**3GPP TSG-SA WG4 Meeting #131S4-250144**

**CH, Geneva, 17 – 21 February 2025**

**Source: Nokia**

**Title: [5G\_RTP\_Ph2] PSI signaling for lone PDUs**

**Agenda item: 10.6**

**Document for: Agreement**

# Introduction

5G\_RTP\_Ph2 has the following objective based on conclusions for the key issue #2 in TR 26.822:

* Extend the RTC provisioning feature in TS 26.510 and TS 26.113 to include PDU Set Importance values for PDUs that may be treated as lone PDUs in the UPF.

This contribution summarizes the solution in TR 26.822 related to the above objective and outlines the steps that need to be taken by SA4.

# Background

As of Rel-18, there is no mechanism to mark PDUs carrying protocol data other than RTP. Thus, PDUs belonging to protocols such as RTCP, STUN, etc. cannot be marked.

In Rel-18, SA2 has agreed that the PSA UPF marks, in the downlink, each N6-unmarked PDU ("lone PDU") with PDU Set Information into a PDU Set. If the UPF receives a PDU that does not belong to a PDU Set based on Protocol Description for PDU Set identification, the UPF still maps it to a PDU Set and determines the PDU Set Information by implementation-specific means.

For lone PDUs, the PDU Set Information must be determined by the UPF. However, the UPF may only assign a pre-defined PSI value (e.g. by the network operator) for the PDU Set Importance (PSI). It is more desirable that the PSI value is provided by the sender application since it generates the content and thus is in the best position to determine the PSI.

#### Solution from TR 26.822

The solution proposed in TR 26.822 defines a mapping between a set of PSI values and non-RTP protocols that are used in the media delivery session, which is provided by the the Media Application Provider

The mapping can be provided using the RTC provisioning feature of the media delivery session, defined in **TS 26.510.** The RTC Media Application Provider adds a property *lonePduInfoList* to the *RTCConfiguration* resource that will be relayed to the RTC Media Session Handler for usage with RTC sessions of that RTC Application Provider.

The property *lonePduInfoList* contains an array of *lonePduInfo* objects as defined below.

Table 6.15.2.2-1: Definition of *lonePduInfo* object

| Property name | Data Type | Cardinality | Description |
| --- | --- | --- | --- |
| protocol | string | 1..1 | Protocol information such as RTCP, STUN, etc. |
| packetType | integer | 0..1 | Packet type specific to the protocol. |
| pduSetImportance | integer | 1..1 | PSI value between 0 and 15 (inclusive). |

If a *lonePduInfoList* is provided, the Media AF extends the*mediaTransport‌Parameters* property of the Application Flow Description that it has received from the Media Session Handler with the information in the *lonePduInfoList*. The Media AF then sends the Application Flow Description to the 5G Core, where the*mediaTransport‌Parameters* (with the typeProtocol Description defined in TS 29.571

) is passed to the UPF. For example, the Protocol Description may then have the following structure after addition of the property *lonePduInfoList*:

{ "transportProto": "RTP",

 "rtpPayloadInfoList": [{"rtpPayloadFormat": "H265", "rtpPayloadTypeList": [96]}],

 "**lonePduInfoList"**: [{"protocol": "RTCP", pduSetImportance: 5},

 {"protocol": "STUN", pduSetImportance: 2}],

}

#### Analysis and impact of the solution

The benefit of the proposed solution is that the UPF does not have to rely on a pre-defined value (e.g. provided by the network operator) to determine the PSI for lone PDUs and can make a more reliable decision based on a PSI mapping provided by the Media Application Provider.

In terms of UPF processing, complexity is not increased because the UPF only needs to inspect the packet headers (e.g. the RTCP header) to check for packet type.

The impacted entities in the 5G System are:

**Real-time Media Provisioning API (TS 26.510)**

- *RTCConfiguration* provided by the Media Application Provider is extended with the lone PDU information.

