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Contents

Foreword

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1 Scope

The present specification provides the stage 3 definition of the Session Management Event Exposure Service (Nsmf_EventExposure) of the 5G System.

The stage 2 definition and procedures of the Session Management Event Exposure Service are contained in 3GPP TS 23.502 [3] and 3GPP TS 23.503 [6]. The 5G System Architecture is defined in 3GPP TS 23.501 [2].

Stage 3 call flows for policy and charging control use cases are provided in 3GPP TS 29.513 [7].

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

The Session Management Event Exposure Service is provided by the Session Management Function (SMF). This service exposes events related to PDU Sessions observed at the SMF.

2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

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

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

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

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

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

[6]   3GPP TS 23.503: "Policy and Charging Control Framework for the 5G System; Stage 2".

[7]   3GPP TS 29.513: "5G System; Policy and Charging Control signalling flows and QoS parameter mapping; Stage 3".

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

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

[10]   OpenAPI, "OpenAPI 3.0.0 Specification", https://github.com/OAI/OpenAPI-Specification/blob/master/versions/3.0.0.md

[11]   3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces Stage 3".

[12]   3GPP TS 29.510: "5G System; Network Function Repository Services; Stage 3".

[13]   3GPP TS 29.518: "5G System; Access and Mobility Management Services; Stage 3".

3 Definitions and abbreviations

3.1 Definitions

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

3.2 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].

AF	Application Function
AMBR	Aggregate Maximum Bit Rate
AMF	Access and Mobility Management Function
API	Application Programming Interface
DNAI	DN Access Identifier
DNN	Data Network Name
GUAMI	Globally Unique AMF Identifier
HTTP	Hypertext Transfer Protocol
JSON	JavaScript Object Notation
NEF	Network Exposure Function
NF	Network Function
SMF	Session Management Function
SUPI	Subscription Permanent Identifier
PCF	Policy Control Function
PRA	Presence Reporting Area
UPF	User Plane Function

4 Session Management Event Exposure Service

4.1 Service Description

4.1.1 Overview

The Session Management Event Exposure Service, as defined in 3GPP TS 23.502 [3] and 3GPP TS 23.503 [6], is provided by the Session Management Function (SMF).

This service:

- allows consumer NFs to subscribe and unsubscribe for events on a PDU session; and

- notifies consumer NFs with a corresponding subscription about observed events on the PDU session.

The types of observed events include:

- UPF change (Addition and/or removal of PDU session anchor);

  SMF change;

- Application traffic detection (start and stop);

- PDU session statistics (for example usage reporting);

- PDU session release; and

- Out of credit.

4.1.2   Service Architecture

The 5G System Architecture is defined in 3GPP TS 23.501 [2]. The Policy and Charging related 5G architecture is also described in 3GPP TS 29.513 [7].

The Session Management Event Exposure Service (Nsmf_EventExposure) is part of the Nsmf service-based interface exhibited by the Session Management Function (SMF),

Known consumer of the Nsmf_EventExposure_Notify service are:

- Policy Control Function (PCF)

- Network Exposure Function (NEF)

- Access and Mobility Management Function (AMF).

- Application Function (AF)

The PCF accesses the Session Management Event Exposure Service at the SMF via the N7 Reference point.

The AMF accesses the Session Management Event Exposure Service at the SMF via the N11 Reference point.
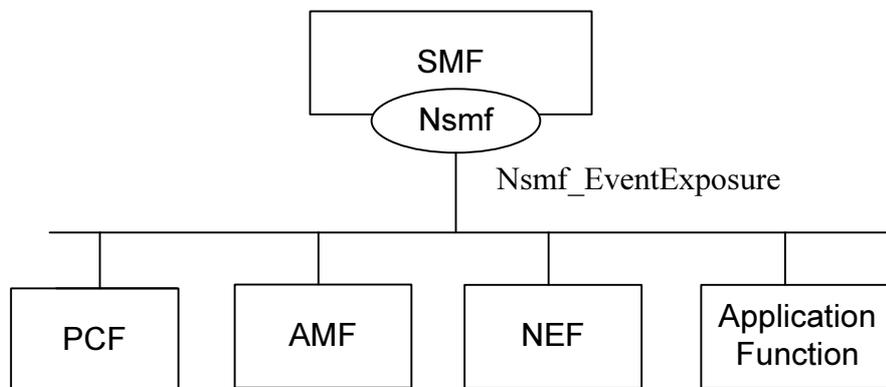
Figure 4.1.2-1: Reference Architecture for the Nsmf_EventExposure_Notify Service; SBI representation
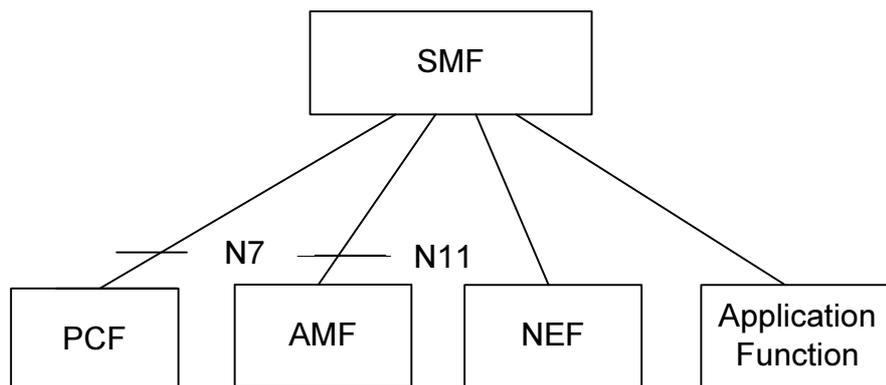
Figure 4.1.2-2: Reference Architecture for the Nsmf_EventExposure_Notify Service: reference point representation

4.1.3   Network Functions

4.1.3.1   Session Management Function (SMF)

The Session Management function (SMF) provides:

- Session Management e.g. Session establishment, modification and release;

- UE IP address allocation & management;

- Selection and control of UP function;

- Termination of interfaces towards Policy control functions; and

- Control part of policy enforcement and QoS.

4.1.3.2 NF Service Consumers

The Policy Control Function (PCF):

- Supports unified policy framework to govern network behaviour; and

- Provides policy rules to Control Plane function(s) that enforce them.

The Network Exposure Function (NEF);

- provides a means to securely expose the services and capabilities provided by 3GPP network functions for e.g. 3rd parties or internal exposure.

The Access and Mobility Management function (AMF) provides:

- Registration management;

- Connection management;

- Reachability management;

- Mobility Management; and

- Sending of UE Policy towards the served UE.

The Application Function (AF)

- interacts with the 3GPP Core Network to provide services.

