**3GPP TSG- Meeting #**

**Maastricht, Netherlands, 19 – 23 August 2024**

|  |
| --- |
| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  |  | **CR** |  | **rev** | **1** | **Current version:** |  |  |
|  |
| *For* [***HELP***](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** |

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|  |
| ***Title:***  |  |
|  |  |
| ***Source to WG:*** |  |
| ***Source to TSG:*** | S5 |
|  |  |
| ***Work item code:*** |  |  | ***Date:*** |  |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***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:*** | TS 23.501 defines the reference point N28, N40, N41 and N42. But the the trace record content for N28, N40, N41 and N42 interfaces for tracing is missing. |
|  |  |
| ***Summary of change:*** | Adding the trace record content for N28, N40, N41 and N42 interfaces for tracing. |
|  |  |
| ***Consequences if not approved:*** | No trace record description available for N28, N40, N41 and N42 interfaces and hence cannot be traced by 3GPP trace functionality. Misalignment with TS 23.501. |
|  |  |
| ***Clauses affected:*** | 4.18, 4.19, 4.20 |
|  |  |
|  | **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 32.421 CR 0141TS 32.422 CR 0475TS 28.623 CR 0403 |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

***Start of First change***

## 4.18 AMF Trace Record Content

The following table shows the trace record content for AMF.

The trace record is the same for management based activation and for signalling based activation.

AMF shall support at least one of the following trace depth levels – Maximum, Medium or Minimum.

Table 4.18.1 : AMF Trace Record Content

|  |  |  |  |
| --- | --- | --- | --- |
| **Interface (specific messages)** | **Format** | **Level of details** | **Description** |
| **Min** | **Med** | **Max** |
| N1 | Decoded | **M** | **M** | **O** | Message name  |
| **O** | **O** | **O** | Record extensions |
| **M** | **M** | **X** | ID of the connected gNB-CU-CP node/ng-eNBID of the traced AMF |
| **O** | **O** | **X** | IE extracted from N1 messages between the traced AMF and the gNB-CU-CP/ng-eNB node. |
| ASN.1 | **X** | **X** | **M** | Raw Messages: N1 messages between the traced AMF and the gNB-CU-CP/ng-eNB node. The encoded content of the message is provided. |
| N1 NAS PDU IE | Encoded\* | **X** | **X** | **M** | Hexdata dump of the decrypted NAS message formatted according to 3GPP TS 24.501 [x10], sections 8 and 9, recorded as a separate message entry in the call trace file |
| N8 | Decoded | **M** | **M** | **O** | Message name  |
| **O** | **O** | **O** | Record extensions |
| **M** | **M** | **X** | UDM ID of the connected UDMAMF ID of the traced AMF |
| **O** | **O** | **X** | IE extracted from N8 messages between the traced AMF and the UDM. |
| Encoded\* | **X** | **X** | **M** | Raw N8 messages between the traced AMF and the UDM. The encoded content of the message is provided |
| N11 | Decoded | **M** | **M** | **O** | Message name  |
| **O** | **O** | **O** | Record extensions |
| **M** | **M** | **X** | SMF ID of the connected SMFAMF ID of the traced AMF |
| **O** | **O** | **X** | IE extracted from N11 messages between the traced AMF and the SMF. |
| Encoded\* | **X** | **X** | **M** | Raw N11 messages between the traced AMF and the SMF. The encoded content of the message is provided |
