        '307':
          description: Temporary Redirect
          headers:
            Location:
              description: Resource URI of the alternative MMTel Enabler Server
              schema:
                type: string
                format: uri
          content: {}
        '308':
          description: Permanent Redirect
          headers:
            Location:
              description: Resource URI of the alternative MMTel Enabler Server
              schema:
                type: string
                format: uri
          content: {}
        '400':
          $ref: 'TS29122_CommonData.yaml#/components/responses/400'
        '401':
          $ref: 'TS29122_CommonData.yaml#/components/responses/401'
        '403':
          $ref: 'TS29122_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29122_CommonData.yaml#/components/responses/404'
        '409':
          $ref: 'TS29122_CommonData.yaml#/components/responses/409'
        '411':
          $ref: 'TS29122_CommonData.yaml#/components/responses/411'
        '413':
          $ref: 'TS29122_CommonData.yaml#/components/responses/413'
        '415':
          $ref: 'TS29122_CommonData.yaml#/components/responses/415'
        '429':
          $ref: 'TS29122_CommonData.yaml#/components/responses/429'
        '500':
          $ref: 'TS29122_CommonData.yaml#/components/responses/500'
        '503':
          $ref: 'TS29122_CommonData.yaml#/components/responses/503'
        default:
          $ref: 'TS29122_CommonData.yaml#/components/responses/default'


components:
  securitySchemes:
    oAuth2ClientCredentials:
      type: oauth2
      flows:
        clientCredentials:
          tokenUrl: '{tokenUrl}'
          scopes: {}

  schemas:

    # DC call establishment request
    DcCallReq:
      type: object
      required:
        - terminatingId
        - notificationInfo
        - callType
      properties:
        originatingId:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
        terminatingId:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
        mediaInfo:
          type: array
          items:
            type: string
          minItems: 1
        dcMediaInfo:
          type: boolean
```

```
        description: Indicator of whether DC media is to be used
      appProfileRequested:
        $ref: 'TS29392_MMTel_DCAppManagement.yaml#/components/schemas/DcAppUpdateParameters'
      notificationInfo:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
      callType:
        $ref: '#/components/schemas/CallType'
  # DC call establishment response
  DcCallResp:
    type: object
    required:
      - callResult
      - terminatingId
      - callType
    properties:
      callResult:
        type: string
        enum: [SUCCESS, FAILED]
        description: Result of call establishment
      sessionId:
        type: string
        description: Call session identifier, maps to callSessionId in OMA Third Party Call API
      failureCause:
        type: string
        description: Cause of call establishment failure
      originatingId:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
      terminatingId:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
      mediaInfo:
        type: array
        items:
          type: string
        description: Negotiated media types
        minItems: 1
      dcMediaInfo:
        type: string
        description: DC media activation status
      appProfileRequested:
        $ref: 'TS29392_MMTel_DCAppManagement.yaml#/components/schemas/DcAppUpdateParameters'
      callType:
        $ref: '#/components/schemas/CallType'
  # DC media update request
  DcMediaUpdateReq:
    type: object
    required:
      - dcAppId
      - sessionId
      - notificationInfo
    properties:
      dcAppId:
        type: string
        description: Unique identifier of the DC application
      sessionId:
        type: string
        description: Identifier of the session to be updated
      mediaResourceInfo:
        type: object
        description: Media information to be transmitted via the Data Channel
      appProfileRequested:
        $ref: 'TS29392_MMTel_DCAppManagement.yaml#/components/schemas/DcAppUpdateParameters'
      notificationInfo:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
      mediaDirection:
        $ref: '#/components/schemas/AdcType'
  # DC media update response
  DcMediaUpdateResp:
    type: object
    required:
      - sessionId
      - result
    properties:
      sessionId:
        type: string
        description: Session identifier
      result:
        type: string
        description: Result of the update request
```

