**3GPP TSG-CT WG3 Meeting #142 *C3-253089***

**Gothenburg, SE, 25 - 29 August 2025 (Revision of C3-253089)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  |  | **CR** | **0196** | **rev** | **1** | **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** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Forward compatibility support for N6 e2e encrypted traffic | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** |  | | | | | | | | | |
| ***Source to TSG:*** | C3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | XRM\_Ph2 | | | | |  | ***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 can be 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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | According to TS 29.561 clause 22, Forward compatibility of N6 e2e encrypted traffic support is not achieveable.  when Proxying UDP in HTTP datagram, media-related information is not accompanied by an explicit length specification. If a future release increases the length of the MRI field with new elements and an updated bitmask, the Rel-19 UPF will be unable to determine the MRI field's boundary due to the unknown length of the new elements. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | A new length field is introduced for Proxying UDP in HTTP datagram mechanism. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The specified N6 e2e encrypted traffic handing defined in this release will remain incompatible for future updates. This lack of forward compatibility will prevent proper integration of future enhancements, potentially causing interworking issues and operational inefficiencies. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 22.2, 22.3.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\* \* \* \* First Change \* \* \* \*

## 22.2 Media Related Information

Media Related Information supporting information fields as defined in 3GPP TS 23.501 [2] shall be byte-aligned and coded as shown in Figure 22.2.1 and Table 22.2.1.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | | | | | | | | | | 1 | | | | | | | | | | 2 | | | | | | | | | | 3 | |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 |
| Ver | | | Bitmask | | | | | | | | | | | | | E | R | | D | PSI | | | | PSSN | | | | | | | |
| Cont | | PSN | | | | | | PSSize | | | | | | | | | | | | | | | | | | | | | | | |
| NPDS | | | | | | | | | | | | | | | | BSize | | | | | | | | | | | | | | | |
| Cont | | | | | | | | TTNB | | | | | | | | | | | | | | | | | | | | | | | |
| I | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Figure 22.2.1: Media Related Information

