**3GPP TSG-SA WG4 Meeting ad hoc post #131-bis-e S4-250760**

**Electronic, 30th April–8th May 2024** *revision of S4aR250105*

Title: Exploitation of new QoS handling support by the RTC System

Source: BBC

Agenda Item: 10.6 (5G\_RTP\_Ph2)

Document for: Discussion and agreement

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# Abstract

This Discussion Paper critiques the scope of the 5G\_RTP\_Ph2 Work Item.

# Introduction

Based on the conclusions of the *FS\_5G\_RTP\_Ph2* feasibility study documented in TR 26.822 [1] a new stage-3 Work Item *5G\_RTP\_Ph2* [2] was approved at the SA#106 (Madrid) meeting which targets the following Release 19 deliverables:

* TS 26.522 [3] to specify stage-3 RTP header extensions and other RTP configurations relating to the RTC System.
* TS 26.113 [4] for changes to stage-3 procedures and API usages by the RTC System.
* TS 26.510 [5] for changes to stage-3 provisioning and media session handling aspects of the generalised media delivery system shared by the RTC System and the 5GMS System.

Three key **traffic detection and handling** features introduced into the 5G System in Release 19 by SA2 are identified by the feasibility study as being especially useful for managing **XR traffic** belonging to the RTC System as it passes through the underlying User Plane:

1. Detection and special handling by the UPF of **unmarked (“lone”) downlink PDUs at reference point N6**. For example, RTCP packets carried in an SRTP session are not part of any PDU Set.
2. Detection and special handling by the UPF of downlink PDUs with **dynamically changing traffic characteristics**:
	1. The Application Server marks downlink PDUs with **data burst size**.
	2. The Application Server marks downlink PDUs in an application flow with the predicted **time to next burst**.
	3. The Application Server marks a subset of downlink PDUs in an application flow with an **expedited transfer indication**.
3. Detection and special handling by the UPF of downlink PDUs in the case where **multiple media flows are multiplexed onto a single application data flow**.

# Summary of Work Item status

The following table summarises the status of work for the 5G\_RTP\_Ph2 Work Item at the end of the SA4#131-bis e-meeting held during April 2025.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Feature | Sub-feature | Traffic detection feature |  | Exploitation of traffic detection feature in the RTC System |
| Stage-2 definition | Stage-3 specification |  | Stage-2 definition | Stage-3 specification |
| TS 23.501 Rel‑19 | TS 26.522 Rel‑19 |  | TS 26.506 Rel‑19 | TS 26.113 Rel‑19 | TS 26.510 Rel‑19 |
| N6-unmarked (“lone”) PDUs | Related LS **[S4-250738]** sent to SA2 from SA4#131-bis-e. It is expected that SA2 will agree in SA2#169 a corresponding CR to TS 23.501 that extends the Protocol Description with the information for N6-unmarked PDUs and specify the corresponding UPF handling. | Clause 6.1*unmarked-pdu-info* attribute in SDP offer/answer26522-CR**0012***(Serhan, Nokia)***S4-250708***(a)* |  | Need to reference TS 23.501 and map feature concept to its embodiment in RTC System. | 26113-CR**0005***(Serhan, Nokia)***S4-250683***(e)* | Dynamic Policy invoker needs to include the indication of desired PSI for N6-unmarked PDUs in the media transport parameters for downlink PDUs.26510-CR**0023rev1***(Serhan, Nokia)***S4-250879** [SA4#132] |
| Dynamically changing traffic character­istics | Data burst size marking | Clause 5.37.10 “Supporting dynamically changing traffic characteristics via the User Plane” | Clause 4.5.1*RTP Header Extension for Dynamically Changing Traffic Characteristics Marking**(Rufael, Huawei)*26522-CR**0006****S4-250349***(a)* |  | Need to reference TS 23.501 and map feature concept to its embodiment in RTC System. | 26113-CR**0008rev1***(Andrei, Lenovo)***S4-250999**[SA4#132] | 26510-CR**0018rev1***(Andrei, Lenovo)***S4-250997**[SA4#132] |
| Time to next burst marking |
| Expedited transfer indication marking | Clause 4.x*RTP Header Extension for Expedited Transfer Indication*26522-CR**0021***(Andrei, Lenovo)***S4-250996** [SA4#132] |
| Multiplexed media identification marking | Clause 5.37.11 “Traffic identification and differentiated QoS for multiplexed media flows” | Clauses C.2.2 and C.2.3*RTP SDES Header Extension for MID*26522-CR**0016***(Srinivas, InterDigital)***S4-250724***(a)* |  | Need to reference TS 23.501 and map feature concept to its embodiment in RTC System. | 26113-CR**0010rev2***(Srinivas, InterDigital)***S4-250898**[SA4#132] | 26510-CR**0019rev2***(Srinivas, InterDigital)***S4- 250906** [SA4#132] |

# Critique

It may be observed from the table in section 3 above that stage-3 CRs to TS 26.522 are backed by stage-2 feature definitions provided by SA2 in TS 23.501. These define the basic functionality of the **5G System** required to support each feature. Ultimately, this requires the UPF to detect in-scope PDUs (e.g., by inspecting RTP header extensions) and give them appropriate QoS treatment. Procedures to configure this behaviour in the PCF, SMF and UPF are defined.