| N12 | Decoded | **M** | **M** | **O** | Message name  |
| **O** | **O** | **O** | Record extensions |
| **M** | **M** | **X** | AUSF ID of the connected AUSFAMF ID of the traced AMF |
| **O** | **O** | **X** | IE extracted from N12 messages between the traced AMF and AUSF. |
| Encoded\* | **X** | **X** | **M** | Raw N12 messages between the traced AMF and AUSF. The encoded content of the message is provided |
| N14 | Decoded | **M** | **M** | **O** | Message name  |
| **O** | **O** | **O** | Record extensions |
| **M** | **M** | **X** | AMF ID of the connected AMFAMF ID of the traced AMF |
| **O** | **O** | **X** | IE extracted from N14 messages between the traced AMF and another AMF. |
| Encoded\* | **X** | **X** | **M** | Raw N14 messages between the traced AMF and another AMF. The encoded content of the message is provided |
| N15 | Decoded | **M** | **M** | **O** | Message name  |
| **O** | **O** | **O** | Record extensions |
| **M** | **M** | **X** | PCF ID of the connected PCFAMF ID of the traced AMF |
| **O** | **O** | **X** | IE extracted from N15 messages between the traced AMF and PCF. |
| Encoded\* | **X** | **X** | **M** | Raw N15 messages between the traced AMF and PCF. The encoded content of the message is provided |
| N20 | Decoded | **M** | **M** | **O** | Message name  |
| **O** | **O** | **O** | Record extensions |
| **M** | **M** | **X** | SMSF ID of the connected SMSFAMF ID of the traced AMF |
| **O** | **O** | **X** | IE extracted from N20 messages between the traced AMF and SMSF. |
| Encoded\* | **X** | **X** | **M** | Raw N20 messages between the traced AMF and SMSF. The encoded content of the message is provided |
| N22 | Decoded | **M** | **M** | **O** | Message name  |
| **O** | **O** | **O** | Record extensions |
| **M** | **M** | **X** | NSSF ID of the connected NSSFAMF ID of the traced AMF |
| **O** | **O** | **X** | IE extracted from N22 messages between the traced AMF and NSSF. |
| Encoded\* | **X** | **X** | **M** | Raw N22 messages between the traced AMF and NSSF. The encoded content of the message is provided |
| N26 | Decoded | **M** | **M** | **O** | Message name  |
| **O** | **O** | **O** | Record extensions |
| **M** | **M** | **X** | MME ID of the connected MMEAMF ID of the traced AMF |
| **O** | **O** | **X** | IE extracted from N26 messages between the traced AMF and MME. |
| Encoded\* | **X** | **X** | **M** | Raw N26 messages between the traced AMF and MME. The encoded content of the message is provided |
| N41 | Decoded | **M** | **M** | **O** | Message name  |
| **O** | **O** | **O** | Record extensions |
| **M** | **M** | **X** | CHF ID of the connected CHF in H-PLMNAMF ID of the traced AMF |
| **O** | **O** | **X** | IE extracted from N41 messages between the traced AMF and CHF in H-PLMN. |
| Encoded\* | **X** | **X** | **M** | Raw N41 messages between the traced AMF and CHF in H-PLMN. The encoded content of the message is provided |
| N42 | Decoded | **M** | **M** | **O** | Message name  |
| **O** | **O** | **O** | Record extensions |
| **M** | **M** | **X** | CHF ID of the connected CHF in V-PLMNAMF ID of the traced AMF |
| **O** | **O** | **X** | IE extracted from N42 messages between the traced AMF and CHF in V-PLMN. |
| Encoded\* | **X** | **X** | **M** | Raw N42 messages between the traced AMF and CHF in V-PLMN. The encoded content of the message is provided |