Table 22.2.1: Media Related Information

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Media Related Information | | | | | | | | | | | |
|  | | | | | | | | | | | |
| Ver (octet 0, bits 0 through 2) | | | | | | | | | | | |
| These bits are associated with the version of the Media Related Information.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | 0 | 0 | 0 |  | Value for the version of the Media Related Information in this release | | | | | | | | | | | | |
|  | | | | | | | | | | | |
| Bitmask (octet 0, bit 3) | | | | | | | | | | | |
| 0 |  | | |  | | |  | | Bits representing PDU Set marking not present | | |
| 1 |  | | |  | | |  | | Bits representing PDU Set marking present | | |
|  | | | | | | | | | | | |
| Bitmask (octet 0, bit 4) (NOTE 1) | | | | | | | | | | | |
| 0 |  | | |  | | |  | | Bits representing PDU Set Size (PSSize) not present | | |
| 1 |  | | |  | | |  | | Bits representing PDU Set Size (PSSize) present | | |
|  | | | | | | | | | | | |
| Bitmask (octet 0, bit 5) (NOTE 1) | | | | | | | | | | | |
| 0 |  | | |  | | |  | | Bits representing Number of PDUs in the PDU Set (NPDS) not present | | |
| 1 |  | | |  | | |  | | Bits representing Number of PDUs in the PDU Set (NPDS) present | | |
|  | | | | | | | | | | | |
| Bitmask (octet 0, bit 6) | | | | | | | | | | | |
| 0 |  | | |  | | |  | | Bits representing Burst Size (BSize) not present | | |
| 1 |  | | |  | | |  | | Bits representing Burst Size (BSize) present | | |
|  | | | | | | | | | | | |
| Bitmask (octet 0, bit 7) | | | | | | | | | | | |
| 0 |  | | |  | | |  | | Bits representing Time To Next Burst (TTNB) not present | | |
| 1 |  | | |  | | |  | | Bits representing Time To Next Burst (TTNB) present | | |
|  | | | | | | | | | | | |
| Bitmask (octet 1, bit 0) | | | | | | | | | | | |
| 0 |  | | |  | | |  | | Bits representing Expedited Transfer Indication (I) not present | | |
| 1 |  | | |  | | |  | | Bits representing Expedited Transfer Indication (I) present | | |
|  | | | | | | | | | | | |
| Bitmask (octet 1, bits 1 through 6) | | | | | | | | | | | |
| These bits are spared and shall be set to zero. | | | | | | | | | | | |
|  | | | | | | | | | | | |
| Bitmask (octet 1, bit 7) | | | | | | | | | | | |
| Extension for the bitmask by 8 bits, if the existing bits are exhausted and new bits are needed to represent new fields in Media Related Information (NOTE 2). | | | | | | | | | | | |
| 0 | | |  | | |  | |  | | | Bitmask is not extended by 8 bits |
| 1 | | |  | | |  | |  | | | Bitmask is extended by 8 bits |
|  | | | | | | | | | | | |
| End PDU of the PDU Set (1 bit) | | | | | | | | | | | |
| If PDU Set marking is included, this bit is encoded as End PDU of the PDU Set (E) field of the PDU Set marking as defined in 3GPP TS 26.522 [68]. | | | | | | | | | | | |
|  | | | | | | | | | | | |
| Reserved (2 bits) | | | | | | | | | | | |
| If PDU Set marking is included, these bits are encoded as Reserved (R) field of the PDU Set marking as defined in 3GPP TS 26.522 [68]. | | | | | | | | | | | |
|  | | | | | | | | | | | |
| End of Data Burst (1 bit) | | | | | | | | | | | |
| If PDU Set marking is included, this bit is encoded as End of Data Burst (D) field of the PDU Set marking as defined in 3GPP TS 26.522 [68]. | | | | | | | | | | | |
|  | | | | | | | | | | | |
| PDU Set Importance (4 bits) | | | | | | | | | | | |
| If PDU Set marking is included, this bit is encoded as PDU Set Importance (PSI) field of the PDU Set marking as defined in 3GPP TS 26.522 [68]. | | | | | | | | | | | |
|  | | | | | | | | | | | |
| PDU Set Sequence Number (10 bits) | | | | | | | | | | | |
| If PDU Set marking is included, these bits are encoded as with PDU Set Sequence Number (PSSN) field of the PDU Set marking as defined in 3GPP TS 26.522 [68]. | | | | | | | | | | | |
|  | | | | | | | | | | | |
| PDU Sequence Number within the PDU Set (6 bits) | | | | | | | | | | | |
| If PDU Set marking is included, these bits are encoded as PDU Sequence Number within the PDU Set (PSN) field of the PDU Set marking as defined in 3GPP TS 26.522 [68]. | | | | | | | | | | | |
|  | | | | | | | | | | | |
| PDU Set Size (24 bits) | | | | | | | | | | | |
| If PDU Set marking is included, these bits are encoded as PDU Set Size (PSSize) field of the PDU Set marking as defined in 3GPP TS 26.522 [68]. | | | | | | | | | | | |
|  | | | | | | | | | | | |
| Number of PDUs in the PDU Set (16 bits) | | | | | | | | | | | |
| If PDU Set marking is included, these bits are encoded as Number of PDUs in the PDU Set (NPDS) field of the PDU Set marking as defined in 3GPP TS 26.522 [68]. | | | | | | | | | | | |
|  | | | | | | | | | | | |
| Burst Size (24 bits) | | | | | | | | | | | |
| If Burst Size is included, these bits are encoded as Burst Size (BSize) field of the Dynamically Changing Traffic Characteristics marking as defined in 3GPP TS 26.522 [68]. | | | | | | | | | | | |
|  | | | | | | | | | | | |
| Time To Next Burst (24 bits) | | | | | | | | | | | |
| If Time To Next Burst is included, these bits are encoded as Time To Next Burst (TTNB) field of the Dynamically Changing Traffic Characteristics marking as defined in 3GPP TS 26.522 [68]. | | | | | | | | | | | |
|  | | | | | | | | | | | |
| Expedited Transfer Indication (1 bit) | | | | | | | | | | | |
| If Expedited Transfer Indication is included, this bit corresponds to Expedited Transfer Indication (I) field as defined in 3GPP TS 23.501 [2] and is encoded to the value: | | | | | | | | | | | |
| 0 | |  | | |  | |  | | | false | |
| 1 | |  | | |  | |  | | | true | |
|  | | | | | | | | | | | |
| All other additional zero-padding bits shall be ignored. | | | | | | | | | | | |
|  | | | | | | | | | | | |
| NOTE 1: This bit represents an optional field of the PDU Set marking, see 3GPP TS 26.522 [68]. If the PDU Set marking are not included in the Media Related Information, this bit shall be set to zero and the associated bits representing the optional field shall not be included in the Media Related Information. | | | | | | | | | | | |
| NOTE 2: The extension for the bitmask may be repeated by assigning 1 to the last bit i.e., bit 7 of the previous extension. If the bitmask is extended with additional bits, those unused bits of the bitmask extension are spare and shall be set to zero. | | | | | | | | | | | |