4.2 Service Operations

4.2.1 Introduction

Table 4.2.1-1: Operations of the Nsmf_EventExposure_Notify Service

Service operation name	Description	Initiated by
Notify	Report UE PDU session related event(s) to the NF service consumer which has subscribed to the event report service.	SMF
Subscribe	This service operation is used by an NF service consumer to subscribe for event notifications on a specified PDU session, or for all PDU Sessions of one UE, a group of UE(s) or any UE, or to modify a subscription.	NF service consumer
UnSubscribe	This service operation is used by an NF service consumer to unsubscribe from event notifications.	NF service consumer

4.2.2 Nsmf_EventExposure_Notify Service Operation

4.2.2.1 General

The Nsmf_EventExposure_Notify service operation enables notification to NF service consumers that the previously subscribed event on the related PDU session occurred.

The following procedure using the Nsmf_EventExposure_Notify service operation is supported:

- notification about subscribed events.

4.2.2.2 Notification about subscribed events

Figure 4.2.2.2-1 illustrates the notification about subscribed events.
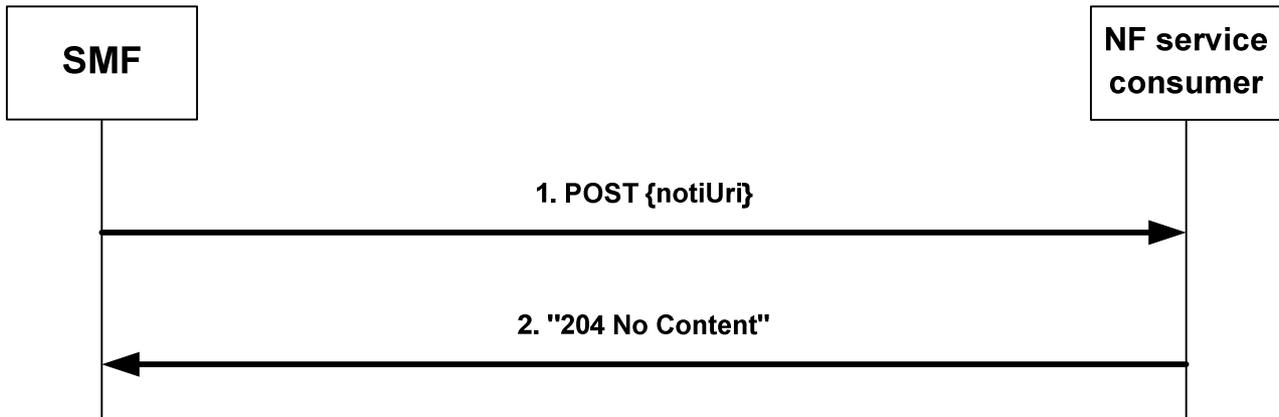
Figure 4.2.2.2-1: Notification about subscribed events

If the SMF observes PDU Session related event(s) for which an NF service consumer has subscribed to, the SMF shall send an HTTP POST request with "{notifUri}" as previously provided by the NF service consumer within the corresponding subscription as URI and Nsmf_EventExposure data structure as request body that shall include:

- Notification correlation ID provided by the NF service consumer during the subscription as "notifId" attribute; and

- information about the observed event(s) within the "eventNotifs" attribute that shall contain for each observed event an "EventNotification" data structure that shall include:

 1. the Event Trigger as "event" attribute;

 2. for a DNAI change notification:

 a) type of notification ("EARLY" or "LATE") as "dnaiChgType" attribute;

 b) source DNAI and target DNAI as "sourceDnai" attribute and "targetDnai" attribute, respectively; and

 c) if the PDU Session type is IP, for the source DNAI IP address/prefix of the UE as "sourceUeIpv4Addr" attribute or "sourceUeIpv6Prefix" attribute; and

 d) if the PDU Session type is IP, for the target DNAI IP address/prefix of the UE as "targetUeIpv4Addr" attribute or "targetUeIpv6Prefix" attribute;

 e) for the source DNAI, N6 traffic routing information related to the UE as "sourceTraRouting" attribute; and

 f) for the target DNAI, N6 traffic routing information related to the UE as "targetTraRouting" attribute;

 3. for a N6 traffic routing information change:

 a) if the PDU Session type is IP, IP address/prefix of the UE as "targetUeIpv4Addr" attribute or "targetUeIpv6Prefix" attribute; and

 b) N6 traffic routing information related to the UE as "targetTraRouting" attribute;

 4. for a UE IP address change:

 a) added new UE IP address or prefix as "adIpv4Addr" attribute or "adIpv6Prefix" attribute, respectively; and/or

 b) released UE IP address or prefix as "reIpv4Addr" attribute or "reIpv6Prefix" attribute, respectively;

 5. for an access type change:

    a) new access type as "accType" attribute;

  6. for a PLMN Change:

    a) new PLMN as "plmnId" attribute;

  7. for a PDU Session Release:

    a) ID of the released PDU session as "pduSeId" attribute; and

  8. the time at which the event was observed encoded as "timeStamp" attribute.

Upon the reception of the HTTP POST request with "{notifUri}" as URI and an Nsmf_EventExposure data structure as request body, the NF shall send an "204 No Content" HTTP response for a succesfull processing.

If the NF service consumer is not able to handle the Notification but knows by implementation specific means that another service consumer is able to handle the notification, it shall reply with an HTTP "307 temporary redirect" error response pointing to the new NF service consumer URI. If the NF service consumer is not able to handle the Notification but another unknown service consumer could possibly handle the notification, it shall reply with an HTTP "404 Not found" error response.

  NOTE: An AMF as service consumer can change.

If the SMF receives a "307 temporary redirect" response, the SMF shall use this URL as Notification URL in subsequent communication and shall resend the failed Notification to that URL.

If the SMF becomes aware that a new NF service consumer is requiring notifications (e.g. via the "404 Not found" response, or via Namf_Communication service AMFStatusChange Notifications, see 3GPP TS 29.518 [13], or via link level failures or via the Nnrf_NFDiscovery Service (using the service name and GUAMI obtained during the creation of the subscription) to query the other AMFs within the AMF set) specified in 3GPP TS 29.510 [12]), and the SMF knows alternate or backup IPv4 or IPv6 Addess(es) where to send Notifications (e.g. via "altNotifIpv4Addrs" or "altNotifIpv6Addrs" attributes received when the subscription was created), the SMF shall exchange the authority part of the Notification URL with one of those addresses and shall use that URL in subsequent communication. If the SMF received a "404 Not found" response, the SMF should resend the failed notification to that URL.

4.2.3   Nsmf_EventExposure_Subscribe Service Operation

4.2.3.1   General

This service operation is used by an NF service consumer to subscribe for event notifications on a specified PDU Session, or for all PDU Sessions of one UE, group of UE(s) or any UE, or to modify an existing subscription. The following are the types of events for which a subscription can be made:

-   DNAI change as described in 3GPP TS 23.501 [2], subclause 5.6.7;

-   N6 traffic routing information change

  NOTE: For example, the DNAI has not changed (the application instance remains the same) but some network event (e.g. a change of UPF) has induced a change of N6 traffic routing information

-   PDU Session release;

-   Change of Access Type;

-   PLMN change; and

-   UE IP address change.

