**3GPP TSG-RAN 2 Meeting #**

**, ,**

|  |
| --- |
| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  |  | **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)*.* |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

|  |
| --- |
|  |
| ***Title:***  |  |
|  |  |
| ***Source to WG:*** |  |
| ***Source to TSG:*** |  |
|  |  |
| ***Work item code:*** | IoT\_NTN\_enh-Core |  | ***Date:*** |  |
|  |  |  |  |  |
| ***Category:*** | **A** |  | ***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 canbe 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:*** | At RAN2#125bis it was agreed for NR NTN and IoT NTN to use konsistent terminology throughout the stage 2 specification: * use Kmac throughout the stage 2, and refer to the RRC parameter name *k-Mac* when Kmac is introduced.
	+ The same principle is applied to IoT NTN.

This CR implements the Kmac changes for IoT NTN. |
|  |  |
| ***Summary of change:*** | 1. Add “(RRC parameter *k-Mac*)” when Kmac is introduced, and change “kmac” to “Kmac” in figure 23.21.2.1-1.
 |
|  |  |
| ***Consequences if not approved:*** | The usage of Kmac is not consistent in stage 2 specification. |
|  |  |
| ***Clauses affected:*** | 23.21.2.1 |
|  |  |
|  | **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:*** |  |

|  |
| --- |
| START OF CHANGE |

#### 23.21.2.1 Scheduling timing

DL and UL are frame aligned at the uplink time synchronization reference point (RP) with an offset given by $N\_{TA,offset} $(see clause 8 of TS 36.211 [4]).

To accommodate the long propagation delays in NTN, several timing relationships are enhanced by a Common Timing Advance (Common TA) and two offsets: $K\_{offset}$ and $K\_{mac}$:

- $Common TA$ is a configured timing offset that is equal to the RTT between the RP and the NTN payload.

- $K\_{offset}$ is a configured scheduling offset that needs to be larger or equal to the sum of the service link RTT and the Common TA.

- $K\_{mac}$ is a configured offset (RRC parameter *k-Mac*) that is approximately equal to the RTT between the RP and the eNB.

The scheduling offset $K\_{offset}$ is used to allow the UE sufficient processing time between a downlink reception and an uplink transmission, see TS 36.213 [6].

The offset $K\_{mac}$ is used to delay the application of a downlink configuration indicated by a MAC CE received on NPDSCH/PDSCH, see TS 36.213 [6], and to determine the UE-eNB RTT, see TS 36.321 [13]. It may be provided by the network when downlink and uplink frame timing are not aligned at eNB. The $K\_{mac}$ is also used in the random access procedure, to determine the start time of random access response window after a random access preamble transmission (see TS 36.213 [6]).

The Service link RTT, Feeder link RTT, the RP, the Common TA, $K\_{mac}$ and TTA (see clause 23.21.2.2) are illustrated in Figure 23.21.2.1-1.



Figure 23.21.2.1-1: Illustration of timing relationship (for collocated eNB and NTN Gateway)

The network may configure the HARQ operation as follows:

- For downlink, HARQ feedback can be enabled or disabled per HARQ process (by dedicated RRC signalling and/or DCI based indication). Disabling HARQ feedback allows scheduling a HARQ process before one HARQ RTT has elapsed since last scheduled;

- For uplink, HARQ mode (i.e. HARQ mode A or HARQ mode B) can be configured per HARQ process (as specified in clause 5.4.3.1 and clause 5.7 of TS 36.321 [13]). HARQ mode B allows scheduling a HARQ process before one HARQ RTT has elapsed since last scheduled. HARQ mode configuration is not applicable for PUR transmissions.

NOTE: For the HARQ processes configured with HARQ feedback enabled/disabled, it is up to network implementation to ensure a proper configuration of HARQ feedback (e.g., either all enabled or all disabled) for HARQ processes used by a downlink SPS configuration. For the HARQ processes configured with HARQ mode, it is up to network implementation to ensure a proper configuration of HARQ mode (e.g., either all HARQ mode A or all HARQ mode B) for HARQ processes used by an uplink SPS configuration.

|  |
| --- |
| END OF CHANGE |