Editor's Note: Whether the spare bits will be version for the MRI is FFS.

\* \* \* \* Next changes \* \* \* \*

### 22.3.2 Sending Media Related Information using proxying UDP in HTTP Datagram

To establish a connect-UDP tunnel as defined in IETF RFC 9298 [64], the HTTP client in the UPF shall include in the HTTP/3 CONNECT request:

a) the :protocol pseudo-header set to connect-udp; and

b) the 3gpp-Connect-Req-Inband-Info header defined in Annex A.3 with the intended-inband-purpose parameter set to "MRI".

EXAMPLE 1: 3gpp-Connect-Req-Inband-Info header in HTTP CONNECT request message for the format that includes the media related information in the HTTP Datagram payload:

3gpp-Connect-Req-Inband-Info: intended-inband-purpose=MRI

Upon successfully establishing the connection, the HTTP server (AS proxy) shall return a 2XX response including the 3gpp-Connect-Resp-Inband-Info header defined in Annex A.3 with:

a) the inband-purpose parameter set to "MRI" indicating that the AS will send Media Related Information as defined in clause 22.2, in HTTP Datagrams; and

b) the context-id parameter set to a non-zero odd value registered by the AS for the Context ID that will be used in HTTP Datagrams carrying Media Related Information.

EXAMPLE 2: 3gpp-Connect-Resp-Inband-Info header in HTTP CONNECT response message indicating successfully established connection with the registered Context ID (decimal) value 7:

3gpp-Connect-Resp-Inband-Info: inband-purpose=MRI; context-id=0b111

Upon receipt of the successful 2XX response as per IETF RFC 9298 [64], the UPF shall consider that the UDP tunnel is established to receive HTTP Datagrams carrying Media Related Information with the AS registered Context ID, received in the 3gpp-Connect-Resp-Inband-Info header.

Editor's Note: 3gpp-Connect-Req-Inband-Info header and 3gpp-Connect-Resp-Inband-Info header need to be IANA registered.

If the HTTP client in the UPF chooses to reuse the QUIC connection to the HTTP server for multiple UEs, the UPF shall open a different QUIC stream for the HTTP/3 CONNECT request issued for each UE.

The HTTP client in the UPF may use different QUIC connections to the HTTP server for multiple UEs, each connection with a separate TLS security context as per IETF RFC 9114 [65].

When the Media Related Information is encapsulated in HTTP Datagrams of the connect-UDP tunnel, then the HTTP server (AS proxy) shall encode the HTTP Datagram payload format as below:

a) Context ID with format defined in IETF RFC 9298 [64], set to an odd number, derived as per the above procedure; and

Editor's Note: The description for Context ID and ABNF is FFS.

b) a payload containing:

1) The length of the Media Related Information, encoded as one octet and indicating the length of the MRI in number of bytes.

2) Media Related Information with the format as defined in clause 22.2; and

3) UDP proxying payload.

Upon receipt of the HTTP Datagram with the Context ID registered as the value indicated in the 3gpp-Connect-Resp-Inband-Info header, the UPF shall extract the Media Related Information from the HTTP Datagram payload for DL transmission in the GTP-U header as defined in 3GPP TS 23.501 [2].

NOTE: The UDP proxying payload of the HTTP Datagram payload contains application data which is end-to-end encrypted between the UE and the Application Server.

\* \* \* \* End of Changes \* \* \* \*