The following procedures using the Nsmf_EventExposure_Subscribe service operation are supported:

-   creating a new subscription;

-   modifying an existing subscription.

4.2.3.2 Creating a new subscription

Figure 4.2.3.2-1 illustrates the creation of a subscription.
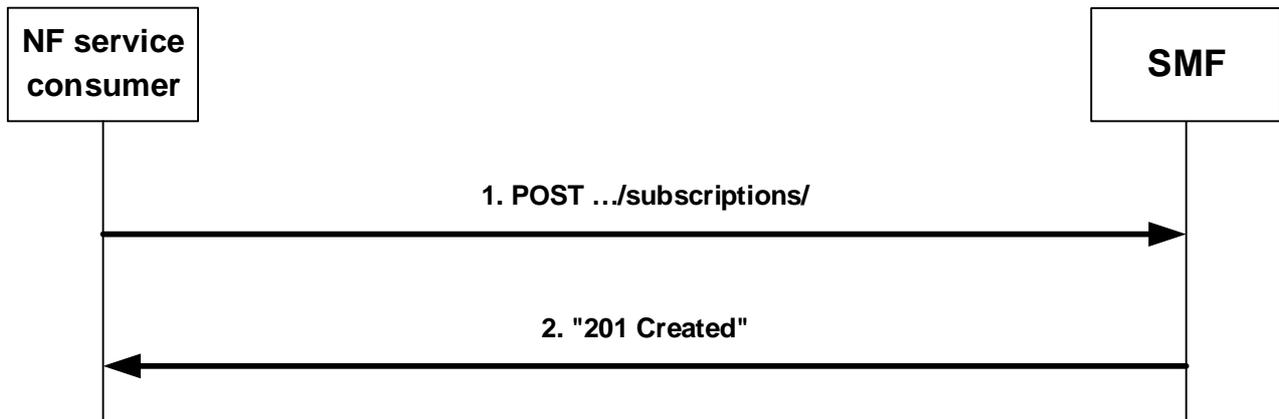
Figure 4.2.3.2-1: Creation of a subscription

To subscribe to event notifications, the NF service consumer shall send an HTTP POST request with: "{apiRoot}/nsmf-eventexposure/v1/subscriptions/" as Resource URI and the Nsmf_EventExposure data structure as request body that shall include:

- if the subscription applies to events related to a single PDU session, the PDU Session ID of that PDU session as "pduSeId" attribute;

- if the subscription applies to events not related to a single PDU session, identification of UEs to which the subscription applies via:

    a) identification of a single UE by SUPI as "supi" attribute;

    b) identification of a group of UE(s) via a "groupId" attribute; or

    c) identification of any UE using a specific DNN via the "dnn" attribute;

NOTE: The identification of any UE does not apply for local breakout roaming scenarios where the the SMF is located in the VPLMN and the NF service consumer is located in the HPLMN.

- an URI where to receive the requested notifications as "notifURI" attribute;

- a Notification Correlation Identifier assigned by the NF service consumer for the requested notifications as "notifId" attribute; and

- if the NF service consumer is an AMF, the GUAMI encoded as "guami" attribute:

- a description of the subscribed events as "eventSubs" attribute that for each event shall include:

    a) an event identifier as "event" attribute; and

    b) for event DNAI_CH (DNAI change), whether the subscription is for early, late, or early and late notifications of UP path reconfiguration in the "dnaiChType" attribute;

    and may include:

    a) event notification method (periodic, one time, on event detection) as "notifMethod" attribute;

    b) Maximum Number of Reports as "maxReportNbr" attribute;

    c) Monitoring Duration as "monDur" attribute; and

    d) Repetition Period for periodic reporting as "repPeriod" attribute.

The Nsmf_EventExposure data structure as request body may also include:

- Alternate or backup IPv4 Addess(es) where to send Notifications encoded as " altNotifIpv4Addrs" attribute;

- Alternate or backup IPv6 Addess(es) where to send Notifications encoded as " altNotifIpv6Addrs" attribute; and/or

- if the NF service consumer is an AMF, the name of a service produced by the AMF that expects to receive the notification about subscribed events encoded as "serviceName" attribute.

Upon the reception of an HTTP POST request with: "{apiRoot}/nsmf-eventexposure/v1/subscriptions/" as Resource URI and Nsmf_EventExposure data structure as request body, the SMF shall:

- create a new subscription;

- assign a subscription correlation ID;

- store the subscription; and

- send a HTTP "201 Created" response with Nsmf_EventExposure data structure as request body that shall include the assigned subscription correlation ID in the "subId" attribute.

If the SMF received an GUAMI, the SMF may subscribe to GUAMI changes using the AMFStatusChange service operation of the Namf_Communication service specified in 3GPP TS 29.518 [13], and it may use the Nnrf_NFDiscovery Service specified in 3GPP TS 29.510 [12] (using the obtained GUAMI and possibly service name) to query the other AMFs within the AMF set.

4.2.3.3 Modifying an existing subscription

Figure 4.2.3.3-1 illustrates the modification of an existing subscription.
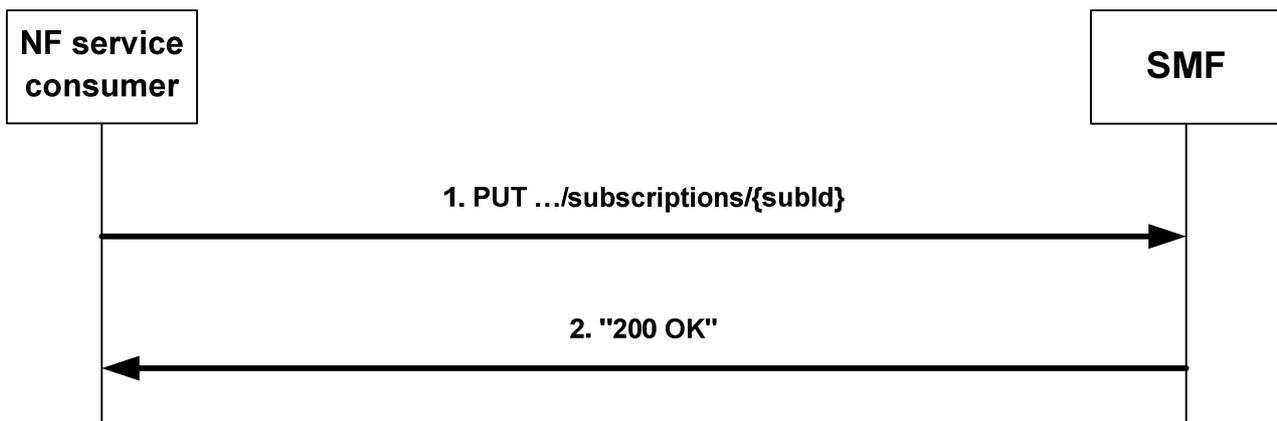
Figure 4.2.3.3-1: Modification of an existing subscription

To modify an existing subscription to event notifications, the NF service consumer shall send an HTTP PUT request with: "{apiRoot}/nsmf-eventexposure/v1/subscriptions/subId}" as Resource URI, where "{subId}" is the subscription correlation ID of the existing subscription, and Nsmf_EventExposure data structure as request body as described in subclause 4.2.3.2.

