**3GPP TSG- Meeting #s3i240061**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  |  | **CR** |  | **Rev** | **2** | **Current version:** |  |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

|  |
| --- |
|  |
| ***Title:***  | PoI in NWDAF Stage 3 |
|  |  |
| ***Source to WG:*** | SA3LI (Ministère Economie et Finances) |
| ***Source to TSG:*** | SA3 |
|  |  |
| ***Work item code:*** |  |  | ***Date:*** |  |
|  |  |  |  |  |
| ***Category:*** |  |  | ***Release:*** |  |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
|  |  |
| ***Reason for change:*** | Enable the LEA to get analytics data related to a target UE in the form of statistics and/or predictions. |
|  |  |
| ***Summary of change:*** | Provide analytics data related to a target UE. |
|  |  |
| ***Consequences if not approved:*** | The above information will still be missing. |
|  |  |
| ***Clauses affected:*** | 2; 7.X;  |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** | Schema changes for this CR can be found on the Forge:Merge Request: <https://forge.3gpp.org/rep/sa3/li/-/merge_requests/243>Commit Hash: <https://forge.3gpp.org/rep/sa3/li/-/commit/3688781eb3416c10417fdb2f5ff892cd5a8d6e3b> |
|  |  |
| ***This CR's revision history:*** | s3i240021; s3i240048 |

**\*\*\* Start of First Change \*\*\***

# 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".

[3] 3GPP TS 33.126: "Lawful Interception Requirements".

[4] 3GPP TS 23.502: "Procedures for the 5G System; Stage 2".

[5] 3GPP TS 33.127: "Lawful Interception (LI) Architecture and Functions".

[6] ETSI TS 103 120: "Lawful Interception (LI); Interface for warrant information".

[7] ETSI TS 103 221-1: "Lawful Interception (LI); Internal Network Interfaces; Part 1: X1".

[8] ETSI TS 103 221-2: "Lawful Interception (LI); Internal Network Interfaces; Part 2: X2/X3".

 [9] ETSI TS 102 232-1: "Lawful Interception (LI); Handover Interface and Service-Specific Details (SSD) for IP delivery; Part 1: Handover specification for IP delivery".

[10] ETSI TS 102 232-7: "Lawful Interception (LI); Handover Interface and Service-Specific Details (SSD) for IP delivery; Part 7: Service-specific details for Mobile Services".

[11] 3GPP TS 33.501: "Security Architecture and Procedures for the 5G System".

[12] 3GPP TS 33.108: "3G security; Handover interface for Lawful Interception (LI)".

[13] 3GPP TS 24.501: "Non-Access-Stratum (NAS) protocol for 5G System (5GS)".

[14] 3GPP TS 24.007: "Mobile radio interface signalling layer 3; General Aspects".

[15] 3GPP TS 29.244: "Interface between the Control Plane and the User Plane nodes".

[16] 3GPP TS 29.502: "5G System; Session Management Services; Stage 3".

[17] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".

[18] 3GPP TS 23.040: "Technical realization of the Short Message Service (SMS)".

[19] 3GPP TS 23.003: "Numbering, addressing and identification ".

[20] OMA-TS-MLP-V3\_5-20181211-C: "Open Mobile Alliance; Mobile Location Protocol, Candidate Version 3.5", <https://www.openmobilealliance.org/release/MLS/V1_4-20181211-C/OMA-TS-MLP-V3_5-20181211-C.pdf>.

[21] 3GPP TS 29.540: "5G System; SMS Services; Stage 3".

[22] 3GPP TS 29.518: "5G System; Access and Mobility Management Services; Stage 3".

[23] 3GPP TS 38.413: "NG Application Protocol (NGAP)".

[24] 3GPP TS 29.572: "Location Management Services; Stage 3".

[25] 3GPP TS 29.503: "5G System; Unified Data Management Services".

[26] IETF RFC 815: "IP datagram reassembly algorithms".

[27] IETF RFC 2460: "Internet Protocol, Version 6 (IPv6) Specification".

[28] IETF RFC 793: "Transmission Control Protocol".

[29] IETF RFC 768: "User Datagram Protocol".

[30] IETF RFC 4340: "Datagram Congestion Control Protocol (DCCP)".

[31] IETF RFC 4960: "Stream Control Transmission Protocol".

[32] IANA (www.iana.org): Assigned Internet Protocol Numbers, "Protocol Numbers".

[33] IETF RFC 6437: "IPv6 Flow Label Specification".

[34] IETF RFC 791: "Internet Protocol".

[35] Open Geospatial Consortium OGC 05-010: "URNs of definitions in ogc namespace".

[36] 3GPP TS 33.107: "3G security; Lawful interception architecture and functions".

[37] 3GPP TS 37.340: "Evolved Universal Radio Access (E-UTRA) and NR-Multi-connectivity; Stage 2".

[38] 3GPP TS 36.413: "S1 Application Protocol (S1AP)".

[39] OMA-TS-MMS\_ENC-V1\_3-20110913-A: "Multimedia Messaging Service Encapsulation Protocol".

[40] 3GPP TS 23.140: "Multimedia Messaging Protocol. Functional Description. Stage 2".

