**3GPP TSG- Meeting # *S4-250511***

**Online, 11th April 2025 – 17th April 2025**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** |  | **rev** |  | **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 | **X** | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** | [5G\_RTP\_Ph2] Expedited Transfer Indication addition to RTP HE for dynamic traffic characteristics | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Lenovo, Meta USA | | | | | | | | | |
| ***Source to TSG:*** | S4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5G\_RTP\_Ph2 | | | | |  | ***Date:*** | | | 2025-04-11 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-19 |
|  | *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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The Stage-2 design in TS 23.501 specifies the Expedited Transfer Indication flag as being part of dynamic traffic characteristics and as being carried over a RTP header extension in user plane. The current description of RTP HE for dynamically changing traffic characteristics does not contain such an Expedited Transfer Indication flag. As such, this gap needs to be addressed. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | * Added Expedited Transfer Indication flag to RTP HE for dynamic traffic characteristics * Typo corrections | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Stage-3 aspects of Stage-2 are left incomplete | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, 4.5 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 \* \* \* \*

# 2 References

[21] 3GPP TS 26.114: "IP Multimedia Subsystem (IMS); Multimedia Telephony; Media handling and interaction".

[x1] 3GPP TS 26.113: "Real-Time Media Communication; Protocols and APIs".

\* \* \* \* Second change \* \* \* \*

## 4.5 RTP header extension for dynamically changing traffic characteristics

### 4.5.1 Description

Data bursts can be present in RTP streams, such as video, audio or other RTP streams quite often, due to the periodic nature of the streams. Determining dynamically changing traffic characteristics regarding data bursts can be beneficial for the 5G System, e.g., for power saving and efficient radio resource management.

The RTP HE for dynamically changing traffic characteristics is defined in this clause for marking dynamically changing traffic characteristics at an RTP sender.

The dynamically changing traffic characteristics are defined in 3GPP TS 23.501 [12], clause 5.37.10. In this release, the following characteristics are supported in the RTP HE for dynamically changing traffic characteristics:

- Data Burst Size

- Time to Next Burst

- Expedited Transfer Indication

Dynamically changing traffic characteristics marking can be performed by an RTP sender, such as an Application Server, a sender UE that sends media to an RTP receiver, such as another UE.

Endpoints that support the RTP HE for dynamically changing Traffic Characteristics shall support both RTP HE formats (i.e., the one-byte and the two-byte formats) according to RFC 8285 [11].

If the RTP HE for dynamically changing traffic characteristics is the only RTP HE used, the endpoints shall use the 1-byte header format. If other 2-byte RTP HE elements are used in the same RTP stream, then the 2-byte header shall be used, unless the "a=extmap-allow-mixed" is successfully negotiated through SDP offer/answer, as described by RFC 8285 [11].

NOTE: The headers are not shown with padding as this depends on other prospective extension elements in use, as per RFC 8285 [11] alignment specifications.

The IANA registration information for the RTP HE for RTP HE for dynamically changing traffic characteristics is presented in Annex D.5.

### 4.5.2 One-byte RTP header extension format

The one-byte RTP HE for the marking of dynamically changing traffic characteristics is defined as follows:

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

+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+

| 0xBE | 0xDE | length |

+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+

| ID | len | R |B| BSize

+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+

| TTNB |

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### 4.5.3 Two-byte RTP Header Extension Format

The two-byte RTP HE for the marking of dynamically changing traffic characteristics is defined as follows:

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

+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+

| 0x100 |appbits| length |

+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+

| ID | len | R |B| BSize

+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+

| TTNB |

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### 4.5.4 Semantics

The semantics of the fields of the RTP HE for marking dynamically changing traffic characteristics are defined as follows:

- **Reserved [R] (7 bits):** This field is reserved for future usage. It shall be set to 0 by the RTP sender and shall be ignored by the RTP receiver.

- **Expedited Transfer Indication [B] (1 bit):** This field indicates the RTP sender data rate boosting preference for the current PDU. It shall be set to 1 to indicate the preference for expedited transfer. Otherwise, it shall be set to 0.