NOTE 1: An alternate NF service consumer than the one that requested the generation of the subscription resource can send the PUT. For instance, an AMF as service consumer can change.

NOTE 2: The "notifURI" attribute within the Nsmf_EventExposure data structure can be modified to request that subsequent notifications are sent to a new NF service consumer.

Upon the reception of an HTTP PUT request with: "{apiRoot}/nsmf-eventexposure/v1/subscriptions/{subId}" as Resource URI and Nsmf_EventExposure data structure as request body, the SMF shall:

- store the subscription; and

- send a HTTP "200 OK" response with Nsmf_EventExposure data structure as response body.

4.2.4 Nsmf_EventExposure_UnSubscribe Service Operation

4.2.4.1 General

This service operation is used by an NF service consumer to unsubscribe from event notifications.

The following procedure using the Nsmf_EventExposure_UnSubscribe service operation is supported:

- unsubscription from event notifications.

4.2.4.2 Unsubscription from event notifications

Figure 4.2.4.2-1 illustrates the unsubscription from event notifications.
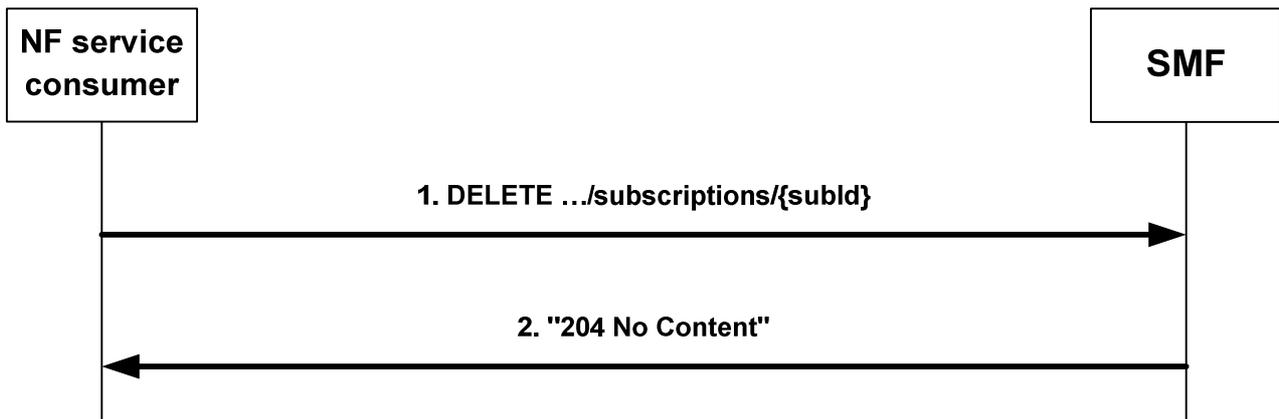
Figure 4.2.4.2-1: Unsubscription from event notifications

To unsubscribe from event notifications, the NF service consumer shall send an HTTP DELETE request with: "{apiRoot}/nsmf-eventexposure/v1/subscriptions/{subId}" as Resource URI, where "{subId}" is the subscription correlation ID of the existing subscription that is to be deleted.

Upon the reception of the HTTP DELETE request with: "{apiRoot}/nsmf-eventexposure/v1/subscriptions/{subId}" as Resource URI, the SMF shall:

- remove the corresponding subscription; and

- send an HTTP "204 No Content" response.

5 Nsmf_EventExposure API

5.1 Introduction

The Session Management Event Exposure Service shall use the Nsmf_EventExposure API.

The request URI used in HTTP request from the NF service consumer towards the SMF shall have the structure defined in subclause 4.4.1 of 3GPP TS 29.501 [2], i.e.:

{apiRoot}/{apiName}/{apiVersion}/{apiSpecificResourceUriPart}

with the following components:

- The {apiRoot} shall be set as described in 3GPP TS 29.501 [2].

- The {apiName} shall be "nsmf-event-exposure".

- The {apiVersion} shall be "v1".

- The {apiSpecificResourceUriPart} shall be set as described in subclause 5.3.

5.2 Usage of HTTP

5.2.1 General

HTTP/2, IETF RFC 7540 [8], shall be used as specified in clause 5 of 3GPP TS 29.500 [4].

HTTP/2 shall be transported as specified in subclause 5.3 of 3GPP TS 29.500 [4].

The OpenAPI [10] specification of HTTP messages and content bodies for the Nsmf_EventExposure is contained in Annex A.

5.2.2 HTTP standard headers

5.2.2.1 General

See subclause 5.2.2 of 3GPP TS 29.500 [4] for the usage of HTTP standard headers.

5.2.2.2 Content type

JSON, IETF RFC 8259 [9], shall be used as content type of the HTTP bodies specified in the present specification as specified in subclause 5.4 of 3GPP TS 29.500 [4].

5.2.3 HTTP custom headers

The mandatory HTTP custom header fields specified in subclause 5.2.3.2 of 3GPP TS 29.500 [4] shall be applicable.

5.3 Resources

5.3.1 Resource Structure

//{apiRoot}/nsmf-event-exposure/v1

/subscriptions

/{subId}
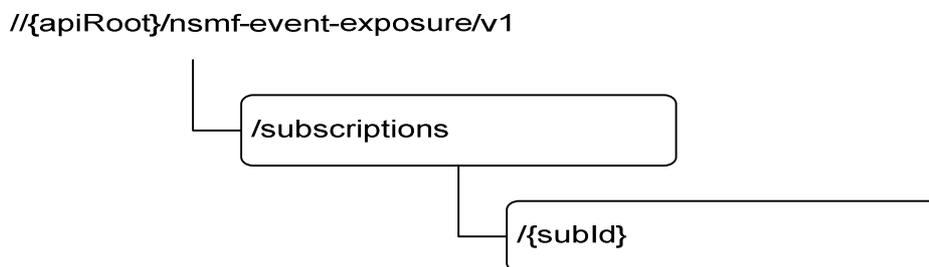
Figure 5.3.1-1: Resource URI structure of the Nsmf_EventExposure API

Table 5.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 5.3.1-1: Resources and methods overview

Resource name	Resource URI	HTTP method or custom operation	Description
SMF Notification Subscriptions	Nsmf-event-exposure/ v1/ subscriptions	POST	Create a new Individual SMF Notification Subscription resource.
Individual SMF Notification Subscription	Nsmf-event-exposure/ v1/ subscriptions/ {subId}	GET	Read an Individual SMF Notification Subscription resource.
		PUT	Modify an existing Individual SMF Notification Subscription resource.
		DELETE	Delete an Individual SMF Notification Subscription resource and cancel the related subscription.