Encoded\* - the messages are left encoded in the format it was received.

***Start of next change***

## 4.19 SMF Trace Record Content

The following table shows the trace record content for SMF.

The trace record is the same for management based activation and for signalling based activation.

SMF shall support at least one of the following trace depth levels – Maximum, Medium or Minimum.

Table 4.19.1 : SMF Trace Record Content

|  |  |  |  |
| --- | --- | --- | --- |
| **Interface (specific messages)** | **Format** | **Level of details** | **Description** |
| **Min** | **Med** | **Max** |
| N4 | Decoded | **M** | **M** | **O** | Message name  |
| **O** | **O** | **O** | Record extensions |
| **M** | **M** | **X** | UPF ID of the connected UPF nodeSMF ID of the traced SMF |
| **O** | **O** | **X** | IE extracted from N4 messages between the traced SMF and the UPF. |
| Encoded\* | **X** | **X** | **M** | Raw Messages: N4 messages between the traced SMF node and the UPF. The encoded content of the message is provided. |
| N7 | Decoded | **M** | **M** | **O** | Message name  |
| **O** | **O** | **O** | Record extensions |
| **M** | **M** | **X** | PCF ID of the connected PCFSMF ID of the traced SMF |
| **O** | **O** | **X** | IE extracted from N7 messages between the traced SMF and PCF. |
| Encoded\* | **X** | **X** | **M** | Raw N7 messages between the traced SMF and PCF. The encoded content of the message is provided |
| N10 | Decoded | **M** | **M** | **O** | Message name  |
| **O** | **O** | **O** | Record extensions |
| **M** | **M** | **X** | UDM ID of the connected UDMSMF ID of the traced SMF |
| **O** | **O** | **X** | IE extracted from N10 messages between the traced SMF and the UDM. |
| Encoded\* | **X** | **X** | **M** | Raw N10 messages between the traced SMF and the UDM. The encoded content of the message is provided |
| N11 | Decoded | **M** | **M** | **O** | Message name  |
| **O** | **O** | **O** | Record extensions |
| **M** | **M** | **X** | AMF ID of the connected AMFSMF ID of the traced SMF |
| **O** | **O** | **X** | IE extracted from N11 messages between the traced SMF and the AMF. |
| Encoded\* | **X** | **X** | **M** | Raw N11 messages between the traced SMF and the AMF. The encoded content of the message is provided |
| S5-C | Decoded | **M** | **M** | **O** | Message name  |
| **O** | **O** | **O** | Record extensions |
| **M** | **M** | **X** | PGW ID of the connected PGWSMF ID of the traced SMF |
| **O** | **O** | **X** | IE extracted from S5-C messages between the traced SMF and PGW. |
| Encoded\* | **X** | **X** | **M** | Raw S5-C messages between the traced SMF and PGW. The encoded content of the message is provided |
| N16 | Decoded | **M** | **M** | **O** | Message name  |
| **O** | **O** | **O** | Record extensions |
| **M** | **M** | **X** | V-SMF ID of the connected V-SMFSMF ID of the traced SMF |
| **O** | **O** | **X** | IE extracted from N16 messages between the traced SMF and V-SMF. |
| Encoded\* | **X** | **X** | **M** | Raw N16 messages between the traced SMF and V-SMF. The encoded content of the message is provided |
| N16a | Decoded | **M** | **M** | **O** | Message name  |
| **O** | **O** | **O** | Record extensions |
| **M** | **M** | **X** | I-SMF ID of the connected I-SMFSMF ID of the traced SMF |
| **O** | **O** | **X** | IE extracted from N16a messages between the traced SMF and I-SMF. |
| Encoded\* | **X** | **X** | **M** | Raw N16a messages between the traced SMF and I-SMF. The encoded content of the message is provided |
| N38 | Decoded | **M** | **M** | **O** | Message name  |
| **O** | **O** | **O** | Record extensions |
| **M** | **M** | **X** | I-SMF ID of the connected I-SMF or V-SMF ID of the connected V-SMFSMF ID of the traced SMF |
| **O** | **O** | **X** | IE extracted from N38 messages between the traced I-SMFs or V-SMFs. |
| Encoded\* | **X** | **X** | **M** | Raw N38 messages between the traced I-SMFs or V-SMFs. The encoded content of the message is provided |
| N40 | Decoded | **M** | **M** | **O** | Message name  |
| **O** | **O** | **O** | Record extensions |
| **M** | **M** | **X** | CHF ID of the connected CHFSMF ID of the traced SMF |
| **O** | **O** | **X** | IE extracted from N40 messages between the traced SMF and CHF. |
| Encoded\* | **X** | **X** | **M** | Raw N40 messages between the traced SMF and CHF. The encoded content of the message is provided |

Encoded\* - the messages are left encoded in the format it was received.

***Start of next change***

## 4.20 PCF Trace Record Content

The following table shows the trace record content for PCF.

The trace record is the same for management based activation and for signalling based activation.

PCF shall support at least one of the following trace depth levels – Maximum, Medium or Minimum.

Table 4.20.1 : PCF Trace Record Content

|  |  |  |  |
| --- | --- | --- | --- |
| **Interface (specific messages)** | **Format** | **Level of details** | **Description** |
| **Min** | **Med** | **Max** |
| N5 | Decoded | **M** | **M** | **O** | Message name  |
| **O** | **O** | **O** | Record extensions |
| **M** | **M** | **X** | AF ID of the connected AFPCF ID of the traced PCF |
| **O** | **O** | **X** | IE extracted from N5 messages between the traced PCF and the AF. |
| ASN.1 | **X** | **X** | **M** | Raw Messages: N5 messages between the traced PCF and the AF. The encoded content of the message is provided. |
| N7 | Decoded | **M** | **M** | **O** | Message name  |
| **O** | **O** | **O** | Record extensions |
| **M** | **M** | **X** | SMF ID of the connected SMFPCF ID of the traced PCF |
| **O** | **O** | **X** | IE extracted from N7 messages between the traced PCF and SMF. |
| Encoded\* | **X** | **X** | **M** | Raw N7 Messages: messages between the traced PCF and SMF. |
| N15 | Decoded | **M** | **M** | **O** | Message name  |
| **O** | **O** | **O** | Record extensions |
| **M** | **M** | **X** | AMF ID of the connected AMFPCF ID of the traced PCF |
| **O** | **O** | **X** | IE extracted from N15 messages between the traced PCF and the AMF. |
| Encoded\* | **X** | **X** | **M** | Raw N15 messages between the traced PCF and the AMF. The encoded content of the message is provided |
| N28 | Decoded | M | M | O | Message name  |
| O | O | O | Record extensions |
| M | M | X | CHF ID of the connected CHFPCF ID of the traced PCF |
| O | O | X | IE extracted from N28 messages between the traced PCF and the CHF. |
| Encoded\* | X | X | M | Raw N28 messages between the traced PCF and the CHF. The encoded content of the message is provided |

Encoded\* - the messages are left encoded in the format it was received.

***End of Changes***