**3GPP TSG RAN Meeting #94e RP-xxxxxx**

**Electronic Meeting, Dec. 6 - 17, 2021** (revision of RP-212723)

**Source: NTT DOCOMO, INC. (Moderator)**

**Title: Draft New SI: Study on enhancement for resiliency of gNB-CU**

**Document for: Approval**

**Agenda Item: 8.6.3**

3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](http://www.3gpp.org/About/WP.htm), article 39; and [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm).
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

# Title: **Study on enhancement for resiliency of gNB-CU**

## Acronym: FS\_gNB\_resiliency

## Unique identifier: xxxx

NOTE: For new WIs/SIs leave the Unique identifier empty but you may make a proposal for an Acronym.

 If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI.

 Please tick (X) the applicable box(es) in the table below:

 Either:

|  |  |
| --- | --- |
| **This WID includes a Core part** |  |
| **This WID includes a Performance part** |  |

 or:

|  |  |
| --- | --- |
| **This WID includes a Testing part** |  |
| **and it addresses the following 3GPP work area:** | **Radio Access** |  |
| **Core Network** |  |
| **Services** |  |

## 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Affects:** | UICC apps | ME | AN | CN | Others (specify) |
| **Yes** |  | x | x |  |  |
| **No** | X |  |  |  |  |
| **Don't know** |  |  |  | X | X |

## 2 Classification of the Work Item and linked work items

### 2.1 Primary classification

|  |  |
| --- | --- |
|  | Feature |
|  | Building Block |
|  | *Work Task* |
| X | Study Item |

NOTE: Normally, Core/Perf./Testing parts in RAN WIDs are Building Blocks. Only if they are under an SA or CT umbrella, we define them as work tasks. If you are in doubt, please contact MCC.

### 2.2 Parent and child Work Items

|  |
| --- |
| Parent and child Work Items  |
| Unique ID | Title | Nature of relationship |
|  |  |  |

NOTE: RAN agreed some time ago, that it describes the feature WI + Core/Perf. part WI or Testing part WI in one WID. Therefore the table above should just include the feature WI Unique ID and title and Nature of relationship is "parent WID".

### 2.3 Other related Work Items and dependencies

|  |
| --- |
| Other related Work Items (if any) |
| Unique ID | Title | Nature of relationship |
|  |  |  |

NOTE: Classical examples: List a preceding SI or a preceding WI (e.g. if you further enhance a topic). Also related or dependent WIs in other TSGs should be indicated.

**Dependency on non-3GPP (draft) specification**:

## 3 Justification

The split NG-RAN architecture is characterised by the presence of a single logical gNB-CU-CP connected to multiple logical gNB-DUs and logical gNB-CU-UPs, for each split gNB. Failures at the gNB-CU-CP may cause interruption of UP traffic and disconnection of UEs.

For these reasons, failure scenarios and corresponding interoperable recovery solutions should be studied that allow to recover from such failures ideally without any UP interruptions or UE disconnections/interruptions at CP level. Any potential solution studied should be based on the current NG-RAN architecture.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

The study should be based on the current architecture framework for the NG-RAN (i.e. no new interfaces should be defined).

The study is to be carried out in the following three sequential phases:

* (1) Define and study failure scenarios associated with the gNB-CU-CP, and agree to study corresponding solutions for up to [5] scenarios
	+ Focus on scenarios involving an entire node failure of the gNB-CU-CP.
* (2) Identify and study solutions for recovery of failures at the gNB-CU-CP, for enhanced resiliency
* (3) Conclude the study on the feasibility of potential solutions

NOTE 1: Evaluation criteria for candidate solutions (e.g. user/control plane interruptions, signalling load towards the UE/network) should be discussed in Phase 1, and can be adjusted in Phase 2

NOTE 2: No new signalling between the UE and the network should be defined

### 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

### 4.3 RAN time budget request (not applicable to RAN5 WIs/SIs)

NOTE: For all RAN related WIs/SIs which are not led by RAN WG5 the WI/SI rapporteur has to fill out the attached Excel table to request time budgets for corresponding RAN WG meetings.
The Excel table has to be filled out for all affected RAN WGs and up to the target date of the WI/SI.
One time unit (TU) corresponds to ~ 2 hours in the meeting.
If no TU is needed leave the field empty otherwise enter a number in the field.

 For revisions of already approved WI/SI descriptions: Please remove the Excel table from the WID/SID's zip file. The time budgets are already recorded. If you want to modify them, then this has to be done via the status report and not via a revised WID/SID.

 If this WID is covering Core and Performance part, then please fill out one line for each of them in the attached Excel table.

**additional comments to the time budget request in the attached Excel table:**

## 5 Expected Output and Time scale

|  |
| --- |
| **New specifications** *{One line per specification. Create/delete lines as needed}* |
| Proposed Spec no. or series | Type (see note 1)  | Title | For info at TSG#  | For approval at TSG# | Remarks |
| 38.xxx | Internal TR | Study on enhancements for resiliency of gNB-CU | 98 | 99 |  |

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Remarks for each spec.
By default a new specs can only be new for one of both parts.

|  |
| --- |
| **Impacted existing TS/TR** *{One line per specification. Create/delete lines as needed}* |
| TS/TR No. | Description of change  | Target completion plenary# | Remarks |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Remarks for each spec.
If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 6 Work item Rapporteur(s)

Masato Taniguchi, NTT Docomo (masato.taniguchi.mf@nttdocomo.com)

## 7 Work item leadership

**Responsible RAN WG: RAN3**

## 8 Aspects that involve other WGs

NOTE: For RAN WIDs: Section 8 applies only to WGs outside of TSG RAN because RAN WG aspects have to be covered in section 4.

## 9 Supporting Individual Members

|  |
| --- |
| Supporting IM name |
| NTT DOCOMO, INC. |
| NEC |
| Verizon |
| Telecom Italia |
| SoftBank |
| Deutsche Telekom |
| Qualcomm Incorporated |
| Nokia |
| Nokia Shanghai Bell |
| KDDI |
| LG Uplus |
| Samsung |