- **Burst Size [BSize] (24 bits):** The Burst Size indicates the total size of the burst to be transmitted (in bytes (including the overhead of the RTP Header). If the burst size is not known, it shall be set to 0.

NOTE 1: If a packager generates all packets of the burst at once, no additional delay is introduced when setting the burst size, as the packets can be marked with the complete burst size. If this is not the case (e.g. multiple frames combined in one burst) a delay as large as the burst duration could be introduced by marking the entire burst. Therefore, this approach may not be suitable for all types of packagers/encoders, especially those that gradually produce packets additional latency may be introduced if the size is not known in advance.

- **Time To Next Burst [TTNB] (16 bits):** Indicates the approximate time in tenth of milliseconds to the next burst. If the time to next burst is not known, it shall be set the reserved value 65535.

NOTE 2: The definition of time to next burst in this context is for further study

### 4.5.5 SDP Signaling

An RTP sender capable of sending RTP HE for dynamically changing traffic characteristics shall use the SDP extmap attribute for RTP HE for dynamically changing traffic characteristics in the media description of the RTP stream(s) carrying the RTP HE for dynamically changing traffic characteristics. An RTP receiver that does not support RTP HE for dynamically changing traffic characteristics can ignore that RTP HE when included. The signaling of the RTP HE for dynamically changing traffic characteristics shall follow the SDP signaling design and the syntax and semantics of the "extmap" attribute as outlined in RFC 8285. The URN for the dynamically changing traffic characteristics marking shall be set to "**urn:3gpp:dynamic-traffic-characteristics:rel-19**".

The ABNF syntax for the extmap attribute for the signaling of RTP HE for dynamically changing traffic characteristics is defined as follows, extending the ABNF in RFC 8285:

*extensionname = "* *urn:3gpp:sa4:5grtp:dynamic-traffic-characteristics:rel-19"*

*format = "short" / "long"*

The extension attributes have the following semantics:

- format: indicates if the RTP HE for dynamically changing traffic characteristics uses the 1-byte (short) or the 2-byte (long) format. This extension attribute can not be included more than once.

NOTE: Regardless of whether this extension attribute is present or not, the use of long or short format is determined as described by section 4.1.2 of RFC 8285, i.e., based on what format other RTP HEs use in the same RTP session, unless both endpoints announced support for handling mixed format with "a=extmap-allow-mixed" as described by section 6 of RFC 8285 [7].

Below is an example:

a=extmap:7 dynamic-traffic-characteristics:rel-19 long

### 4.5.6 Guidelines forsignallingdynamically changing traffic characteristics

For data burst dynamic traffic characteristics (e.g., Data Burst Size, Time to Next Burst), it is recommended that the first several RTP packets and the last few RTP packets of a data burst contain the dynamically changing traffic characteristics signalling. In addition, some additional RTP packets may contain the RTP HE for dynamically changing traffic characteristics.

The RTP sender may decide on how frequently to add the RTP HE for dynamically changing traffic characterstics based on different factors such as configuration (as defined in TS 26.113 [x1], clause 10.3), estimated packet losses or other network conditions. The RTP HE for dynamically changing traffic characteristics is consumed by the core network, i.e., the UPF, as defined in 3GPP TS 23.501 [12], clause 5.37.10.

When the Expedited Transfer Indication feature is enabled (see TS 26.113 [x1], clause 10.3), RTP packets that are not to be expedited by the network shall not be marked by the RTP sender with the RTP HE for dynamically changing traffic characteristics. For the duration that the RTP sender wishes to enable the data rate boosting, it shall mark all RTP packets that are to be expedited by the network with the RTP HE for dynamically changing traffic characteristics, signaling the data rate boosting preference of the RTP sender (see clause 4.5.4).

The RTP sender should simultaneously not egress RTP packets alternating Expedited Transfer Indication values. When Expedited Transfer Indication is signaled along with at least one of burst size or time to next burst, it is recommended that the RTP sender marks all RTP packets of a data burst with the same Expedited Transfer Indication value.

\* \* \* \* End of changes \* \* \* \*