**3GPP TSG-RAN WG4 Meeting # 98-e R4-2103543**

**Electronic Meeting, Jan. 25-Feb. 5, 2021**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **38.174** | **CR** | **Draft** | **rev** | **1** | **Current version:** | **16.1.0** |  |
|  |
| *For* [***HELP***](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 |  | Core Network |  |

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| --- |
|  |
| ***Title:***  | draftCR to introduce test cases for RRC release with redirection for IAB-MT |
|  |  |
| ***Source to WG:*** | Huawei, HiSilicon |
| ***Source to TSG:*** | R4 |
|  |  |
| ***Work item code:*** | NR\_IAB-Perf |  | ***Date:*** | 2020-12-30 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-16 |
|  | *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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | The test cases for RRC release with redirection should be added. |
|  |  |
| ***Summary of change:*** |  Introduce test cases for RRC release with redirection for IAB-MT based on the agreed specification structures in R4-2017117 |
|  |  |
| ***Consequences if not approved:*** | The performance testing requirements are incomplete |
|  |  |
| ***Clauses affected:*** | G.2.1.1.3 |
|  |  |
|  | **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 1>

#### G.2.1.1.3 RRC Connection Release with Redirection

##### G.2.1.1.3.1 Redirection from NR in FR1 to NR in FR1

G.2.1.1.3.1.1 Test Purpose and Environment

This test is to verify RRC connection release with redirection from NR to NR requirements specified in clause 12.1.1.3.

G.2.1.1.3.1.2 Test Parameters

Supported test configurations are shown in table G.2.1.1.3.1.2-1. The time delay is tested by using the parameters in table G.2.1.1.3.1.2-2, and G.2.1.1.3.1.2-3.

The test consists of two successive time periods, with time duration of T1, and T2 respectively. The *RRCRelease* message shall be sent to the IAB-MT during period T1 and the start of T2 is the instant when the last TTI containing the RRC message is sent to the IAB-MT. Prior to time duration T2, the IAB-MT shall not have any timing information of Cell 2. Cell 2 is powered up at the beginning of the T2.

Table G.2.1.1.3.1.2-1: Redirection from NR to NR test configurations

|  |  |
| --- | --- |
| Config | Description |
| 1 | Source cell: NR 15 kHz SSB SCS, TDD duplex modeTarget cell: NR 15 kHz SSB SCS, TDD duplex mode |
| 2 | Source cell: NR 30 kHz SSB SCS, TDD duplex modeTarget cell: NR 30 kHz SSB SCS, TDD duplex mode |
| Note 1: The IAB-MT is only required to be tested in one of the supported test configurations |

Table G.2.1.1.3.1.2-2: General test parameters for Redirection from NR to NR test case

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Value | Comment |
| Initial conditions | Active cell |  | Cell 1 |  |
| Neighbouring cell |  | Cell 2 |  |
| Final condition | Active cell |  | Cell 2 |  |
| Filter coefficient |  | 0 | L3 filtering is not used |
| Access Barring Information | - | Not Sent | No additional delays in random access procedure. |
| Time offset between cells |  | 3 μs | Synchronous cells |
| T1 | s | 5 |  |
| T2 | s | 8 |  |

Table G.2.1.1.3.1.2-3: Cell specific test parameters for Redirection from NR to NR test case