5.3.2 Resource: SMF Notification Subscriptions

5.3.2.1 Description

The SMF Notification Subscriptions resource represents all subscriptions to the SMF event exposure service at a given SMF.

5.3.2.2 Resource definition

Resource URI: {apiRoot}/nsmf-event-exposure/v1/subscriptions/

This resource shall support the resource URI variables defined in table 5.3.2.2-1.

Table 5.3.2.2-1: Resource URI variables for this resource

Name	Definition
apiRoot	See subclause 5.1

5.3.2.3 Resource Standard Methods

5.3.2.3.1 POST

This method shall support the URI query parameters specified in table 5.3.2.3.1-1.

Table 5.3.2.3.1-1: URI query parameters supported by the POST method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 5.3.2.3.1-2 and the response data structures and response codes specified in table 5.3.2.3.1-3.

Table 5.3.2.3.1-2: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
Nsmf_EventExposure	M	1	Create a new Individual SMF Notification Subscription resource.

Table 5.3.2.3.1-3: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
Nsmf_EventExposure	M	1	201 Created	The creation of an Individual SMF Notification Subscription resource is confirmed and a representation of that resource is returned.
NOTE: The mandatory HTTP error status codes for the POST method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply.				

5.3.2.4 Resource Custom Operations

None.

5.3.3 Resource: Individual SMF Notification Subscription

5.3.3.1 Description

The SMF Notification Subscriptions resource represents a single subscription to the SMF event exposure service.

5.3.3.2 Resource definition

Resource URI: {apiRoot}/nsmf-event-exposure/v1/subscriptions/{subId}

This resource shall support the resource URI variables defined in table 5.3.3.2-1.

Table 5.3.3.2-1: Resource URI variables for this resource

Name	Definition
apiRoot	See subclause 5.1
subId	String identifying a subscription to the SMF event exposure service formatted as defined for the SubId type in table 5.6.3.2-1.

5.3.3.3 Resource Standard Methods

5.3.3.3.1 GET

This method shall support the URI query parameters specified in table 5.3.3.3.1-1.

Table 5.3.3.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 5.3.3.3.1-2 and the response data structures and response codes specified in table 5.3.3.3.1-3.

Table 5.3.3.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 5.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	P	Cardinality	Response codes	Description
Nsmf_EventExposure	M	1	200 OK	A representation of the SMF Notification Subscription matching the eventSubId is returned.
NOTE:	The mandatory HTTP error status codes for the GET method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply.			

5.3.3.3.2 PUT

This method shall support the URI query parameters specified in table 5.3.3.3.2-1.

Table 5.3.3.3.2-1: URI query parameters supported by the PUT method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 5.3.3.3.2-2 and the response data structures and response codes specified in table 5.3.3.3.2-3.

Table 5.3.3.3.2-2: Data structures supported by the PUT Request Body on this resource

Data type	P	Cardinality	Description
Nsmf_EventExposure	M	1	Modify the existing Individual SMF Notification Subscription resource matching the eventSubId according to the representation in the Nsmf_EventExposure

Table 5.3.3.3.2-3: Data structures supported by the PUT Response Body on this resource

Data type	P	Cardinality	Response codes	Description
Nsmf_EventExposure	M	1	200 OK	Successful case: The Individual SMF Notification Subscription resource matching the eventSubId was modified and a representation is returned.
n/a			204 No Content	Successful case: The Individual SMF Notification Subscription resource matching the eventSubId was modified.
NOTE:	The mandatory HTTP error status codes for the PUT method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply.			

5.3.3.3.3   DELETE

This method shall support the URI query parameters specified in table 5.3.3.3.3-1.

Table 5.3.3.3.3-1: URI query parameters supported by the DELETE method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 5.3.3.3.3-2 and the response data structures and response codes specified in table 5.3.3.3.3-3.

Table 5.3.3.3.3-2: Data structures supported by the DELETE Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 5.3.3.3.3-3: Data structures supported by the DELETE Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	Successful case: The Individual SMF Notification Subscription resource matching the subId was deleted.
NOTE:	The manadatory HTTP error status code for the DELETE method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply.			

5.3.3.4   Resource Custom Operations

None.

5.4   Custom Operations without associated resources

None.

5.5   Notifications

5.5.1   General

Notifications shall comply to subclause 6.2 of 3GPP TS 29.500 [4] and subclause 4.6.2.3 of 3GPP TS 29.501 [5].

5.5.2   Event Notification

5.5.2.1   Description

The Event Notification is used by the SMF to report one or several observed Events to a NF service consumer that has subscribed to such Notifications via the Individual SMF Notification Subscription Resource.

5.5.2.2 Target URI

The Notification URI **"{notifUri}"** shall be used with the resource URI variables defined in table 5.5.2.2-1.

Table 5.5.2.2-1: Resource URI variables for this resource

Name	Definition
notifUri	String formatted as URI with the Notification Uri as assigned within the Individual SMF Notification Subscription Resource and described within the Nsmf_EventExposure type (see table 5.6.2.2-1).

5.5.2.3 Standard Methods

5.5.2.3.1 POST

This method shall support the URI query parameters specified in table 5.5.2.3.1-1.

Table 5.5.2.3.1-1: URI query parameters supported by the POST method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 5.5.2.3.1-2 and the response data structures and response codes specified in table 5.5.2.3.1-3.

Table 5.5.2.3.1-2: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
Nsmf_EventExposureNotification	M	1	Provides Information about observed events

Table 5.5.2.3.1-3: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	The receipt of the Notification is acknowledged.
n/a			307 temporary redirect	The NF service consumer shall generate a Location header field containing a URI pointing to another NF service consumer to which the notification should be send.
ProblemDetails	M	1	404 Not Found	The NF service consumer can use this response when the notification can be sent to another host.
NOTE: The mandatory HTTP error status codes for the POST method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply.				

5.6 Data Model

5.6.1 General

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

Table 5.6.1-1 specifies the data types defined for the Nsmf_EventExposure service based interface protocol.

