8.2 Random access response - Type-1 random access procedure

-------Unchanged part omitted---------------------

If the UE detects the DCI format 1\_0 with CRC scrambled by the corresponding RA-RNTI, and the LSBs of SFN field in the DCI format 1\_0, if included and applicable, match the LSBs of the SFN in which the PRACH is transmitted, and the UE receives a transport block in a corresponding PDSCH within the window, the UE passes the transport block to higher layers. The higher layers parse the transport block for a random access preamble identity (RAPID) associated with the PRACH transmission. If the higher layers identify the RAPID in RAR message(s) of the transport block, the higher layers indicate an uplink grant to the physical layer. This is referred to as random access response (RAR) UL grant in the physical layer.

If the UE does not detect the DCI format 1\_0 with CRC scrambled by the corresponding RA-RNTI within the window, or if the UE detects the DCI format 1\_0 with CRC scrambled by the corresponding RA-RNTI within the window but the LSBs of SFN field in the DCI format 1\_0, if included and applicable, do not match the LSBs of the SFN in which the PRACH is transmitted, or if the UE does not correctly receive the transport block in the corresponding PDSCH within the window, or if the higher layers do not identify the RAPID associated with the PRACH transmission from the UE, the higher layers can indicate to the physical layer to transmit a PRACH. If requested by higher layers, the UE is expected to transmit a PRACH no later than  msec after the last symbol of the window, or the last symbol of the PDSCH reception, where  is a time duration of  symbols corresponding to a PDSCH processing time for UE processing capability 1 assuming  corresponds to the smallest SCS configuration among the SCS configurations for the PDCCH carrying the DCI format 1\_0, the corresponding PDSCH when additional PDSCH DM-RS is configured, and the corresponding PRACH. For , the UE assumes  [6, TS 38.214]. For a PRACH transmission using 1.25 kHz or 5 kHz SCS, the UE determines  assuming SCS configuration .

If the UE detects a DCI format 1\_0 with CRC scrambled by the corresponding RA-RNTI and the LSBs of SFN field in the DCI format 1\_0, if included and applicable, match the LSBs of the SFN in which the PRACH is transmitted and the UE receives a transport block in a corresponding PDSCH, the UE may assume same DM-RS antenna port quasi co-location properties, as described in [6, TS 38.214], as for a SS/PBCH block or a CSI-RS resource the UE used for PRACH association, as described in Clause 8.1, regardless of whether or not the UE is provided *TCI-State* for the CORESET where the UE receives the PDCCH with the DCI format 1\_0.

If the UE attempts to detect the DCI format 1\_0 with CRC scrambled by the corresponding RA-RNTI in response to a PRACH transmission initiated by a PDCCH order that triggers a contention-free random access procedure for the SpCell [11, TS 38.321], the UE may assume that the PDCCH that includes the DCI format 1\_0 and the PDCCH order have same DM-RS antenna port quasi co-location properties. If the UE attempts to detect the DCI format 1\_0 with CRC scrambled by the corresponding RA-RNTI in response to a PRACH transmission initiated by a PDCCH order that triggers a contention-free random access procedure for a secondary cell, the UE may assume the DM-RS antenna port quasi co-location properties of the CORESET associated with the Type1-PDCCH CSS set for receiving the PDCCH that includes the DCI format 1\_0.

A RAR UL grant schedules a PUSCH transmission from the UE. The contents of the RAR UL grant, starting with the MSB and ending with the LSB, are given in Table 8.2-1.

If the value of the frequency hopping flag is 0, the UE transmits the PUSCH without frequency hopping; otherwise, the UE transmits the PUSCH with frequency hopping.

The UE determines the MCS of the PUSCH transmission from the first sixteen indexes of the applicable MCS index table for PUSCH as described in [6, TS 38.214].

The TPC command value  is used for setting the power of the PUSCH transmission, as described in Clause 7.1.1, and is interpreted according to Table 8.2-2.

The CSI request field is reserved.

The ChannelAccess-CPext field indicates a channel access type and CP extension for operation with shared spectrum channel access [15, TS 37.213].

-------Unchanged part omitted---------------------

Unless the UE is configured a SCS, the UE receives subsequent PDSCH using same SCS as for the PDSCH reception providing the RAR message.

If the UE does not detect the DCI format with CRC scrambled by the corresponding RA-RNTI, or if the UE does detect the DCI format 1\_0 with CRC scrambled by the corresponding RA-RNTI but the LSBs of SFN field in DCI format 1\_0, if included and applicable, do not match the LSBs of the SFN in which the PRACH is transmitted, or the UE does not correctly receive a corresponding transport block within the window, the UE procedure is as described in [11, TS 38.321].

