**3GPP TSG-RAN WG1#84bis R1-163925**

**Busan, Korea, 11th - 15th April 2016**

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| *CR-Form-v11* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **36.213** | **CR** | **0649** | **rev** | **-** | **Current version:** | **13.1.1** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

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| ***Title:*** | Initial CCA Behaviour in the Channel Access Procedure | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | R1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | LTE\_LAA-Core | | | | |  | | ***Date:*** | | 2016-04-12 |
|  |  | | | |  | | |  | |  |
| ***Category:*** | **F** |  | | | | | | ***Release:*** | | Rel-13 |
|  | *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-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6) Rel-7 (Release 7) Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) Rel-12 (Release 12) Rel-13 (Release 13)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The initial CCA behaviour was not properly captured and this was also pointed out in the liaison statements from IEEE and the Wi-Fi Alliance | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | The channel access procedure has been modified so that the eNB starts a new random backoff when the channel is sensed to be busy when the eNB is ready to transmit after finishing a prior backoff and not transmitting. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The channel access procedure will not correctly capture the initial CCA procedure. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 15.1.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

### 15.1.1 Channel access procedure for transmission(s) including PDSCH

The eNB may transmit a transmission including PDSCH on a channel on which LAA Scell(s) transmission(s) are performed , after first sensing the channel to be idle during the slot durations of a defer duration ; and after the counter is zero in step 4. The counter  is adjusted by sensing the channel for additional slot duration(s) according to the steps below:

1) set , where  is a random number uniformly distributed between 0 and , and go to step 4;

2) if  and the eNB chooses to decrement the counter, set ;

3) sense the channel for an additional slot duration, and if the additional slot duration is idle, go to step 4; else, go to step 5;

4) if , stop; else, go to step 2.

5) sense the channel during the slot durations of an additional defer duration ;

6) if the channel is sensed to be idle during the slot durations of the additional defer duration , go to step 2; else, go to step 5;

If an eNB has not transmitted a transmission including PDSCH on a channel on which LAA Scell(s) transmission(s) are performed after step 4 in the procedure above, the eNB may transmit a transmission including PDSCH on the channel, if the channel is sensed to be idle at least in a slot duration  when the eNB is ready to transmit PDSCH. If the channel has not been sensed to be idle in a slot duration  when the eNB first senses the channel after it is ready to transmit, the eNB proceeds to step 1 after sensing the channel to be idle during the slot durations of a defer duration .

The defer duration  consists of duration immediately followed by consecutive slot durations where each slot duration is , and includes an idle slot duration at start of ;

A slot duration is considered to be idle if the eNB senses the channel during the slot duration, and the power detected by the eNB for at least within the slot duration is less than energy detection threshold . Otherwise, the slot duration  is considered to be busy.

is the contention window. adjustment is described in sub clause 15.1.3.

and are chosen before step 1 of the procedure above.

, , and are based on channel access priority class associated with the eNB transmission, as shown in Table 15.1.1-1.

 adjustment is described in sub clause 15.1.4

If the eNB transmits discovery signal transmission(s) not including PDSCH when in the procedure above, the eNB shall not decrement N during the slot duration(s) overlapping with discovery signal transmission.

The eNB shall not continuously transmit on a channel on which the LAA Scell(s) transmission(s) are performed, for a period exceeding as given in Table 15.1.1-1.

For and  , if the absence of any other technology sharing the carrier can be guaranteed on a long term basis (e.g. by level of regulation), , otherwise, .

Table 15.1.1-1: Channel Access Priority Class

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Channel Access Priority Class () |  |  |  |  | allowed sizes |
| 1 | 1 | 3 | 7 | 2 ms | {3,7} |
| 2 | 1 | 7 | 15 | 3 ms | {7,15} |
| 3 | 3 | 15 | 63 | 8 or 10 ms | {15,31,63} |
| 4 | 7 | 15 | 1023 | 8 or 10 ms | {15,31,63,127,255,511,1023} |

For LAA operation in Japan, if the eNB has transmitted a transmission after in step 4 of the procedure above, the eNB may transmit the next continuous transmission, for duration of maximum =4 msec, immediately after sensing the channel to be idle for at least a sensing interval of =34usec and if the total sensing and transmission time is not more than  µsec. consists of duration immediately followed by two slot durations  each and includes an idle slot duration at start of . The channel is considered to be idle for if it is sensed to be idle during the during the slot durations of .