Regarding the inclusion of these features in the **RTC System**, on the other hand, only stage-3 Change Requests have been drafted so far. No attempt has been made to define the usage of these features in the corresponding stage-2 technical specification of the RTC System, TS 26.506 [6]. Without appropriate stage-2 normative text, the intended use of these new features in the RTC System (“**procedures**”) remains undefined at stage-2. In the 3GPP standardisation process, it is not permitted for a stage-2 specification to be inconsistent with its corresponding stage-3 specification(s). Without proper motivation at stage-2, new features are not formally in scope of the RTC System, and hence no stage-3 changes can be agreed.

# Coordination of code changes to OpenAPI YAML

Some of the proposed changes to TS 26.510 [5] involve changes to APIs at reference point M1 (RTC‑1) and M5 (RTC‑5). As well as changes to normative text clauses, the Change Requests need to specify the corresponding OpenAPI YAML code modifications. Moreover, it is important that the changes to the APIs agreed to satisfy the requirements of the *5G\_RTP\_Ph2* Work Item do not conflict with API changes being worked on in parallel by the *AMD\_PRO-MED* Work Item which also targets TS 26.510 [5] in Release 19.

To avoid conflicts, the MBS subworking group has agreed that all OpenAPI YAML changes for the *AMD\_PRO-MED* Work Item will be prototyped on separate **feature branches** of a project on 3GPP Forge prior to CR agreement, and a **Merge Request** created for each one to bring all the changes onto a common REL-19 branch prior to seeking SA Plenary approval.

The project repository used for prototyping in Release 19 is:

<https://forge.3gpp.org/rep/sa4/amd-pro-med>

An example of a feature branch on this project repository is:

<https://forge.3gpp.org/rep/sa4/amd-pro-med/-/tree/cmcd>

An example of a Merge Request from this feature branch onto the main REL-19 branch of this project repository is:

<https://forge.3gpp.org/rep/sa4/amd-pro-med/-/merge_requests/1>

It would be highly desirable to verify that the separate API changes successfully integrate with each other (i.e., with no conflicts) prior to sending CRs to TSG SA Plenary for approval at the end of the Work Item. The working practice adopted by the CT Working Groups to achieve this goal is to merge Change Requests that modify APIs in a given deliverable into a single CR prior to Working Group agreement. In the context of the above project repository, the separate Merge Requests would also be merged into the main REL-19 branch to test for schema validity when combined.

When the changes are sent to TSG SA for approval, they are merged into a draft branch of the 5G\_APIs repository. Only when the changes are formally approved are they merged into the REL-19 branch of the 5G\_APIs repository.

# Proposals for further discussion

# Proposal

It is proposed that the RTC subworking group agrees to:

1. Bring forward stage-2 normative updates to TS 26.506 [6] defining procedures for the usage of the new traffic detection features listed in section 2 of the present document in the RTC System. In order to do this, the **existing stage-3 Work Item Description** for 5G\_RTP\_Ph2 [2] at the forthcoming SA2#132 meeting to include TS 26.506 as an impacted deliverable at stage-2 and to specify the tasks required.
2. Prototype all **OpenAPI YAML code changes** to TS 26.113 [4] and TS 26.510 [5] on 3GPP Forge to demonstrate error-free syntax as a condition of agreement, and include a copy of these code changes in the corresponding CR immediately after the cover page.
(Each CR should do this on a separate 3GPP Forge feature branch of an SA4 project repository.)
3. *(Highly desirable)* Merge all SWG-agreed changes to TS 26.113 [4] into a single CR prior to Working Group agreement, including a copy of all OpenAPI YAML code changes immediately after the cover page.
4. *(Highly desirable)* Merge all SWG-agreed changes to TS 26.510 [5] into a single CR prior to Working Group agreement, including a copy of all OpenAPI YAML code changes immediately after the cover page.

# References

1. 3GPP TR 26.822: "Study on 5G Real-time Transport Protocol Configurations, Phase 2 ", Release 19
2. SP-241961|S4241672: "5G Real-time Transport Protocol Configurations, Phase 2", Release 19 Work Item Description.
3. 3GPP TS 26.522: "Real-time Media Transport Protocol Configurations", Release 19.
4. 3GPP TS 26.113: "Real-Time Media Communication; Protocols and APIs", Release 19.
5. 3GPP TS 26.510: "Media delivery; interactions and APIs for provisioning and media session handling", Release 19.
6. 3GPP TS 26.506: "5G Real-time Media Communication Architecture (Stage 2)", Release 19.