

**Agenda Item:** 9.1

**Source:** Ericsson

**Title:** Frame coding of PDU type 0 for Support Mode for predefined SDU size

**Document for:** Decision

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## **1 Introduction**

In TS 25.415, [1], the coding of PDU type 0 is described. This PDU type is used for both control data and user data.

This contribution proposes to have separate type of frames for Iu UP procedure control and for user data. This makes the Iu protocol simpler and the Iu frames faster to process (due to simpler, fixed sized heading). This is also in line with the principles used on Iub.

The PDU type 0 is proposed to carry user data. Another type of frame, PDU type 15 (see [2]), is used for control data in the Iu UP. This contribution also proposes the sizes of the checksums used, as well as the generator polynomials used for calculating the checksums. There is another contribution [4] describing the fields for frame classification.

## **2 PDU type 0**

### **2.1 Iu UP Frame Format and Content definition**

Figure 1 below shows the Iu frame structure of the Iu UP protocol at the SAP towards the transport layers:

Bits								Number of Octets	
7	6	5	4	3	2	1	0		
PDU Type				Frame Number				1	Frame Control Part
FQC		RFCI						1	
PDU type 0 Payload CRC		PDU type 0 Header CRC						2	Frame Check Sum Part
PDU type 0 Payload CRC									
Payload Fields								0-n	Frame Payload part

**Figure 1: lu UP PDU Type 0 Format**

### 2.1.1 PDU type

Not changed, see [1].

### 2.1.2 Frame number

Not changed, see [1].

### 2.1.3 RFCI

Not changed, see [1].

### 2.1.4 FQC (Frame Quality Classification)

See contribution on frame quality classification [3].

### 2.1.5 PDU type 0 Header CRC

This field contains the CRC of all fields in Frame Control Part. The CRC is a 6-bit checksum based on the generator polynom  $G(D) = D^6 + D^5 + D^3 + D^2 + D^1 + 1$ . See [3].

With this CRC all error bursts shorter than 7 bits are detected, as well as all odd number of bits faulty (and two-bit faults) when the protected area is shorter than 24 bits, (max 3 octets).

### 2.1.6 PDU type 0 Payload CRC

This field contains the CRC of the Frame Payload. The CRC is a 10-bit checksum based on the generator polynom  $G(D) = D^{10} + D^9 + D^5 + D^4 + D^1 + 1$  (see [3]).

With this CRC all error bursts shorter than 11 bits are detected, as well as all odd number of bits faulty (and two-bit faults) when the protected area is shorter than 500 bits (max 62 octets).

### **3 Proposal**

It is proposed to change the coding of PDU type 0 in [1] so that is in line with chapter 2 above. The chapters 2.1.5 and 2.1.6 above is to replace the Iu frame checksums in [1] (section 6.6.3).

### **4 References**

- [1] TS 25.415 (V1.0.2) Iu Interface CN-UTRAN User Plane Protocol
- [2] TSGR3#7(99)B52, Frame coding for PDU type 15 for Support Mode for predefined SDU size
- [3] TSGR3#7(99)C10, CRC Lengths in the frame protocol
- [4] TSGR3#7(99)B54, Frame classification in Iu UP for Support Mode