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Cell 1 | Cell 2 |
| T1 | T2 | T1 | T2 |
| NR RF Channel Number |  | 1 | 2 |
| BWP BW | Config 1 | MHz | DLBWP.1.1 |
| Config 2 | DLBWP.1.1 |
| DRx Cycle | ms | Not Applicable |
| PDSCH Reference measurement channel | Config 1 |  | SR.1.1 TDD |
| Config 2 | SR 2.1 TDD |
| CORESET Reference Channel | Config 1 |  | CR.1.1 TDD  |
| Config 2 | CR 2.1 TDD |
| OCNG Patterns |  | OCNG pattern 1 |
| SSB configration | Config 1 |  | SSB.1 FR1 |
| Config 2 | SSB.2 FR1 |
| SMTC configuration | Config 1 |  | SMTC.1 FR1 |
| Config 2 | SMTC.2 FR1 |
| PDSCH/PDCCH subcarrier spacing | Config 1 | kHz | 15 kHz |
| Config 2 | 30 kHz |
| PUCCH/PUSCH subcarrier spacing | Config 1 | kHz | 15 kHz |
| Config 2 | 30 kHz |
| BWP configuraiton | Initial DL BWP |  | DLBWP.0.1 |
| Dedicated DL BWP |  | DLBWP.1.1 |
| Initial UL BWP |  | ULBWP.0.1 |
| Dedicated UL BWP |  | ULBWP.1.1 |
| EPRE ratio of PSS to SSS | dB | 0 |
| EPRE ratio of PBCH DMRS to SSS |
| EPRE ratio of PBCH to PBCH DMRS |
| EPRE ratio of PDCCH DMRS to SSS |
| EPRE ratio of PDCCH to PDCCH DMRS |
| EPRE ratio of PDSCH DMRS to SSS  |
| EPRE ratio of PDSCH to PDSCH  |
| EPRE ratio of OCNG DMRS to SSS(Note 1) |
| EPRE ratio of OCNG to OCNG DMRS (Note 1) |
| Note2 | dBm/15kHz | -98 |
| Note2 | Config 1 | dBm/SCS | -98 |
| Config 2 | -95 |
|  | dB | 4 | 4 | -infinity | 4 |
|  | dB | 4 | 4 | -infinity | 4 |
| IoNote3 | Config 1 | dBm/BW | Note3 | Note3 | Note3 | Note3 |
| Config 2 | dBm/BW | Note3 | Note3 | Note3 | Note3 |
| Propagation condition | - | AWGN |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.Note 3: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.Note 4: The configuration is used as the reference to derive the test requirements. The configuration could be left for implementations and declarations. |

G.2.1.1.3.1.3 Test Requirements

The IAB-MT shall start to transmit the PRACH to Cell 2 less than 7480 ms from the beginning of time period T2.

The rate of correct RRC connection release redirection to NR observed during repeated tests shall be at least 90%.

NOTE: The redirection delay can be expressed as:

 Tconnection\_release\_redirect\_NR = TRRC\_procedure\_delay + Tidentify-NR + TSI-NR + TRACH,

where:

 TRRC\_procedure\_delay = 110 ms in the test.

 Tidentify-NR = 5440 ms in the test.

 TSI-NR = 1280 ms, it is the time required for receiving all the relevant system information.

 TRACH = 650 ms in the test.

This gives a total of 7480 ms.

Notes: The delay requirements in the test requirements are derived based on the reference configurations in Table G.2.1.1.3.1.2-1 to Table G.2.1.1.3.1.2-3. For different configuration used (i.e. TDD UL-DL pattern and related configurations), the delay requirements could be derived accordingly based on the requirements in clause 12.1.1.3.

##### G.2.1.1.3.2 Redirection from NR in FR2 to NR in FR2

G.2.1.1.3.2.1 Test Purpose and Environment

This test is to verify RRC connection release with redirection from NR to NR requirements specified in clause 12.1.1.3.

G.2.1.1.3.2.2 Test Parameters

Supported test configurations are shown in table G.2.1.1.3.2.2-1. The time delay is tested by using the parameters in table G.2.1.1.3.2.2-2, and G.2.1.1.3.2.2-3.

The test consists of two successive time periods, with time duration of T1, and T2 respectively. The *RRCRelease* message shall be sent to the IAB-MT during period T1 and the start of T2 is the instant when the last TTI containing the RRC message is sent to the UE. Prior to time duration T2, the IAB-MT shall not have any timing information of Cell 2. Cell 2 is powered up at the beginning of the T2.