[41] 3GPP TS 38.415: "NG-RAN; PDU Session User Plane Protocol".

[42] 3GPP TS 23.273: "5G System (5GS) Location Services (LCS); Stage 2".

[43] IETF RFC 4566: "SDP: Session Description Protocol".

[44] 3GPP TS 24.193: "Stage 3: Access Traffic Steering, Switching and Splitting (ATSSS)".

[45] 3GPP TS 29.509: "5G System; Authentication Server Services; Stage 3".

[46] 3GPP TS 24.011: "Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface".

[47] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[48] 3GPP TS 29.504: "5G System; Unified Data Repository Services; Stage 3".

[49] 3GPP TS 29.505: "5G System; Usage of the Unified Data Repository services for Subscription Data; Stage 3".

[50] 3GPP TS 23.401 "General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access".

[51] 3GPP TS 24.301 "Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS), Stage 3".

[52] 3GPP TS 23.271 "Functional stage 2 description of Location Services (LCS)".

[53] 3GPP TS 29.172 "Evolved Packet Core (EPC) LCS Protocol (ELP) between the Gateway Mobile Location Centre (GMLC) and the Mobile Management Entity (MME); SLg interface".

[54] 3GPP TS 29.171 "LCS Application Protocol (LCS-AP) between the Mobile Management Entity (MME) and Evolved Serving Mobile Location Centre (E-SMLC); SLs interface".

[55] 3GPP TS 24.379: "Mission Critical Push to Talk (MCPTT) call control; protocol specification".

[56] OMA-TS-PoC-System\_Description-V2\_1-20110802-A: "OMA PoC System Description".

[57] 3GPP TS 29.541: "5G System; Network Exposure (NE) function services for Non-IP Data Delivery (NIDD); Stage 3".

[58] 3GPP TS 29.522: "5G System; Network Exposure Function Northbound APIs; Stage 3".

[59] 3GPP TS 29.338: "Diameter based protocols to support Short Message Service (SMS) capable Mobile Management Entities (MMEs); Stage 3".

[60] 3GPP TS 29.337: "Diameter-based T4 interface for communications with packet data networks and applications".

[61] 3GPP TS 24.250: "Protocol for Reliable Data Service; Stage 3".

[62] 3GPP TS 29.128: "Mobility Management Entity (MME) and Serving GPRS Support Node (SGSN) interfaces for interworking with packet data networks and applications".

[63] 3GPP TS 29.122: "T8 reference point for Northbound APIs".

[64] 3GPP TS 29.598: "5G System; Unstructured Data Storage Services; Stage3".

[65] 3GPP TS 33.535: "Authentication and Key Management for Applications (AKMA) based on 3GPP credentials in the 5G System (5GS)".

[66] IETF RFC 5246: "The Transport Layer Security (TLS) Protocol Version 1.2".

[67] GSMA IR.88: "IR.88 LTE and EPC Roaming Guidelines".

[68] GSMA NG.114 "IMS Profile for Voice, Video and Messaging over 5GS".

[69] IETF RFC 8225: "PASSporT: Personal Assertion Token".

[70] IETF RFC 8224: "Authenticated Identity Management in the Session Initiation Protocol (SIP)".

[71] IETF RFC 8588: "Personal Assertion Token (PaSSporT) Extension for Signature-based Handling of Asserted information using toKENs (SHAKEN)".

[72] 3GPP TS 24.196: "Enhanced Calling Name (eCNAM)".

[73] IETF draft-ietf-stir-passport-rcd-17: "PASSporT Extension for Rich Call Data".

NOTE: The above document cannot be formally referenced until it is published as an RFC.

[74] 3GPP TS 24.229: "IP multimedia call control protocol based on Session Initiation Protocol (SIP)and Session Description Protocol (SDP); Stage 3".

[75] IANA Session Initiation Protocol (SIP) Parameters: <https://www.iana.org/assignments/sip-parameters/sip-parameters.xhtml>

[76] IETF RFC 8946: "Personal Assertion Token (PASSporT) Extension for Diverted Calls".

[77] 3GPP TS 23.204: "3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Support of Short Message Service (SMS) over generic 3GPP Internet Protocol (IP) access; Stage 2".

[78] GSMA RCC.07: "Rich Communication Suite – Advanced Communications Services and Client Specification".

[79] IETF RFC 4975: "The Message Session Relay Protocol (MSRP)".

[80] IETF RFC 3862: "Common Presence and Instant Messaging (CPIM): Message Format".

[81] IETF RFC 5438: "Instant Message Disposition Notification (IMDN)".

[82] OMA-TS-CPM\_System\_Description-V2\_2-20170926-C: "OMA Converged IP Messaging System Description".

[83] Void.

[84] 3GPP TS 36.455: "Evolved Universal Terrestrial Radio Access (E-UTRA); LTE Positioning Protocol A (LPPa) ".

[85] 3GPP TS 37.355: "LTE Positioning Protocol (LPP)".

[86] 3GPP TS 38.455: "NG-RAN; NR Positioning Protocol A (NRPPa)".

