**3GPP TSG RAN WG2#125bis R2-240xx**

**Changsha, China, 15th - 19th April 2024**

**Title: [Draft] LS on security handling for inter-CU LTM in non-DC cases**

**Response to:**

**Release:** **Rel-19**

**Work Item: NR\_Mob\_Ph4-Core**

**Source:** **Apple [To be RAN WG2]**

**To: SA WG3**

**Cc:** **RAN WG3**

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**Attachment: None**

**1. Overall Description:**

RAN2 discussed the aspect of inter-CU LTM with key-change and views the following options as directions for handling the key change as part of inter-CU LTM cell switch:

**Option 1:** Use new information in MAC CE to deliver the security info. Whether the UE uses horizonal or vertical derivation is derived from this new information in MAC CE (not protected today).

**Option 1A:** NCC value to use is included in LTM cell switch command MAC CE during inter-CU LTM execution.

**Option 1B:** UE is preconfigured with a NCC value list and association to the index in a secured way (in RRC), and the index of NCC is included in LTM cell switch command MAC CE.

**Option 2:** Similar to Rel-18 S-CPAC key update mechanism, the UE is preconfigured from the source gNB with a NCC list **per CU**, and UE chooses the first unused NCC for the target CU upon inter-CU LTM execution. It is expected that the participating gNBs (CUs) would need to be aware of the list and how the UE applies the list.

**Option 3:** Instead of pre-provisioning to the gNBs, the participating gNBs are expected to be updated with the **next** to be used NCC after the execution of the **current** inter-CU LTM cell switch. UE and CN are aware of how the UE would use the next NCC value.

**Option 3A:** UE determines the following NCC to use by itself (eg., increase by 1) after subsequent inter-CU LTM execution.

**Option 3B:** UE is preconfigured by CN (via source gNB RRC signalling) with a NCC value list and UE chooses the first unused NCC as the next NCC value.

**Option 4:** After every inter-CU LTM cell switch execution, the UE is provided by RRC, with the NCC to be used for the next inter-gNB CU LTM switch. This implies that every inter-CU LTM switch needs a prior RRC message to inform the UE which NCC to use for this inter-CU LTM switch.

RAN2 assumes that both horizontal and vertical derivation used in L3 handover would need to be supported for inter-CU LTM.

RAN2 is aiming to avoid RRC configuration between LTM cell switches, as indicated in the WID of R19 Mob enhancement as follows,

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| --- |
| * + Specify support for subsequent LTM mobility procedures aiming to avoid RRC configuration between cell switches as per Rel-18 LTM     - Coordination with SA3 needed with respect to security key handling |

RAN2 would like to inform SA3 that RAN2 will focus first on inter-CU LTM without DC before considering the cases with DC configured. And so the above are intended for inter-CU LTM without DC case.

If Option 1 is feasible, RAN2 wonders whether, via MAC CE, the change of security algorithm or the change of key set indicator is to be supported in inter-CU LTM.

**2. Actions:**

**To RAN3**

**ACTION:** RAN2 respectfully asks RAN3 to take the above information into account and comment on the below questions:

1. RAN2 requests SA3 to inform RAN2 if any of the above options are not acceptable from security perspective (including the assessment on the impact from needed signalling between participating network nodes)
2. If Option 1 is feasible, RAN2 requests SA3 whether, via MAC CE, the change of security algorithm or the change of key set indicator is to be supported in inter-CU LTM.

**3. Date of Next RAN WG4 Meetings:**

TSG RAN WG2 Meeting #126 20 - 24 May 2024  Fukuoka, Japan

TSG RAN WG2 Meeting #127 19 - 23 Aug 2024  Maastricht, Netherlands