Table 5.6.1-1: Nsmf_EventExposure specific Data Types

Data type	Section defined	Description	Applicability
EventNotification	5.6.2.5	Describes notifications about a single event that occurred.	
EventSubscription	5.6.2.4	Represents the subscription to a single event	
NotificationMethod	5.6.3.4	Represents the notification methods that can be subscribed	
Nsmf_EventExposure	5.6.2.2	Represents an Individual SMF Notification Subscription resource	
Nsmf_EventExposureNotification	5.6.2.3	Describes Notifications about events that occurred.	
SmfEvent	5.6.3.3	Represents the types of events that can be subscribed	
SubId	5.6.3.2	Identifies an Individual SMF Notification Subscription.	

Table 5.6.1-2 specifies data types re-used by the Nsmf_EventExposure service based interface protocol from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Nsmf_EventExposure service based interface.

Table 5.6.1-2: Nsmf_EventExposure re-used Data Types

Data type	Reference	Comments	Applicability
AccessType	3GPP TS 29.571 [11]		
DateTime	3GPP TS 29.571 [11]		
Dnai	3GPP TS 29.571 [11]		
DnaiChangeType	3GPP TS 29.571 [11]	Describes the types of DNAI change.	
Dnn	3GPP TS 29.571 [11]		
DurationSec	3GPP TS 29.571 [11]		
GroupId	3GPP TS 29.571 [11]		
Guami	3GPP TS 29.571 [11]	Globally Unique AMF Identifier	
Ipv4Addr	3GPP TS 29.571 [11]		
Ipv6Addr	3GPP TS 29.571 [11]		
Ipv6Prefix	3GPP TS 29.571 [11]		
PduSessionId	3GPP TS 29.571 [11]		
PlmnId	3GPP TS 29.571 [11]		
ProblemDetails	3GPP TS 29.571 [11]		
RouteToLocation	3GPP TS 29.571 [11]	A traffic route to/from an DNAI	
Supi	3GPP TS 29.571 [11]		
SupportedFeatures	3GPP TS 29.571 [11]	Used to negotiate the applicability of the optional features defined in table 5.8-1.	
Uinteger	3GPP TS 29.571 [11]		
Uri	3GPP TS 29.571 [11]		

5.6.2 Structured data types

5.6.2.1 Introduction

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

5.6.2.2 Type Nsmf_EventExposure

Table 5.6.2.2-1: Definition of type Nsmf_EventExposure

Attribute name	Data type	P	Cardinality	Description	Applicability
supi	Supi	C	0..1	Subscription Permanent Identifier (NOTE)	
dnn	Dnn	C	0..1	DNN (NOTE)	
groupId	GroupId	C	0..1	Identifies a group of UEs. (NOTE)	
pduSeId	PduSessionId	C	0..1	PDU session ID (NOTE)	
subId	SubId	C	0..1	Subscription ID. This parameter shall be supplied by the SMF in HTTP responses that include an object of Nsmf_EventExposure type.	
notifId	string	M	1	Notification Correlation ID assigned by the NF service consumer.	
notifUri	Uri	M	1	Identifies the recipient of Notifications sent by the SMF.	
altNotifIpv4Addrs	array(Ipv4Addr)	O	1..N	Alternate or backup IPv4 Addess(es) where to send Notifications.	
altNotifIpv6Addrs	array(Ipv6Addr)	O	1..N	Alternate or backup IPv6 Addess(es) where to send Notifications.	
eventSubs	array(EventSubscription)	M	1..N	Subscribed events	
guami	Guami	C	0..1	The Globally Unique AMF Identifier (GUAMI) shall be provided by an AMF as service consumer.	
serviceName	string	O	0..1	If the NF service consumer is an AMF, it should provide the name of a service produced by the AMF that makes use of the notification about subscribed events.	
supportedFeatures	SupportedFeatures	C	0..1	List of Supported features used as described in subclause 5.8. This parameter shall be supplied by NF service consumer and SMF in the POST request that request the creation of an SMF Notification Subscriptions resource and the related reply, respectively.	
NOTE: Either pduSeId, or supi, or groupId, or dnn shall be included.					

5.6.2.3 Type Nsmf_EventExposureNotification

Table 5.6.2.3-1: Definition of type Nsmf_EventExposureNotification

Attribute name	Data type	P	Cardinality	Description	Applicability
notifId	string	M	1	Notification correlation ID	
eventNotifs	array(EventNotification)	M	1..N	Notifications about Individual Events	

5.6.2.4 Type EventSubscription

Table 5.6.2.4-1: Definition of type EventSubscription

Attribute name	Data type	P	Cardinality	Description	Applicability
event	SmfEvent	M	1	Subscribed events	
notifMethod	NotificationMethod	O	0..1	If "notifMethod" is not supplied, the default value "ON_EVENT_DETECTION" applies.	
maxReportNbr	Uinteger	O	0..1	If omitted, there is no limit.	
monDur	DurationSec	O	0..1	If omitted, there is no limit.	
repPeriod	DurationSec	C	0..1	Is supplied for notification Method "periodic".	
dnaiChType	DnaiChangeType	C	0..1	For event DNAI_CH (DNAI change), whether the subscription is for early, late, or early and late DNAI change notification shall be supplied.	

5.6.2.5 Type EventNotification

Table 5.6.2.5-1: Definition of type EventNotification

Attribute name	Data type	P	Cardinality	Description	Applicability
event	SmfEvent	M	1	Event that is notified.	
timeStamp	DateTime	M	1	Time at which the event is observed.	
sourceDnai	Dnai	C	0..1	Source DN Access Identifier. Shall be included for event "DNAI_CH".	
targetDnai	Dnai	C	0..1	Target DN Access Identifier. Shall be included for event "DNAI_CH".	
dnaiChgType	DnaiChangeType	C	0..1	DNAI Change Type. Shall be included for event "DNAI_CH".	
sourceUeIpv4Addr	Ipv4Addr	O	0..1	The IPv4 Address of the served UE for the source DNAI. May be included for event "DNAI_CH".	
sourceUeIpv6Prefix	Ipv6Prefix	O	0..1	The Ipv6 Address Prefix of the served UE for the source DNAI. May be included for event "DNAI_CH".	
targetUeIpv4Addr	Ipv4Addr	O	0..1	The IPv4 Address of the served UE for the target DNAI. May be included for event "DNAI_CH" and for event "TRA_ROUT_CH".	
targetUeIpv6Prefix	Ipv6Prefix	O	0..1	The Ipv6 Address Prefix of the served UE for the target DNAI. May be included for event "DNAI_CH" and for event "TRA_ROUT_CH".	
sourceTraRouting	RouteToLocation	C	0..1	N6 traffic routing information for the source DNAI. Shall be included for event "DNAI_CH" and for event "TRA_ROUT_CH"	
targetTraRouting	RouteToLocation	C	0..1	N6 traffic routing information for the target DNAI. Shall be included for event "DNAI_CH" and for event "TRA_ROUT_CH"	
adIpv4Addr	Ipv4Addr	O	0..1	Added IPv4 Address(es). May be included for event "UE_IP_CH".	
adIpv6Prefix	Ipv6Prefix	O	0..1	Added Ipv6 Address Prefix(es). May be included for event "UE_IP_CH".	
reIpv4Addr	Ipv4Addr	O	0..1	Removed IPv4 Address(es). May be included for event "UE_IP_CH".	
reIpv6Prefix	Ipv6Prefix	O	0..1	Removed Ipv6 Address Prefix(es). May be included for event "UE_IP_CH".	
plmnId	PlmnId	C	0..1	New PLMN ID. Shall be included for event "PLMN_CH".	
accType	AccessType	C	0..1	PDU session ID. Shall be included for event "AC_TY_CH".	
pduSeId	PduSessionId	C	0..1	PDU session ID. Shall be included for event "PDU_SES_REL".	