Table G.2.1.1.3.2.2-1: Redirection from NR to NR test configurations

|  |  |
| --- | --- |
| **Config** | **Description** |
| 1 | Source cell: NR 120 kHz SSB SCS, TDD duplex modeTarget cell: NR 120 kHz SSB SCS, TDD duplex mode |

Table G.2.1.1.3.2.2-2: General test parameters for Redirection from NR to NR test case

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Unit** | **Value** | **Comment** |
| Initial conditions | Active cell |  | Cell 1 |  |
| Neighbouring cell |  | Cell 2 |  |
| Final condition | Active cell |  | Cell 2 |  |
| Filter coefficient |  | 0 | L3 filtering is not used |
| Access Barring Information | - | Not Sent | No additional delays in random access procedure. |
| Time offset between cells |  | 3 μs | Synchronous cells |
| T1 | s | 5 |  |
| T2 | s | 10 |  |

Table G.2.1.1.3.2.2-3: Cell specific test parameters for Redirection from NR to NR test case

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Cell 1 | Cell 2 |
| T1 | T2 | T1 | T2 |
| AoA setup |  | 1 AoA as defined in G.1.8 |
| NR RF Channel Number |  | 1 | 2 |
| Duplex mode |  | TDD |
| BWP BW | MHz | DLBWP.1.1 |
| DRx Cycle | ms | Not Applicable |
| PDSCH Reference measurement channel  |  | SR3.1 TDD |
| CORESET Reference Channel |  | CR3.1 TDD |
| OCNG Patterns |  | OCNG pattern 1 |
| SMTC configuration Note 6 |  | SMTC.1 FR2 |
| PDSCH/PDCCH subcarrier spacing | kHz | 120 kHz |
| PUCCH/PUSCH subcarrier spacing | kHz | 120 kHz |
| TRS configuration |  | TRS.2.1 TDD |
| TCI configuration Note 6 |  | CSI-RS.Config.0 |
| BWP configuraiton | Initial DL BWP |  | DLBWP.0.1 |
| Dedicated DL BWP |  | DLBWP.1.1 |
| Initial UL BWP |  | ULBWP.0.1 |
| Dedicated UL BWP |  | ULBWP.1.1 |
| EPRE ratio of PSS to SSS | dB | 0 | 0 |
| EPRE ratio of PBCH DMRS to SSS |
| EPRE ratio of PBCH to PBCH DMRS |
| EPRE ratio of PDCCH DMRS to SSS |
| EPRE ratio of PDCCH to PDCCH DMRS |
| EPRE ratio of PDSCH DMRS to SSS  |
| EPRE ratio of PDSCH to PDSCH  |
| EPRE ratio of OCNG DMRS to SSS(Note 1) |
| EPRE ratio of OCNG to OCNG DMRS (Note 1) |
| Note2 | dBm/15kHz | -104.7 | -104.7 |
| Note2 | Config 1 | dBm/SCS | -95.7 | -95.7 |
| Config 2 | -95.7 | -95.7 |
|  | dB | 5 | 5 | -Infinity | 5 |
|  | dB | 5 | 5 | -Infinity | 5 |
| IoNote3 | Config 1 | dBm/BW | Note3 | Note3 | Note3 | Note3 |
| Config 2 | dBm/BW | Note3 | Note3 | Note3 | Note3 |
| Propagation condition | - | AWGN |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.Note 3: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.Note 4: Equivalent power received by an antenna with 0 dBi gain at the centre of the quiet zoneNote 5: As observed with 0 dBi gain antenna at the centre of the quiet zoneNote 6: The configuration is used as the reference to derive the test requirements. The configuration could be left for implementations and declarations. |

G.2.1.1.3.2.3 Test Requirements

The IAB-MT shall start to transmit the PRACH to Cell 2 less than 9080 ms from the beginning of time period T2.

The rate of correct RRC connection release redirection to NR observed during repeated tests shall be at least 90%.

NOTE: The redirection delay can be expressed as:

 Tconnection\_release\_redirect\_NR = TRRC\_procedure\_delay + Tidentify-NR + TSI-NR + TRACH,

where:

 TRRC\_procedure\_delay = 110 ms in the test.

 Tidentify-NR = 7040 ms in the test.

 TSI-NR = 1280 ms, it is the time required for receiving all the relevant system information.

 TRACH = 650 ms in the test.

This gives a total of 9080 ms.

Notes: The delay requirements in the test requirements are derived based on the reference configurations in Table G.2.1.1.3.2.2-1 to Table G.2.1.1.3.2.2-3. For different configuration used (i.e. TDD UL-DL pattern and related configurations), the delay requirements could be derived accordingly based on the requirements in clause 12.1.1.3.

### <End of Change 1>