**RTC AF (TS 26.113)**

- Receives the extended *RTCConfiguration* and adds it to the Application Flow Description.

**5G Core Network (SA2, CT4)**

- UPF receives the extended Protocol Description and parses the *lonePduInfoList* property to retrieve the PSI mapping for lone PDUs.

# Proposal

* Endorse a CR to TS 26.113 on aspects related to dynamic policy aspects for PDU Set parameters.
	+ NOTE: The related CR to TS 26.113 is in [S4-250222](https://www.3gpp.org/ftp/tsg_sa/WG4_CODEC/TSGS4_131_Geneva/Docs/S4-250222.zip).
* Endorse a CR to TS 26.510 on aspects related to RTC provisioning.
	+ NOTE: The related CR TS 26.510 is in [S4-250221](https://www.3gpp.org/ftp/tsg_sa/WG4_CODEC/TSGS4_131_Geneva/Docs/S4-250221.zip).
* Prepare an LS to SA2 to ask:
	+ SA2 to extend their specifications to retrieve the PSI mapping for N6-unmarked PDUs from the extended Protocol Description and pass it to the RAN.

# Annex

The definition of Protocol Description from TS 29.571 v19.1.0 is copied below for reference.

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

#### 5.5.4.13 Type ProtocolDescription

Table 5.5.4.13-1: Definition of type ProtocolDescription

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description |
| transportProto | MediaTransportProto | O | 0..1 | When present, this IE shall indicate the transport protocol used by the media flow.  |
| rtpHeaderExtInfo | RtpHeaderExtInfo | C | 0..1 | This IE shall be present if RTP or SRTP is used and the RTP payload packets contains a RTP Header Extension that can be used for PDU Set identification and/or End of Data Burst marking.When present, this IE shall contain information on the RTP header extension that can be used for PDU Set identification and/or End of Data Burst marking.(NOTE 1) |
| rtpPayloadInfoList | array(RtpPayloadInfo) | O | 1..N | When present, it shall contain RTP Payload information for the RTP stream, which can be used to derive the PDU Set information and/or End of Data Burst marking.(NOTE 1) (NOTE 2) |
| NOTE 1: If the rtpPayloadInfoList is present and contains one or more Payload Type values, the UPF may only parse the RTP packets with an RTP header containing any of these Payload Type value(s). Otherwise, if the rtpPayloadInfoList is absent or does not contain any Payload Type value, the UPF should parseall the RTP packets of the media flow and use either the RTP Header Extension if included, or the Payload format to derive the PDU set information (see Guidelines for PDU Set identification in clauses A.1 and A.2 of 3GPP TS 26.522 [59]).NOTE 2: In this release of the specification, the rtpPayloadInfoList contains only one RtpPayloadInfo element.NOTE 3: Vendor/operator specific attributes may be supported as defined in clause 6.6.3 of 3GPP TS 29.500 [25]. |

EXAMPLE 1: For a media flow using RTP transport with:
- the RTP Header Extension for PDU Set Marking (see clause 4.4.2 of 3GPP TS 26.522 [59]);
- the RTP header extension Id "3";
- RTP packets with different PTs, where packets with PT 96 contain the RTP Header Extension,

the Protocol Description is set to:

 { "transportProto": "RTP", "rtpHeaderExtInfo": { "rtpHeaderExtType": "PDU\_SET\_MARKING", "rtpHeaderExtId": 3}, "rtpPayloadInfoList": [{ "rtpPayloadTypeList": [ 96 ]}]}

EXAMPLE 2: For a media flow using RTP transport:
- not using any RTP Header Extension for PDU Set identication;
- H.265 payload format with Payload Types 96 and 97 (see clause A.2.3 (RTP with HEVC payload format) of 3GPP TS 26.522 [59]);

the Protocol Description is set to:

 { "transportProto": "RTP", "rtpPayloadInfoList": [{"rtpPayloadFormat": "H265", "rtpPayloadTypeList": [96, 97]}]}