[87] 3GPP TS 29.274: "3GPP Evolved Packet System (EPS); Evolved General Packet Radio Service (GPRS) Tunnelling Protocol for Control plane (GTPv2-C); Stage 3".

[88] 3GPP TS 29.513: "5G System; Policy and Charging Control signalling flows and QoS parameter mapping".

[89] 3GPP TS 29.512: "5G System; Session Management Policy Control Service; Stage 3".

[90] 3GPP TS 29.508: "5G System; Session Management Event Exposure Service; Stage 3".

[91] 3GPP TS 29.514: "5G System; Policy Authorization Service; Stage 3".

[92] 3GPP TS 29.214: "Policy and Charging Control over Rx reference point".

[93] 3GPP TS 24.558: "Enabling Edge Applications; Protocol specification".

[94] 3GPP TS 29.558: "Enabling Edge Applications; Application Programming Interface (API) specification".

[95] 3GPP TS 24.008: "Mobile radio interface Layer 3 specification; Core network protocols; Stage 3".

[96] 3GPP TS 29.551: "5G System; Packet Flow Description Management Service; Stage 3".

[97] ETSI TS 103 280: "Lawful Interception (LI); Dictionary for common parameters".

[98] 3GPP TS 26.512: "5G Media Streaming (5GMS); Protocols".

[99] 3GPP TS 26.247: "Transparent end-to-end Packet-switched Streaming Service (PSS); Progressive Download and Dynamic Adaptive Streaming over HTTP (3GP-DASH)".

[100] 3GPP TS 29.563: "5G System; Home Subscriber Server (HSS) services for interworking with Unified Data Management (UDM); Stage 3".

[101] 3GPP TS 29.562: "5G System; Home Subscriber Server (HSS) Services; Stage 3".

[102] 3GPP TS 24.341 "Support of SMS over IP networks, Stage 3".

[103] 3GPP TS 38.473 "NG-RAN;F1 application protocol (F1AP)".

[104] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)".

[105] ITU-T Recommendation Q.763 (1999): "Specifications of Signalling System No.7; Formats and codes".

[106] 3GPP TS 29.272: "Mobility Management Entity (MME) and Serving GPRS Support Node (SGSN) related interfaces based on Diameter protocol".

[107] IETF RFC 6442: "Location Conveyance for the Session Initiation Protocol".

[108] Void.

[109] OMA-TS-CPM\_Conv\_Function: "OMA CPM Conversation Functions".

[110] IETF RFC 2045: "Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies".

[111] 3GPP TS 32.299: " Telecommunication management; Charging management; Diameter charging applications".

[112] 3GPP TS 32.423: "Telecommunication management; Subscriber and equipment trace; Trace data definition and management".

[113] 3GPP TS 38.414: "NG-RAN; NG data transport".

[114] IETF RFC 2045: "Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies".

[115] IETF RFC 5322: "Internet Message Format".

[116] IETF RFC 4975: "The Message Session Relay Protocol (MSRP)".

[117] IETF RFC 6901: "JavaScript Object Notation (JSON) Pointer".

[118] IETF RFC 3261: "SIP: Session Initiation Protocol".

[119] W3C Recommendation: "XML Path Language (XPath)".

[120] IETF RFC 2046: "Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types".

[121] 3GPP TR 33.928: "ADMF Logic for Provisioning Lawful Interception (LI) ".

[122] 3GPP TS 23.316: "Wireless and wireline convergence access support for the 5G System".

[123] 3GPP TS 23.038: "Alphabets and language-specific information".

[124] ITU-T Recommendation X.680 (2021): "Information technology—Abstract Syntax Notation One (ASN.1): Specification of basic notation".

[125] IETF RFC 4282: "The Network Access Identifier".

[126] IETF RFC 7042: "IANA Considerations and IETF Protocol and Documentation Usage for IEEE 802 Parameters".

[127] IEEE "Guidelines for Use of Extended Unique Identifier (EUI), Organizationally Unique Identifier (OUI), and Company ID (CID)", <https://standards.ieee.org/content/dam/ieee-standards/standards/web/documents/tutorials/eui.pdf>

[128] 3GPP TS 24.502: "Access to the 3GPP 5G Core Network (5GCN) via Non-3GPP Access Networks (N3AN)".

[129] 3GPP TS 29.520: "Network Data Analytics Services".

**\*\*\* End of First Change \*\*\***

**\*\*\* Start of Second Change \*\*\***

7.X LI at NWDAF

7.X.1 Provisioning over LI\_X1

7.X.1.1 Provisioning of IRI-POI in NWDAF

The IRI-POI present in the NWDAF is provisioned over LI\_X1 by the LIPF using the X1 protocol as described in clause 5.2.2.

The POI in the NWDAF shall support the target identifier types given in table 7.X.1.1-1.

**Table 7.X.1.1-1: TargetIdentifier types for data analytics**

|  |  |  |  |
| --- | --- | --- | --- |
| **Identifier** | **Owner** | **ETSI TS 103 221-1 [7] TargetIdentifier type** | **Definition** |
| SUPIIMSI | ETSI | SUPIIMSI | See ETSI TS 103 221-1 [7] |
| SUPINAI | ETSI | SUPINAI | See ETSI TS 103 221-1 [7] |

Table 7.X.1.1-2 shows the minimum details of the LI\_X1 ActivateTask message used for provisioning the IRI-POI in the NWDAF.

