**3GPP TSG-SA3 Meeting #116 S3-242288**

**Jeju, South Korea, 20th - 24th May 2024**

**Source: Samsung, OPPO**

**Title: New WID on security aspects of NR mobility enhancement**

**Document for: Approval**

**Agenda Item: 6**

3GPP™ Work Item Description

Information on Work Items can be found at <http://www.3gpp.org/Work-Items>
See also the [3GPP Working Procedures](http://www.3gpp.org/specifications-groups/working-procedures), article 39 and the TSG Working Methods in [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm)

Title: Security aspects of NR mobility enhancement Phase 1

Acronym: NRmobenh\_sec\_Ph1

Unique identifier:

Potential target Release: Rel-19

# 1 Impacts

{For Normative work, identify the anticipated impacts. For a Study, identify the scope of the study}

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

# 2 Classification of the Work Item and linked work items

## 2.1 Primary classification

### This work item is a …

|  |  |
| --- | --- |
|  | Study  |
|  | Normative – Stage 1 |
| X | Normative – Stage 2 |
|  | Normative – Stage 3 |
|  | Normative – Other\* |

**\* Other = e.g. testing**

## 2.2 Parent Work Item

For a brand-new topic, use “N/A” in the table below. Otherwise indicate the parent Work Item.

|  |
| --- |
| Parent Work / Study Items  |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
| NR\_Mob\_Ph4 | RAN2 | 1022091 | NR mobility enhancements Phase 4 |

### 2.3 Other related Work Items and dependencies

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

# 3 Justification

Layer1/Layer 2 Triggered Mobility (LTM) is a procedure in which a gNB receives L1 measurement report(s) from a UE, and on their basis the gNB changes UE serving cell by a cell switch command signalled via a MAC CE. The cell switch command indicates an LTM candidate configuration that the gNB previously prepared and provided to the UE through RRC signalling. Then the UE switches to the target configuration according to the cell switch command.

Currently in Rel-18, LTM operation is only supported for mobility between cells within a gNB i.e., both intra-gNB-DU and intra-gNB-CU inter-gNB-DU (same CU) mobility. In release-19, it is planned to enable it for between cells of different gNBs (inter-CU).

Further, for L3 mobility enhancement Conditional Handover (CHO) and conditional mobility procedures (CPAC, SCPAC) were developed to achieve high robustness by enabling the procedure to be executed without necessitating a signalling exchange with source cell beforehand. L3 based handover is performed over RRC and is protected using the AS security context. Whereas no security procedure is defined for protection over MAC (for L1/L2 triggered mobility).

Therefore, based on RAN2 progress on defining LTM for inter-CU in the NR mobility enhancements Phase 4 (NR\_Mob\_Ph4), it is required in SA3 needs to define the security procedure required for the re-keying needed for L1/L2 based handover.

# 4 Objective

The objective of this feature is to support the inter-CU LTM in 5G systems. This work item covers:

WT1: Security procedure to support inter-CU LTM:

- Case 1: When CU is acting as MN when DC is not configured

- Case 2: NR-DC is configured and CU is acting as SN and MCG is unchanged

- Case 3: NR-DC is configured, CU is acting as MN and SCG is unchanged or SCG is released

- Subsequent LTM mobility procedures between cell switches

NOTE 1: SA3 work depends on the work progress in RAN WGs.

NOTE 2: SA3 Work Tasks of this WID may be added/deleted/updated based on the revision to the RAN WID (NR mobility enhancements Phase 4).

## TU estimates and dependencies

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Work Task ID | TU Estimate(Study) | TU Estimate(Normative) | RAN Dependency(Yes/No/Maybe) | Inter Work Tasks Dependency |
| WT1 |  | 4 | Yes | No |

Total TU estimates for the normative phase: 4

Total TU estimates: 4

# 5 Expected Output and Time scale

|  |
| --- |
| New specifications {One line per specification. Create/delete lines as needed} |
| Type  | TS/TR number | Title | For info at TSG#  | For approval at TSG# | Rapporteur |
|  |  |  | - |  |  |
|  |  |  |  |  |  |

|  |
| --- |
| Impacted existing TS/TR {One line per specification. Create/delete lines as needed} |
| TS/TR No. | Description of change  | Target completion plenary# | Remarks |
| TS 33.501 | To support inter-CU Layer1/Layer 2 Triggered Mobility (LTM) | SA#107 (March 2025) |  |

# 6 Work item Rapporteur(s)

TBD

# 7 Work item leadership

SA3

# 8 Aspects that involve other WGs

RAN2, RAN3

# 9 Supporting Individual Members

|  |
| --- |
| Supporting IM name |
| Samsung |
| OPPO |
| Verizon |
| Huawei |
| HiSilicon |
| Ericsson |
| Intel |
| China Telecom |
| Lenovo |
| Xiaomi |
| InterDigital |
| ZTE |
| Nokia |
| Apple |
| LGE |