5.6.3 Simple data types and enumerations

5.6.3.1 Introduction

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

5.6.3.2 Simple data types

The simple data types defined in table 5.6.3.2-1 shall be supported.

Table 5.6.3.2-1: Simple data types

Type Name	Type Definition	Description	Applicability
SubId	string	Identifies an Individual SMF Notification Subscription. To enable that the value is used as part of a URI, the string shall only contain characters allowed according to the "lower-with-hyphen" naming convention defined in 3GPP TS 29.501 [2]. In an OpenAPI [10] schema, the format shall be designated as "SubId".	

5.6.3.3 Enumeration: SmfEvent

Table 5.6.3.3-1: Enumeration SmfEvent

Enumeration value	Description	Applicability
AC_TY_CH	Access Type Change	
TRA_ROUT_CH	N6 traffic routing information change	
DNAI_CH	DNAI Change	
PDU_SES_REL	PDU Session Release	
PLMN_CH	PLMN Change	
UE_IP_CH	UE IP address change	

5.6.3.4 Enumeration: NotificationMethod

The enumeration NotificationMethod represents the notification methods that can be subscribed. It shall comply with the provisions defined in table 5.6.3.4-1.

Table 5.6.3.4-1: Enumeration NotificationMethod

Enumeration value	Description	Applicability
PERIODIC		
ONE_TIME		
ON_EVENT_DETECTION		

5.7 Error handling

5.7.1 General

For the Nsmf_EventExposure API, HTTP error responses shall be supported as specified in subclause 4.8 of 3GPP TS 29.501 [6]. Protocol errors and application errors specified in table 5.2.7.2-1 of 3GPP TS 29.500 [5] shall be supported for an HTTP method if the corresponding HTTP status codes are specified as mandatory for that HTTP method in table 5.2.7.1-1 of 3GPP TS 29.500 [5].

In addition, the requirements in the following subclauses are applicable for the Nsmf_EventExposure API.

5.7.2 Protocol Errors

No specific procedures for the Nsmf_EventExposure service are specified.

5.7.3 Application Errors

The application errors defined for the Nsmf_EventExposure service are listed in Table 5.7.3-1.

Table 5.7.3-1: Application errors

Application Error	HTTP status code	Description

5.8 Feature negotiation

The optional features in table 5.8-1 are defined for the Nsmf_EventExposure API. They shall be negotiated using the extensibility mechanism defined in subclause 6.6 of 3GPP TS 29.500 [4].

Table 5.8-1: Supported Features

Feature number	Feature Name	Description

Annex A (normative):
OpenAPI specification

A.1 General

The present Annex contains an OpenAPI [10] specification of HTTP messages and content bodies used by the Nsmf_EventExposure API.

In case of conflicts between the main body of the present document and the present Annex, the information in the main body shall be applicable.