If the IRI-POI in the NWDAF receives an ActivateTask message and the ListOfServiceTypes parameter contains a ServiceType that is not supported, the IRI-POI in the NWDAF shall reject the task with an appropriate error as described in ETSI TS 103 221-1 [7] clause 6.2.1.2.

**Table 7.X.1.1-2: ActivateTask message for the IRI-POI in the NWDAF**

|  |  |  |
| --- | --- | --- |
| **ETSI TS 103 221-1 [7] field name** | **Description** | **M/C/O** |
| XID | XID assigned by LIPF. | M |
| TargetIdentifiers | One of the target identifiers listed in the paragraph above. | M |
| DeliveryType | Set to “X2Only”. | M |
| ListOfDIDs | Delivery endpoints for LI\_X2 for the IRI-POI in the NWDAF. These delivery endpoints are configured using the CreateDestination message as described in ETSI TS 103 221-1 [7] clause 6.3.1 prior to the task activation. | M |
| ListOfServiceTypes | Shall be included when the explicit identification of specific CSP service types to be intercepted by the task as described in clause 5.2.4 is required. This parameter is defined in ETSI TS 103 221-1 [7], clause 6.2.1.2, table 4. | M |

7.X.1.2 Provisioning of the MDF2

The MDF2 listed as the delivery endpoint over LI\_X2 for xIRI generated by NWDAF shall be provisioned over LI\_X1 by the LIPF.

The target identities listed in clause 7.X.1.1 shall apply for the provisioning of MDF2.

Table 7.X.1.2-1 shows the minimum details of the LI\_X1 ActivateTask message used for provisioning the MDF2.

**Table 7.X.1.2-1 ActivateTask message for MDF2**

|  |  |  |
| --- | --- | --- |
| **ETSI TS 103 221-1 [7] field name** | **Description** | **M/C/O** |
| XID | XID assigned by LIPF. | M |
| TargetIdentifiers | One or more of the target identifiers listed in clause 7.X.1.1. | M |
| DeliveryType | Set to “X2Only”. (Ignored by the MDF2). | M |
| ListOfDIDs | Delivery endpoints of LI\_HI2. These delivery endpoints shall be configured using the *CreateDestination* message as described in ETSI TS 103 221-1 [7] clause 6.3.1 prior to first use. | M |
| ListOfMediationDetails | Sequence of Mediation Details, See table 7.X.1.2-2 | M |

**Table 7.X.1.2-2: Mediation Details for MDF2**

|  |  |  |
| --- | --- | --- |
| **ETSI TS 103 221-1 [7] field name** | **Description** | **M/C/O** |
| LIID | Lawful Interception ID associated with the task. | M |
| DeliveryType | Set to “HI2Only”. | M |
| ListOfDIDs | Details of where to send the IRI for this LIID. Shall be included if deviation from the ListofDIDs in the ActivateTask message is necessary. If included, the ListOfDIDs in the Mediation Details shall be used instead of any delivery destinations authorised by the ListOfDIDs field in the ActivateTask Message. | C |
| ServiceScoping | Service type set to “Data”. Other fields are dependent on the warrant. | M |

7.X.2 Generation of xIRI over LI\_X2

7.X.2.1 General

The IRI-POI present in the NWDAF shall send the xIRIs over LI\_X2 for each of the events listed in TS 33.127 [5] clause 7.X.4, the details of which are described in the following clauses.

7.X.2.2 Events subscription

The IRI-POI in the NWDAF shall generate an xIRI containing an NWDAFEventSubscription record when the IRI-POI present in the NWDAF detects that an NF consumer has subscribed, updated a subscription or deleted a subscription for UE related analytics events for a target UE.

Accordingly, the IRI-POI in the NWDAF generates the xIRI when any of the following events is detected (see TS 29.520 [129] clause 4.2.2.1):

- NWDAF returns a Nwdaf\_EventsSubscription\_Subscribe Response in response to Nwdaf\_EventsSubscription\_Subscribe Request received from an authorized NF consumer to subscribe to UE related analytics events for a target UE.

- NWDAF returns a Nwdaf\_EventsSubscription\_Subscribe Response in response to Nwdaf\_EventsSubscription\_Subscribe Request received from an NF consumer to update a subscription to UE related analytics events for a target UE.

- NWDAF returns a Nwdaf\_ EventsSubscription\_Unsubscribe Response in response to Nwdaf\_EventsSubscription\_Unsubscribe Request received from an NF consumer to unsubscribe from UE related analytics event notifications for a target UE.