8.2A Random access response - Type-2 random access procedure

-------Unchanged part omitted---------------------

If the UE detects the DCI format 1\_0, with CRC scrambled by the corresponding MsgB-RNTI, and the LSBs of SFN field in the DCI format 1\_0, if applicable, match the LSBs of the SFN in which the PRACH is transmitted, and the UE receives a transport block in a corresponding PDSCH within the window, the UE passes the transport block to higher layers. The higher layers indicate to the physical layer

- an uplink grant if the RAR message(s) is for fallbackRAR and a random access preamble identity (RAPID) associated with the PRACH transmission is identified, and the UE procedure continues as described in Clause 8.2 when the UE detects a RAR UL grant, or

- transmission of a PUCCH with HARQ-ACK information having ACK value if the RAR message(s) is for successRAR, where

- a PUCCH resource for the transmission of the PUCCH is indicated by PUCCH resource indicator field of 4 bits in the successRAR from a PUCCH resource set that is provided by *pucch-ResourceCommon*

- a slot for the PUCCH transmission is indicated by a PDSCH-to-HARQ\_feedback timing indicator field of 3 bits in the successRAR having a value $k$ from {1, 2, 3, 4, 5, 6, 7, 8} and, with reference to slots for PUCCH transmission having duration $T\_{slot}$, the slot is determined as $n+k+∆$, where $n$ is a slot of the PDSCH reception and $∆$ is as defined for PUSCH transmission in Table 6.1.2.1.1-5 of [6, TS 38.214]

- the UE does not expect the first symbol of the PUCCH transmission to be after the last symbol of the PDSCH reception by a time smaller than $N\_{T,1}+0.5$ msec where $N\_{T,1}$ is the PDSCH processing time for UE processing capability 1 [6, TS 38.214]

- for operation with shared spectrum channel access, a channel access type and CP extension [15, TS 37.213] for a PUCCH transmission is indicated by a ChannelAccess-CPext field in the successRAR

- the PUCCH transmission is with a same spatial domain transmission filter and in a same active UL BWP as a last PUSCH transmission

If the UE detects the DCI format 1\_0 with CRC scrambled by a C-RNTI and a transport block in a corresponding PDSCH within the window, the UE transmits a PUCCH with HARQ-ACK information having ACK value if the UE correctly detects the transport block or NACK value if the UE incorrectly detects the transport block and the time alignment timer is running [11, TS 38.321].

The UE does not expect to be indicated to transmit the PUCCH with the HARQ-ACK information at a time that is prior to a time when the UE applies a TA command that is provided by the transport block. If the UE does not detect the DCI format 1\_0 with CRC scrambled by the corresponding MsgB-RNTI within the window, or if the UE detects the DCI format 1\_0 with CRC scrambled by the corresponding MsgB-RNTI within the window but the LSBs of SFN field in the DCI format 1\_0, if applicable, do not match the LSBs of the SFN in which the PRACH is transmitted, or if the UE does not correctly receive the transport block in the corresponding PDSCH within the window, or if the higher layers do not identify the RAPID associated with the PRACH transmission from the UE, the higher layers can indicate to the physical layer to transmit only PRACH according to Type-1 random access procedure or to transmit both PRACH and PUSCH according to Type-2 random access procedure [11, TS 38.321]. If requested by higher layers, the UE is expected to transmit a PRACH no later than $N\_{T,1}+0.75$ msec after the last symbol of the window, or the last symbol of the PDSCH reception, where $N\_{T,1}$ is a time duration of $N\_{1}$ symbols corresponding to a PDSCH processing time for UE processing capability 1 when additional PDSCH DM-RS is configured. For $μ=0$, the UE assumes $N\_{1,0}=14$ [6, TS 38.214].

Unless the UE is configured a SCS, the UE receives subsequent PDSCH using same SCS as for the PDSCH reception providing the RAR message.

If the UE does not detect the DCI format with CRC scrambled by the corresponding MsgB-RNTI, or if the UE detects the DCI format 1\_0 with CRC scrambled by the corresponding MsgB-RNTI within the window but the LSBs of SFN field in DCI format 1\_0, if applicable, do not match the LSBs of the SFN in which the PRACH is transmitted, or the UE does not correctly receive a corresponding transport block within the window, the UE procedure is as described in [11, TS 38.321].

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