```
        cause:
          type: string
          description: Cause of update request failure
    # DC media notification request
    DcMediaNotifyReq:
      type: object
      required:
        - sessionId
        - mediaResourceInfo
      properties:
        sessionId:
          type: string
          description: Session identifier
        mediaResourceInfo:
          type: object
          description: Media information transmitted via the Data Channel
        mediaDirection:
          $ref: '#/components/schemas/AdcType'
    # DC media notification response
    DcMediaNotifyResp:
      type: object
      required:
        - sessionId
        - result
      properties:
        sessionId:
          type: string
          description: Session identifier
        result:
          type: string
          description: Result of notification receipt
        cause:
          type: string
          description: Cause of notification processing failure

#
# SIMPLE DATA TYPES
#

#
# ENUMERATIONS
#

    AdcType:
      description: >
        The type of the data channel media direction.
        Possible values are:
        - A2P: Presenting Data Channel initiated by Application.
        - P2P: Presenting Data Channel initiated by UE.
      anyOf:
        - type: string
          enum:
            - A2P
            - P2A
        - type: string
          description: >
            This string provides forward-compatibility with future extensions to the enumeration
            and is not used to encode content defined in the present version of this API.

    CallType:
      description: >
        Indicate the type of established call.
        Possible values are:
        - A2P: Presenting the call as Application call initiated by Application to UE.
        - P2P: Presenting the call as Third Party call established between two UEs.
      anyOf:
        - type: string
          enum:
            - A2P
            - P2P
        - type: string
          description: >
            This string provides forward-compatibility with future extensions to the enumeration
            and is not used to encode content defined in the present version of this API.
```

# A.4 MMTel_CallEvent API

```
openapi: 3.0.0

info:
  title: MMTel_CallEvent
  version: 1.0.0
  description: |
    MMTel Enabler Server Call Event Service.
    © 2025, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.

externalDocs:
  description: >
    3GPP TS 29.392 V19.0.0;
    Application layer support for MMTel; MMTel Enabler Server Services; Stage 3.
  url: https://www.3gpp.org/ftp/Specs/archive/29_series/29.392/

servers:
  - url: '{apiRoot}/mmtel-callevent/v1'
    variables:
      apiRoot:
        default: https://example.com
        description: apiRoot as defined in clause 5.2.4 of 3GPP TS 29.122

security:
  - {}
  - oAuth2ClientCredentials:
    - mmtel-callevent

paths:
  /session-event-subscriptions:
    post:
    # This is a pseudo operation, Application Server shall NOT invoke this method!
      summary: MMTel_CallEvent Subscribe service operation, pseudo operation
      tags:
        - Session Event Subscriptions (Collection)
      operationId: Subscribe
      requestBody:
        required: true
        content:
          application/json:
            # Unspecified schema for the JSON body, since this is not used by consumer or producer.
            schema: {}
      responses:
        default:
          $ref: 'TS29571_CommonData.yaml#/components/responses/default'

      callbacks:
        ImsSessionEventNotification:
          '{SessionEventNotificationUri}':
            post:
              requestBody:
                required: true
                content:
                  application/json:
                    schema:
                      $ref:
'TS29175_Nimsas_ImsSessionManagement.yaml#/components/schemas/ImsSessionEventNotification'
              responses:
                '204':
                  description: No Content, notification was succesfull.
                '307':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/307'
                '308':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/308'
                '400':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/400'
                '401':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/401'
                '403':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/403'
                '404':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/404'
                '411':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/411'
                '413':
```

```
                $ref: 'TS29571_CommonData.yaml#/components/responses/413'
              '415':
                $ref: 'TS29571_CommonData.yaml#/components/responses/415'
              '429':
                $ref: 'TS29571_CommonData.yaml#/components/responses/429'
              '500':
                $ref: 'TS29571_CommonData.yaml#/components/responses/500'
              '502':
                $ref: 'TS29571_CommonData.yaml#/components/responses/502'
              '503':
                $ref: 'TS29571_CommonData.yaml#/components/responses/503'
              default:
                $ref: 'TS29571_CommonData.yaml#/components/responses/default'

components:

  securitySchemes:
    oAuth2ClientCredentials:
      type: oauth2
      flows:
        clientCredentials:
          tokenUrl: '{nrfApiRoot}/oauth2/token'
          scopes:
            mmtel-callevent: Access to the MMTel_CallEvent API
```

# A.5 MMTel_CallControl API