**Table 7.X.2.2-1: Payload for NWDAFEventsSubscription record**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Cardinality** | **Description** | **M/C/O** |
| sUPI | SUPI | 1 | Identifies the SUPI of the target UE. | M |
| nWDAFConsumerNFType | NWDAFConsumerNFType | 1 | Identifies the type of NF consumer.  | M |
| nWDAFEventsSubscriptionOpType | NWDAFEventsSubscriptionOperation | 1 | Identifies the type of Nnwdaf\_EventsSubscription service operation, i.e., POST to create a subscription, PUT to update a subscription, DELETE to delete a subscription.  | M |
| nWDAFSubscribedEventList | SET OF NWDAFEvent | 1..MAX | Identifies the list of analytics events the NF consumer subscribes to.  | C |
| nWDAFEventsSubscription | SBIType | 0..1 | Includes the NnwdafEventsSubscription resource which contains a set of events and their configuration data the NF consumer subscribes to. Encoded according to TS 29.520 [129] clause 5.1.6.2.3. The SBIReference for this parameter shall be populated with 'TS29520\_Nnwdaf\_EventsSubscription.yaml#/components/schemas/NnwdafEventsSubscription' as specified in TS 29.520 [129] clause A2. | C |
| nWDAFEventsSubscriptionID | UTF8String | 0..1 | Identifies the subscription. It is present in the Location header of the 201 Created response when the subscription is created using the POST method as defined in TS 29.520 [129], clause 5.1.3.2.3, table 5.1.3.2.3.1-4. It represents the resource URI of both the PUT method for subscription update and DELETE method for subscription deletion. | C |
| nWDAFEvent SubscriptionResponseCode | NWDAFEventSubscriptionResponseCode | 1 | Identifies the response code associated with the Nwdaf\_EventsSubscription service operation executed by the NWDAF. | M |

7.X.2.3 Events notification

The IRI-POI in the NWDAF shall generate an xIRI containing an NWDAFEventsNotification record when the IRI-POI present in the NWDAF detects that the NWDAF has notified an NF consumer about UE related analytics events for a target UE.

Accordingly, the IRI-POI in the NWDAF generates the xIRI when any of the following events is detected (see TS 29.520 [129] clause 4.2.2.1):

- NWDAF sends a Nnwdaf\_EventsSubscription\_Notify Request to notify a NF consumer about subscribed UE related analytics events for a target UE.

**Table 7.X.2.3-1: Payload for NWDAFEventsNotification record**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Cardinality** | **Description** | **M/C/O** |
| sUPI | SUPI | 1 | Identifies the SUPI of the target UE. | M |
| nWDAFNotifiedEventList | SET OF NWDAFEvent | 1..MAX | Identifies the analytics events notified to the NF consumer. | M |
| nWDAFEventsNotification | SBIType | 1 | Includes a NwdafEventsSubscriptionNotification resource which provides information about the observed events. The NwdafEventsSubscriptionNotification is encoded according to TS 29.520 [129] clause 5.1.6.2.4. The SBIReference for this parameter shall be populated with 'TS29520\_Nnwdaf\_EventsSubscription.yaml#/components/schemas/NnwdafEventsSubscriptionNotification' as specified in TS 29.520 [129] clause A2.The NwdafEventsSubscriptionNotification resource includes the SubscriptionId which enables correlating the events subscription and events notification.  | M |

7.X.2.4 Analytics info query

The IRI-POI in the NWDAF shall generate an xIRI containing an NWDAFAnalyticsInfoQuery record when the IRI-POI present in the NWDAF detects that an authorized NF consumer queries a UE-related analytics for a target UE.

Accordingly, the IRI-POI in the NWDAF generates the xIRI when any of the following events is detected (see TS 29.520 [129] clause 4.3.2.1):

- NWDAF returns a Nwdaf\_AnalyticsInfo\_Request Response in response to Nwdaf\_AnalyticsInfo\_Request Request received from an authorized NF consumer to get analytics data for a UE related analytics event for a target UE.

**Table 7.X.2.4-1: Payload for NWDAFAnalyticsInfoQuery record**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Cardinality** | **Description** | **M/C/O** |
| sUPI | SUPI | 1 | Identifies the SUPI of the target UE. | M |
| nWDAFEvent | NWDAFEvent | 1 | Identifies the analytics event being requested. | M |
| nWDAFEventReportingRequirement | SBIType | 0..1 | Includes an EventReportingRequirement resource associated to the requested event to identify the type of reporting required. The EventReportingRequirement is encoded according to TS 29.520[129] clause 5.1.6.2.7. The SBIReference for this parameter shall be populated with 'TS29520\_Nnwdaf\_AnalyticsInfo.yaml#/components/schemas/EventReportingRequirement' as specified in TS 29.520 [129] clause A3. | C |
| nWDAFEventFilter | SBIType | 0..1 | Includes an EventFilter resource associated to the requested event to identify the requested analytics. The EventFilter is encoded according to TS 29.520 [129] clause 5.2.6.2.3. The SBIReference for this parameter shall be populated with 'TS29520\_Nnwdaf\_AnalyticsInfo.yaml#/components/schemas/EventFilter' as specified in TS 29.520 [129] clause A3. | C |
| nWDAFAnalyticsData | NWDAFAnalyticsInfoResponse | 1 | Includes an AnalyticData resource present in the response when the response code is 200 OK. The AnalyticsData is encoded according to TS 29.520 [129] clause 5.1.6.2.13. The SBIReference for the UeCommunication parameter shall be populated with 'TS29520\_Nnwdaf\_AnalyticsInfo.yaml#/components/schemas/AnalyticsData' as specified in TS 29.520 [129] clause A3. | C |
| nWDAFAnalyticsInfoResponseCode | NWDAFAnalyticsInfoResponseCode | 1 | Identifies the response code associated with the Nwdaf\_AnalyticsInfo\_Request service operation (i.e., GET) executed by the NWDAF. | M |

