**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 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-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 (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: and :

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

- is a configured scheduling offset that needs to be larger or equal to the sum of the service link RTT and the Common TA.

- is a configured offset (RRC parameter *k-Mac*) that is approximately equal to the RTT between the RP and the eNB.

The scheduling 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 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 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, 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 |