```
openapi: 3.0.0

info:
  title: MMTel_CallControl
  version: 1.0.0
  description: |
    MMTel Enabler Server Call Control Service.
    © 2025, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.

externalDocs:
  description: >
    3GPP TS 29.392 V19.0.0;
    Application layer support for MMTel; MMTel Enabler Server Services; Stage 3.
  url: https://www.3gpp.org/ftp/Specs/archive/29_series/29.392/

servers:
  - url: '{apiRoot}/mmtel-callcontrol/v1'
    variables:
      apiRoot:
        default: https://example.com
        description: apiRoot as defined in clause 5.2.4 of 3GPP TS 29.122

security:
  - {}
  - oAuth2ClientCredentials:
    - mmtel-callcontrol

paths:
  /ims-sessions:
    post:
      summary: Create IMS Session
      operationId: ImsSessionCreate
      tags:
        - IMS Sessions (Collection)
      requestBody:
        description: Creates a new Individual IMS Session resource.
        required: true
        content:
          application/json:
            schema:
              $ref: 'TS29522_ImsSessionManagement.yaml#/components/schemas/ImsSession'
      responses:
        '201':
          description: >
            The creation of an Individual IMS Session resource is confirmed and
            a representation of that resource is returned.
          content:
```

```
            application/json:
              schema:
                $ref: 'TS29522_ImsSessionManagement.yaml#/components/schemas/ImsSession'
          headers:
            Location:
              description: >
                The URI of the newly created resource, according to the structure:
                {apiRoot}/mmtel-callcontrol/<apiVersion>/ims-sessions/{sessionId}.
              schema:
                type: string
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '401':
          $ref: 'TS29571_CommonData.yaml#/components/responses/401'
        '403':
          $ref: 'TS29571_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '406':
          $ref: 'TS29571_CommonData.yaml#/components/responses/406'
        '411':
          $ref: 'TS29571_CommonData.yaml#/components/responses/411'
        '413':
          $ref: 'TS29571_CommonData.yaml#/components/responses/413'
        '415':
          $ref: 'TS29571_CommonData.yaml#/components/responses/415'
        '429':
          $ref: 'TS29571_CommonData.yaml#/components/responses/429'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        '501':
          $ref: 'TS29571_CommonData.yaml#/components/responses/501'
        '503':
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          $ref: 'TS29571_CommonData.yaml#/components/responses/default'
      callbacks:
        ImsSessionEventNotification:
          '{$request.body#/notifUri}':
            post:
              requestBody:
                required: true
                content:
                  application/json:
                    schema:
                      $ref:
'TS29175_Nimsas_ImsSessionManagement.yaml#/components/schemas/ImsSessionEventNotification'
              responses:
                '204':
                  description: >
                    No Content. The IMS session notification is successfully
                    received and acknowledged.
                '307':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/307'
                '308':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/308'
                '400':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/400'
                '401':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/401'
                '403':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/403'
                '404':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/404'
                '411':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/411'
                '413':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/413'
                '415':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/415'
                '429':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/429'
                '500':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/500'
                '503':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/503'
                default:
                  $ref: 'TS29122_CommonData.yaml#/components/responses/default'
```