7.X.2.5 Roaming scenarios

7.X,2.5.1 General

In the roaming scenario, the NWDAF in the visited network that receives a request from the NF consumer (of visited network) may pass the query to the NWDAF in the home network and vice versa. As described in TS 33.127 [x], the NWDAF is V-RE-NWDAF (when it is in the visited network) or a H-RE-NW-DAF when it is the home network.

The IRI-POI functions described in this clause applies to the V-RE-NWDAF or H-RE-NWDAF depending on which of the twe receives the query from the other NWDAF. The NWDAF that provides the IRI-POI functions is referred to as RE-NWDAF in the following two sub-clauses..

7.X,2.5.2 Roaming analytics subscription

The IRI-POI in the RE-NWDAF shall generate an xIRI containing an NWDAFRoamingAnalyticsSubscription record when the IRI-POI present in the RE-NWDAF detects that an NWDAF consumer has subscribed, updated a subscription or deleted a subscription for UE related analytics events for a target inbound or outbound roaming UE.

Accordingly, the IRI-POI in the RE-NWDAF generates the xIRI when any of the following events is detected (see TS 29.520 [129] clause 4.9.2.1):

- RE-NWDAF returns a Nwda\_RoamingAnalytics\_Subscribe Response in response to Nwdaf\_RoamingAnalytics\_Subscribe Request received from a NWDAF consumer to subscribe to UE related analytics events for a target UE.

- RE-NWDAF returns a Nwdaf\_RoamingAnalytics\_Subscribe Response in response to Nwdaf\_RoamingAnalytics\_Subscribe Request received from a NWDAF consumer to update a subscription to UE related analytics events for a target UE.

- RE-NWDAF returns a Nwdaf\_ RoamingAnalytics\_Unsubscribe Response in response to Nwdaf\_RoamingAnalytics\_Unsubscribe Request received from a NWDAF consumer to unsubscribe from UE related analytics events notifications for a target UE.

**Table 7.X.2.5-1: Payload for NWDAFRoamingAnalyticsSubscription record**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Cardinality** | **Description** | **M/C/O** |
| sUPI | SUPI | 1 | Identifies the SUPI of the target UE. | M |
| pLMNID | PLMNID | 1 | Identifies the PLMN ID of the consumer NWDAF. | M |
| nWDAFEventsSubscriptionOpType | NWDAFEventsSubscriptionOperation | 1 | Identifies the type of Nnwdaf\_EventsSubscription service operation, i.e., POST to create a sbscription, PUT to update a subscription, DELETE to delete a subscription.  | M |
| nWDAFSubscribedEventList | SET OF NWDAFEvent | 1..MAX | Identifies the list of events the NWDAF consumer subscribes to. | C |
| nWDAFEventsSubscription | SBIType | 0..1 | Includes the NnwdafRoamingAnalyticsSubscription resource which contains a set of events and their configuration data the NWDAF consumer subscribes to. Encoded according to TS 29.520 [129] clause 5.8.6.2.2. The SBIReference for this parameter shall be populated with 'TS29520\_Nnwdaf\_EventsSubscription.yaml#/components/schemas/RoamingAnalyticsSubscription' as specified in TS 29.520 [129] clause A9. | C |
| nWDAFEventsSubscriptionID | UTF8String | 0..1 | Identifies the subscription. It is present in the Location header of the 201 Created response when the subscription is created using the POST method as defined in TS 29.520 [129], clause 5.8.3.2.3, table 5.8.3.2.3.1-4. It represents the resource URI of both the PUT method for subscription update and DELETE method for subscription deletion. | C |
| nWDAFEvents SubscriptionResponseCode | NWDAFEventsSubscriptionResponseCode | 1 | Identifies the response code associated with the NwdafRoamingAnalytics service operation executed by the NWDAF. | M |

7.x,2.5.3 Roaming analytics notification

The IRI-POI in the RE-NWDAF shall generate an xIRI containing an NWDAFRoamingAnalyticsNotification record when the IRI-POI present in the RE-NWDAF detects that the RE-NWDAF has notified a NWDAF consumer about UE related analytics events for a target inbound or outbound roaming UE.

Accordingly, the IRI-POI in the RE-NWDAF generates the xIRI when any of the following events is detected (see TS 29.520 [129] clause 4.9.2.1):

- NWDAF sends a Nnwdaf\_AnalyticsInfo\_Notify Request to notify a NF consumer about subscribed UE related analytics events for a target UE.

