**3GPP TSG-RAN WG2 Meeting #124 *R2-23xxxxx***

**Chicago, USA, Nov. 13th – 17th, 2023**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.300** | **CR** | **0741** | **rev** | **1** | **Current version:** | **17.6.0** |  |
|  | | | | | | | | |
| *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:*** | Introduction of NR MUSIM enhancements in TS 38.300 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | China Telecom | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_DualTxRx\_MUSIM-Core | | | | |  | ***Date:*** | | | 2023-11-20 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Introduce the Dual Transmission/Reception (Tx/Rx) MUSIM for NR feature to the specification | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | * §20.1: modify the title of 20.X * §20.3: update description of UE notification on Network Switching * §20.X: modify the title of this clause, and add description for UE temporary capability restriction | | | | | | | | |
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| ***Consequences if not approved:*** | | No support for Dual Transmission/Reception (Tx/Rx) MUSIM for NR | | | | | | | | |
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| ***Clauses affected:*** | | * §20.1: General * §20.3: UE notification on Network Switching * §20.X: Temporary UE capability restriction and removal of restriction | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

<<<<Change start>>>>

# 20 Support for Multi-USIM devices

## 20.1 General

NG-RAN may support one or more of the following enhancements for MUSIM device operation:

- Paging Collision Avoidance, as described in clause 20.2;

- UE notification on Network Switching, as described in clause 20.3;

- Temporary UE capability restriction and removal of restriction, as described in clause 20.X.

## 20.2 Paging Collision Avoidance

The purpose of paging collision avoidance is to address the overlap of paging occasions on both USIMs when a MUSIM device (e.g. dual USIM device) is in RRC\_IDLE/RRC\_INACTIVE state in both the networks (e.g. Network A and Network B) associated with respective USIMs. Network A is NR and Network B is E-UTRA or NR.

A MUSIM device may determine potential paging collision on two networks and may trigger actions to prevent potential paging collision on NR network as specified in TS 23.501 [3].

NOTE: It is left to UE implementation as to how it selects one of the two RATs/networks for paging collision avoidance.

## 20.3 UE notification on Network Switching

For MUSIM operation, a MUSIM device in RRC\_CONNECTED state in Network A may have to switch from Network A to Network B. Network A is NR and Network B can either be E-UTRA or NR. Before switching from Network A, a MUSIM device should notify Network A to either leave RRC\_CONNECTED state, or be kept in RRC\_CONNECTED state in Network A while temporarily switching to Network B.

When configured to do so, a MUSIM device can signal to the Network A a preference to leave RRC\_CONNECTED state by using RRC (see TS 38.331 [12]) or NAS signalling (see TS 23.501 [3]). After sending a preference to leave RRC\_CONNECTED state by using RRC signalling, if the MUSIM device does not receive an *RRCRelease* message from the Network A within a certain time period (configured by the Network A, see TS 38.331 [12]), the MUSIM device can enter RRC\_IDLE state in Network A.

When configured to do so, a MUSIM device can signal to the Network A a preference to be temporarily switching to Network B while remaining in RRC\_CONNECTED state in Network. This is indicated by scheduling gaps preference.This preference can include information for setup or release of gap(s). The Network A can configure at most 4 gap patterns for MUSIM purpose: three periodic gaps and a single aperiodic gap. The Network A should always provide at least one of the requested gap pattern or no gaps. Network providing an alternative gap pattern instead of the one requested by the UE is not supported in this release.

When configured to do so, a MUSIM device can include priority of periodic gap(s) in addition to scheduling gaps preference, and the priority preference should be indicated for all periodic gap(s). If the MUSIM device indicates gap priority preference, it can also indicate its preference on using *keep solution* (defined in TS 38.133[13]).

## 20.X Temporary UE capability restriction and removal of restriction

For MUSIM operation, a MUSIM device in RRC\_CONNECTED state in Network A may indicate its preference on temporary UE capability restriction or removal of restriction with Network A when the MUSIM device needs transmission or reception in Network B (e.g., including start/stop connection to Network B). Network A is NR and Network B can either be E-UTRA or NR. The MUSIM device may request a temporary capability restriction only after the Network signals via RRC that this is allowed.

When configured to do so, a MUSIM device can indicate one or more of the following temporary capability restriction or removal of restriction to the Network A:

- A MUSIM device can explicitly request SCell(s) or SCG to be released;

- A MUSIM device can indicate its preference on temporary maximum MIMO layers and/or supported channel bandwidth for specific serving cells for both UL/DL;

- A MUSIM device can indicate its preference on the temporary maximum number of CCs per UL/DL;

- A MUSIM device can indicate its preference on the concerned band(s) or band combination(s) (e.g. forbidden and/or affected band(s) or band combination(s)) based on a band-filter list configured by network. For affected band(s) and band combination(s), this preference can include temporary maximum MIMO layers and/or supported channel bandwidth for both UL/DL;

- A MUSIM device can indicate the measurement gap requirement changes.When it is allowed by Network A in SIB1, a MUSIM device can indicate to the Network A that its capabilities are temporarily restricted in *RRCSetupComplete/RRCResumeComplete* message while the MUSIM device is already in RRC\_CONNECTED state in Network B.

When a MUSIM device is in RRC\_CONNECTED state in both Network A and Network B, if Network B is NR, it is up to UE implementation to select which network to request temporary UE capability restriction; if Network B is E-UTRA, the request for temporary UE capability restriction can only be performed on Network A.

<< End of changes >