```
  /ims-sessions/{sessionId}:
    put:
      summary: Update an existing Individual IMS Session resource.
      operationId: ImsSessionUpdate
      tags:
        - Individual IMS Session
      parameters:
        - name: sessionId
          in: path
          description: Identifies an individual IMS session.
          required: true
          schema:
            type: string
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: 'TS29522_ImsSessionManagement.yaml#/components/schemas/ImsSession'
      responses:
        '200':
          description: >
            OK. The Individual IMS Session resource is successfully updated and a representation
            of the updated resource is returned in the response body.
          content:
            application/json:
              schema:
                $ref: 'TS29522_ImsSessionManagement.yaml#/components/schemas/ImsSession'
        '204':
          description: >
            No Content. The Individual IMS Session Management resource is
            successfully updated and no content is returned in the response body.
        '307':
          $ref: 'TS29122_CommonData.yaml#/components/responses/307'
        '308':
          $ref: 'TS29122_CommonData.yaml#/components/responses/308'
        '400':
          $ref: 'TS29122_CommonData.yaml#/components/responses/400'
        '401':
          $ref: 'TS29122_CommonData.yaml#/components/responses/401'
        '403':
          $ref: 'TS29122_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29122_CommonData.yaml#/components/responses/404'
        '409':
          $ref: 'TS29122_CommonData.yaml#/components/responses/409'
        '411':
          $ref: 'TS29122_CommonData.yaml#/components/responses/411'
        '413':
          $ref: 'TS29122_CommonData.yaml#/components/responses/413'
        '415':
          $ref: 'TS29122_CommonData.yaml#/components/responses/415'
        '429':
          $ref: 'TS29122_CommonData.yaml#/components/responses/429'
        '500':
          $ref: 'TS29122_CommonData.yaml#/components/responses/500'
        '503':
          $ref: 'TS29122_CommonData.yaml#/components/responses/503'
        default:
          $ref: 'TS29122_CommonData.yaml#/components/responses/default'

    patch:
      summary: Update an existing Individual IMS Session resource.
      operationId: ImsSessionPatch
      tags:
        - Individual IMS Session patch update
      parameters:
        - name: sessionId
          in: path
          description: Identifies an individual IMS session.
          required: true
          schema:
            type: string
      requestBody:
        required: true
        content:
          application/merge-patch+json:
```

```
        schema:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/PatchItem'
    responses:
      '200':
        description: >
          OK. The "Individual IMS Session" resource is successfully modified and a
          representation of the updated resource is returned in the response body.
        content:
          application/json:
            schema:
              $ref: 'TS29522_ImsSessionManagement.yaml#/components/schemas/ImsSession'
      '204':
        description: >
          No Content. The "Individual IMS Session" resource is successfully modified
          and no content is returned in the response body.
      '307':
        $ref: 'TS29122_CommonData.yaml#/components/responses/307'
      '308':
        $ref: 'TS29122_CommonData.yaml#/components/responses/308'
      '400':
        $ref: 'TS29122_CommonData.yaml#/components/responses/400'
      '401':
        $ref: 'TS29122_CommonData.yaml#/components/responses/401'
      '403':
        $ref: 'TS29122_CommonData.yaml#/components/responses/403'
      '404':
        $ref: 'TS29122_CommonData.yaml#/components/responses/404'
      '411':
        $ref: 'TS29122_CommonData.yaml#/components/responses/411'
      '413':
        $ref: 'TS29122_CommonData.yaml#/components/responses/413'
      '415':
        $ref: 'TS29122_CommonData.yaml#/components/responses/415'
      '429':
        $ref: 'TS29122_CommonData.yaml#/components/responses/429'
      '500':
        $ref: 'TS29122_CommonData.yaml#/components/responses/500'
      '503':
        $ref: 'TS29122_CommonData.yaml#/components/responses/503'
      default:
        $ref: 'TS29122_CommonData.yaml#/components/responses/default'