**Table 7.X.2.6-1: Payload for NWDAFRoamingAnalyticsNotification record**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Cardinality** | **Description** | **M/C/O** |
| sUPI | SUPI | 1 | Identifies the SUPI of the target UE. | M |
| nWDAFNotifiedEventList | SET OF NWDAFEvent | 1..MAX | Identifies the analytics events notified to the NF consumer.  | M |
| nWDAFEventsNotification | SBIType | 1 | Includes a NwdafRoamingAnalyticsNotification resource which provides information about the observed events. The NwdafRoamingAnalyticsNotification is encoded according to TS 29.520 [129] clause 5.8.6.2.3. The SBIReference for the NwdafRoamingAnalyticsNotification parameter shall be populated with 'TS29520\_Nnwdaf\_RoamingAnalytics.yaml#/components/schemas/RoamingAnalyticsNotification' as specified in TS 29.520 [129] clause A9. | M |

7.X.3 Generation of IRI over LI\_HI2

When an xIRI is received over LI\_X2 from the IRI-POI in the NWDAF/RE-NWDAF, the MDF2 shall send the IRI message over LI\_HI2 without undue delay. The IRI message shall contain a copy of the relevant record received from LI\_X2. The record may be enriched by other information available at the MDF (e.g. additional location information).

The timestamp field of the ETSI TS 102 232-1 [9] PSHeader structure shall be set to the time at which the NWDAF/RE-NWDAF event was observed (i.e. the timestamp field of the xIRI).

The IRI type parameter shall be included and coded according to table 7.14.2-19 (see ETSI TS 102 232-1 [9] clause 5.2.10).

**Table 7.15.3-1: IRI type for IRI messages**

|  |  |
| --- | --- |
| **Record type** | **IRI Type** |
| NWDAFEventsSubscription | REPORT |
| NWDAFEventsNotification | REPORT |
| NWDAFAnalyticsInfoQuery | REPORT |
| NWDAFRoamingAnalyticsSubscription | REPORT |
| NWDAFRoamingAnalyticsNotification | REPORT |

The threeGPP33128DefinedIRI field (see ETSI TS 102 232-7 [10] clause 15) shall be populated with the BER-encoded IRIPayload.

**\*\*\* End of Second Change \*\*\***

**\*\*\* Start of Third Change \*\*\***

---a/33128/r18/TS33128Payloads.asn
+++b/33128/r18/TS33128Payloads.asn

@@ -251,7 +251,14 @@ XIRIEvent ::= CHOICE

251 251 ePSRANHandoverCommand [148] EPSRANHandoverCommand,

252 252 ePSRANHandoverRequest [149] EPSRANHandoverRequest,

253 253 mMERANTraceReport [150] MMERANTraceReport,

254 - mMEUEServiceAccept [151] MMEUEServiceAccept

 254 + mMEUEServiceAccept [151] MMEUEServiceAccept,

 255 +

 256 + --NWDAF events, see clause 7.X.2

 257 + nWDAFEventsSubscription [152] NWDAFEventsSubscription,

 258 + nWDAFEventsNotification [153] NWDAFEventsNotification,

 259 + nWDAFAnalyticsInfoQuery [154] NWDAFAnalyticsInfoQuery,

 260 + nWDAFRoamingAnalyticsSubscription [155] NWDAFRoamingAnalyticsSubscription,

 261 + nWDAFRoamingAnalyticsNotification [156] NWDAFRoamingAnalyticsNotification

255 262 }

256 263

257 264 -- ==============

@@ -495,7 +502,14 @@ IRIEvent ::= CHOICE

495 502 ePSRANHandoverCommand [148] EPSRANHandoverCommand,

496 503 ePSRANHandoverRequest [149] EPSRANHandoverRequest,

497 504 mMERANTraceReport [150] MMERANTraceReport,

498 - mMEUEServiceAccept [151] MMEUEServiceAccept

 505 + mMEUEServiceAccept [151] MMEUEServiceAccept,

 506 +

 507 + --NWDAF events, see clause 7.X.3

 508 + nWDAFEventsSubscription [152] NWDAFEventsSubscription,

 509 + nWDAFEventsNotification [153] NWDAFEventsNotification,

 510 + nWDAFAnalyticsInfoQuery [154] NWDAFAnalyticsInfoQuery,

 511 + nWDAFRoamingAnalyticsSubscription [155] NWDAFRoamingAnalyticsSubscription,

 512 + nWDAFRoamingAnalyticsNotification [156] NWDAFRoamingAnalyticsNotification

499 513 }

500 514

501 515 IRITargetIdentifier ::= SEQUENCE

@@ -4994,6 +5008,130 @@ FiveGMSAFErrorCode ::=ENUMERATED

4994 5008 unsupportedMediaType415(4)

4995 5009 }

4996 5010

 5011 + -- =================

 5012 + -- NWDAF definitions

 5013 + -- =================

 5014 +

 5015 + NWDAFEventsSubscription ::=SEQUENCE

 5016 + {

 5017 + sUPI [1] SUPI,

 5018 + nWDAFConsumerNFType [2] NWDAFConsumerNFType,

 5019 + nWDAFEventsSubscriptionOpType [3] NWDAFEventsSubscriptionOpType,

 5020 + nWDAFSubscribedEventList [4] SET OF NWDAFEvent OPTIONAL,

 5021 + nWDAFEventsSubscription [5] SBIType OPTIONAL,

 5022 + nWDAFEventsSubscriptionID [6] UTF8String OPTIONAL,

 5023 + nWDAFEventsSubscriptionResponseCode [7] NWDAFEventsSubscriptionResponseCode