A.2 Nsmf_EventExposure API

```
openapi: 3.0.0
info:
  description: Session Management Event Exposure Service API
  version: "1.PreR15.0.0"
  title: Nsmf_EventExposure
externalDocs:
  description: 3GPP TS 29.508 V0.6.0 (2018-05) 5G System; Session Management Event Exposure Service;
Stage 3
  url: http://www.3gpp.org/ftp/Specs/archive/29_series/29.508/
servers:
  - url: '{apiRoot}/Nsmf_EventExposure/v1'
    variables:
      apiRoot:
        default: https://demohost.com
        description: apiRoot as defined in subclause subclause 4.4 of 3GPP TS 29.501
paths:
  /subscriptions:
    post:
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/Nsmf_EventExposure'
      responses:
        '201':
          description: Success
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/Nsmf_EventExposure'
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '401':
          $ref: 'TS29571_CommonData.yaml#/components/responses/401'
        '411':
          $ref: 'TS29571_CommonData.yaml#/components/responses/411'
        '413':
          $ref: 'TS29571_CommonData.yaml#/components/responses/413'
        '415':
          $ref: 'TS29571_CommonData.yaml#/components/responses/415'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        '503':
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          $ref: 'TS29571_CommonData.yaml#/components/responses/default'
      callbacks:
        myNotification:
          '{$request.body#/notifUri}':
            post:
              requestBody:
                required: true
                content:
                  application/json:
                    schema:
                      $ref: '#/components/schemas/Nsmf_EventExposureNotification'
              responses:
```

```
                            '204':
                              description: No Content, Notification was succesfull
                            '307':
                              description: temporary redirect
                            '400':
                              $ref: 'TS29571_CommonData.yaml#/components/responses/400'
                            '401':
                              $ref: 'TS29571_CommonData.yaml#/components/responses/401'
                            '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'
                            '500':
                              $ref: 'TS29571_CommonData.yaml#/components/responses/500'
                            '503':
                              $ref: 'TS29571_CommonData.yaml#/components/responses/503'
                          default:
                              $ref: 'TS29571_CommonData.yaml#/components/responses/default'
  /subscriptions/{subId}:
    get:
      parameters:
        - name: subId
          in: path
          description: Event Subscription ID
          required: true
          schema:
            type: string
      responses:
        '200':
          description: OK. Resource representation is returned
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/Nsmf_EventExposure'
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '401':
          $ref: 'TS29571_CommonData.yaml#/components/responses/401'
        '414':
          $ref: 'TS29571_CommonData.yaml#/components/responses/414'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        '503':
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          $ref: 'TS29571_CommonData.yaml#/components/responses/default'
    put:
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/Nsmf_EventExposure'
      parameters:
        - name: subId
          in: path
          description: Event Subscription ID
          required: true
          schema:
            type: string
      responses:
        '200':
          description: OK. Resource was succesfully modified and representation is returned
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/Nsmf_EventExposure'
        '204':
          description: No Content. Resource was succesfully modified
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '401':
          $ref: 'TS29571_CommonData.yaml#/components/responses/401'
        '411':
```

```
              $ref: 'TS29571_CommonData.yaml#/components/responses/411'
            '413':
              $ref: 'TS29571_CommonData.yaml#/components/responses/413'
            '415':
              $ref: 'TS29571_CommonData.yaml#/components/responses/415'
            '500':
              $ref: 'TS29571_CommonData.yaml#/components/responses/500'
            '503':
              $ref: 'TS29571_CommonData.yaml#/components/responses/503'
            default:
              $ref: 'TS29571_CommonData.yaml#/components/responses/default'
      delete:
        parameters:
          - name: subId
            in: path
            description: Event Subscription ID
            required: true
            schema:
              type: string
        responses:
          '204':
            description: No Content. Resource was succesfully deleted
          '400':
            $ref: 'TS29571_CommonData.yaml#/components/responses/400'
          '401':
            $ref: 'TS29571_CommonData.yaml#/components/responses/401'
          '500':
            $ref: 'TS29571_CommonData.yaml#/components/responses/500'
          '503':
            $ref: 'TS29571_CommonData.yaml#/components/responses/503'
          default:
            $ref: 'TS29571_CommonData.yaml#/components/responses/default'
components:
  schemas:
    Nsmf_EventExposure:
      type: object
      properties:
        supi:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
        dnn:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
        groupId:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/GroupId'
        pduSeId:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/PduSessionId'
        subId:
          $ref: '#/components/schemas/SubId'
        notifId:
          type: string
          description: Notification Correlation ID assigned by the NF service consumer.
        notifUri:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
        altNotifIpv4Addrs:
          type: array
          items:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
          description: Alternate or backup IPv4 Addess(es) where to send Notifications.
          minItems: 1
        altNotifIpv6Addrs:
          type: array
          items:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Addr'
          description: Alternate or backup IPv6 Addess(es) where to send Notifications.
          minItems: 1
        eventSubs:
          type: array
          items:
            $ref: '#/components/schemas/EventSubscription'
          minItems: 1
          description: Subscribed events
        guami:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Guami'
        serviveName:
          type: string
          description: If the NF service consumer is an AMF, it should provide the name of a service
produced by the AMF that makes use of notifications about subscribed events.
        supportedFeatures:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
```

```
          required:
            - notifId
            - notifUri
            - eventSubs
    Nsmf_EventExposureNotification:
      type: object
      properties:
        notifId:
          type: string
          description: Notification correlation ID
        eventNotifs:
          type: array
          items:
            $ref: '#/components/schemas/EventNotification'
          minItems: 1
          description: Notifications about Individual Events
      required:
        - notifId
        - eventNotifs
    EventSubscription:
      type: object
      properties:
        event:
          $ref: '#/components/schemas/SmfEvent'
        notifMethod:
          $ref: '#/components/schemas/NotificationMethod'
        maxReportNbr:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Uinteger'
        monDur:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/DurationSec'
        repPeriod:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/DurationSec'
        dnaiChgType:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/DnaiChangeType'
      required:
        - event
    EventNotification:
      type: object
      properties:
        event:
          $ref: '#/components/schemas/SmfEvent'
        timeStamp:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
        sourceDnai:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnai'
        targetDnai:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnai'
        dnaiChgType:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/DnaiChangeType'
        sourceUeIpv4Addr:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
        sourceUeIpv6Prefix:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Prefix'
        targetUeIpv4Addr:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
        targetUeIpv6Prefix:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Prefix'
        sourceTraRouting:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/RouteToLocation'
        targetTraRouting:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/RouteToLocation'
        adIpv4Addr:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
        adIpv6Prefix:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Prefix'
        reIpv4Addr:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
        reIpv6Prefix:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Prefix'
        plmnId:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
        accType:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/AccessType'
        pduSeId:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/PduSessionId'
      required:
        - event
        - timeStamp
```

```
    SubId:
      type: string
      format: SubId
      description: Identifies an Individual SMF Notification Subscription. To enable that the value
is used as part of a URI, the string shall only contain characters allowed according to the "lower-
with-hyphen" naming convention defined in 3GPP TS 29.501 [2]. In an OpenAPI [10] schema, the format
shall be designated as "SubId".
    SmfEvent:
      anyOf:
      - type: string
        enum:
          - AC_TY_CH
          - TRA_ROUT_CH
          - DNAI_CH
          - PDU_SES_REL
          - PLMN_CH
          - UE_IP_CH
      - 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: >
        Possible values are
        - AC_TY_CH: Access Type Change
        - TRA_ROUT_CH: N6 traffic routing information change
        - DNAI_CH: DNAI Change
        - PDU_SES_REL: PDU Session Release
        - PLMN_CH: PLMN Change
        - UE_IP_CH: UE IP address change
    NotificationMethod:
      anyOf:
      - type: string
        enum:
          - PERIODIC
          - ONE_TIME
          - ON_EVENT_DETECTION
      - 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: >
        Possible values are
        - PERIODIC
        - ONE_TIME
        - ON_EVENT_DETECTION
```

Annex B (informative):
Change history

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Cat	Subject/Comment	New
2017-10						TS skeleton of Session Management Event Exposure Service specification	0.0.0
2017-10	CT3#92					C3-175326,C3-175327 and C3-175281	0.1.0
2017-12	CT3#93					C3-176071, C3-176240, C3-176316, C3-176242, C3-176243, C3-176244, C3-176317 and C3-176318	0.2.0
2018-01	CT3#94					C3-180034, C3-180196 and C3-180197	0.3.0
2018-03	CT3#95	C3-181366				Inclusion of P-CRs agreed in CT3#95: C3-181214, C3-181215, C3-181216, C3-181217, C3-181354, C3-181353.	0.4.0
2018-04	CT3#96					C3-182315, C3-182316, C3-182144, C3-182317	0.5.0
2018-05	CT3#97					C3-183452, C3-183451, C3-183829, C3-183453, C3-183454, C3-183283 and C3-183455.	0.6.0
2018-06	CT#80	CP-181039				TS sent to plenary for approval	1.0.0
2018-06	CT#80	CP-181039				TS approved by plenary	15.0.0
2018-09	CT#81	CP-182015	0001	2	F	DNAI change notification type	15.1.0
2018-09	CT#81	CP-182015	0002	4	F	Completion of Error Codes in OpenAPI file	15.1.0
2018-09	CT#81	CP-182015	0003	-	F	Definition of DNAI	15.1.0
2018-09	CT#81	CP-182015	0004	2	F	Stateless AMF support updates	15.1.0
2018-09	CT#81	CP-182015	0007	1	F	Encoding of the "N6 traffic routing information"	15.1.0
2018-09	CT#81	CP-182033	0008	2	F	Addition of Time Stamp	15.1.0
2018-09	CT#81	CP-182015	0009	1	F	Update of resource figure	15.1.0
2018-09	CT#81	CP-182015	0010	-	F	Update of resource figure	15.1.0

History

Document history		
V15.0.0	June 2018	Publication
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