  delete:
    summary: delete the IMS session
    operationId: ImsSessionDelete
    tags:
      - IMS Session Deletion
    parameters:
      - name: sessionId
        in: path
        description: Identifies an individual IMS session.
        required: true
        schema:
          type: string
    responses:
      '204':
        description: No content, successful delete of the resource identified by sessionId.
      '307':
        $ref: 'TS29571_CommonData.yaml#/components/responses/307'
      '308':
        $ref: 'TS29571_CommonData.yaml#/components/responses/308'
      '400':
        $ref: 'TS29571_CommonData.yaml#/components/responses/400'
      '401':
        $ref: 'TS29571_CommonData.yaml#/components/responses/401'
      '403':
        $ref: 'TS29571_CommonData.yaml#/components/responses/403'
      '404':
        $ref: 'TS29571_CommonData.yaml#/components/responses/404'
      '429':
        $ref: 'TS29571_CommonData.yaml#/components/responses/429'
      '500':
        $ref: 'TS29571_CommonData.yaml#/components/responses/500'
      '502':
        $ref: 'TS29571_CommonData.yaml#/components/responses/502'
      '503':
        $ref: 'TS29571_CommonData.yaml#/components/responses/503'
```

```
        default:
          $ref: 'TS29571_CommonData.yaml#/components/responses/default'

components:

  securitySchemes:
    oAuth2ClientCredentials:
      type: oauth2
      flows:
        clientCredentials:
          tokenUrl: '{tokenUrl}'
          scopes: {}
```

# Annex B (informative): Withdrawn API versions

## B.1 General

This Annex lists withdrawn API versions of the APIs defined in the present specification. 3GPP TS 29.501 [5] clause 4.3.1.6 describes the withdrawal of API versions.

## B.2 MMTel_DCAppManagement API

The API versions listed in table B.2-1 are withdrawn for the MMTel_DCAppManagement API.

**Table B.2-1: Withdrawn API versions of the MMTel_DCAppManagement service**

| API version number | Remarks |
|---|---|
| | |

## B.3 MMTel_DCAppCall API

The API versions listed in table B.3-1 are withdrawn for the MMTel_DCAppCall API.

**Table B.3-1: Withdrawn API versions of the MMTel_DCAppCall service**

| API version number | Remarks |
|---|---|
| | |

## B.4 MMTel_CallEvent API

The API versions listed in table B.4-1 are withdrawn for the MMTel_CallEvent API.

**Table B.4-1: Withdrawn API versions of the MMTel_CallEvent service**

| API version number | Remarks |
|---|---|
| | |

## B.5 MMTel_CallControl API

The API versions listed in table B.5-1 are withdrawn for the MMTel_CallControl API.

**Table B.5-1: Withdrawn API versions of the MMTel_CallControl service**

| API version number | Remarks |
|---|---|
| | |

# Annex C (informative): Change history

| Change history | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Date** | **Meeting** | **TDoc** | **CR** | **Rev** | **Cat** | **Subject/Comment** | **New version** |
| 2025-04 | CT3#140 | C3-251619 | | | | Based on the skeleton for the new MMTel Enabler Server Services TS (C3-251557).<br>Incorporates agreed pCRs C3-251558, C3-251559, C3-251560, C3-251561, C3-251562.<br>Editorial changes and corrections from the rapporteur. | 0.1.0 |
| 2025-09 | CT3#142 | C3-253654 | | | | Incorporates agreed pCRs C3-253338, C3-253455, C3-253456, C3-253457, C3-253458, C3-253604, C3-253704.<br>Editorial changes and corrections from the rapporteur. | 0.2.0 |
| 2025-09 | CT#109 | CP-252069 | | | | Presentation to TSG CT for information | 1.0.0 |
| 2025-11 | CT3#144 | C3-255664 | | | | Incorporates agreed pCRs C3-255436, C3-255437, C3-255438, C3-255439, C3-255440, C3-255441, C3-255625.<br>Editorial changes and corrections from the rapporteur. | 1.1.0 |
| 2025-12 | CT#110 | CP-253017 | | | | Presentation to TSG CT for approval | 2.0.0 |
| 2025-12 | CT#110 | CP-253017 | | | | Approved by TSG CT | 19.0.0 |

# History

| Version | Date | Status |
|---|---|---|
| V19.0.0 | February 2026 | Publication |
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