 5024 + }

 5025 +

 5026 + NWDAFEventsNotification ::=SEQUENCE

 5027 + {

 5028 + sUPI [1] SUPI,

 5029 + nWDAFNotifiedEventList [2] SET OF NWDAFEvent,

 5030 + nWDAFEventsNotification [3] SBIType

 5031 + }

 5032 +

 5033 + NWDAFAnalyticsInfoQuery ::=SEQUENCE

 5034 + {

 5035 + sUPI [1] SUPI,

 5036 + nWDAFEvent [2] NWDAFEvent,

 5037 + nWDAFEventReportingRequirement [3] SBIType OPTIONAL,

 5038 + nWDAFEventFilter [4] SBIType OPTIONAL,

 5039 + nWDAFAnalyticsData [5] SBIType OPTIONAL,

 5040 + nWDAFAnalyticsInfoResponseCode [6] NWDAFAnalyticsInfoResponseCode

 5041 + }

 5042 +

 5043 + NWDAFRoamingAnalyticsSubscription ::=SEQUENCE

 5044 + {

 5045 + sUPI [1] SUPI,

 5046 + pLMNID [2] PLMNID,

 5047 + nWDAFEventsSubscriptionOpType [3] NWDAFEventsSubscriptionOpType,

 5048 + nWDAFSubscribedEventList [4] SET OF NWDAFEvent OPTIONAL,

 5049 + nWDAFEventsSubscription [5] SBIType OPTIONAL,

 5050 + nWDAFEventsSubscriptionID [6] UTF8String OPTIONAL,

 5051 + nWDAFEventsSubscriptionResponseCode [7] NWDAFEventsSubscriptionResponseCode

 5052 + }

 5053 +

 5054 + NWDAFRoamingAnalyticsNotification ::=SEQUENCE

 5055 + {

 5056 + sUPI [1] SUPI,

 5057 + nWDAFNotifiedEventList [2] SET OF NWDAFEvent,

 5058 + nWDAFEventsNotification [3] SBIType

 5059 + }

 5060 +

 5061 + -- ==============

 5062 + -- NWDAF parameters

 5063 + -- ==============

 5064 +

 5065 + NWDAFEventsSubscriptionOpType ::= ENUMERATED

 5066 + {

 5067 + pOST(1),

 5068 + pUT(2),

 5069 + dELETE(3)

 5070 + }

 5071 +

 5072 + NWDAFEventsSubscriptionResponseCode ::= ENUMERATED

 5073 + {

 5074 + oK200(1),

 5075 + created201(2),

 5076 + noContent204(3),

 5077 + temporaryRedirect307(4),

 5078 + permanentRedirect308(5),

 5079 + badRequest400(6),

 5080 + unauthorized401(7),

 5081 + forbidden403(8),

 5082 + notFound404(9),

 5083 + notAcceptable406(10),

 5084 + lengthRequired411(11),

 5085 + payloadTooLarge413(12),

 5086 + unsupportedMediaType415(13),

 5087 + tooManyRequests429(14),

 5088 + internalServerError500(15),

 5089 + notImplemented501(16),

 5090 + badGateway502(17),

 5091 + serviceUnavailable503(18)

 5092 + }

 5093 +

 5094 + NWDAFAnalyticsInfoResponseCode ::= ENUMERATED

 5095 + {

 5096 + oK200(1),

 5097 + noContent204(2),

 5098 + badRequest400(3),

 5099 + unauthorized401(4),

 5100 + forbidden403(5),

 5101 + notFound404(6),

 5102 + notAcceptable406(7),

 5103 + uRITooLong414(8),

 5104 + tooManyRequests429(9),

 5105 + internalServerError500(10),

 5106 + badGateway502(11),

 5107 + serviceUnavailable503(12)

 5108 + }

 5109 +

 5110 + NWDAFConsumerNFType ::= ENUMERATED

 5111 + {

 5112 + pCF(1),

 5113 + nSSF(2),

 5114 + aMF(3),

 5115 + sMF(4),

 5116 + nEF(5),

 5117 + aF(6),

 5118 + lMF(7),

 5119 + oAM(8),

 5120 + nWDAF(9),

 5121 + dCCF(10),

 5122 + cEF(11)

 5123 + }

 5124 +

 5125 + NWDAFEvent ::= ENUMERATED

 5126 + {

 5127 + serviceExperience(1),

 5128 + uEMobility(2),

 5129 + uEComm(3),

 5130 + abnormalBehaviour(4),

 5131 + dispersion(5),

 5132 + relativeProximity(6),

 5133 + pDUSessionTraffic(7)

 5134 + }

4997 5135

4998 5136 -- ===================

4999 5137 -- 5G LALS definitions

**\*\*\* End of Third Change \*\*\***

**\*\*\* End of Last Change \*\*\***