**3GPP TSG-SA5 Meeting #139e *S5-215067***

**October 11 – 20, 2021, e-Meeting** *s5-abcde*

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| *CR-Form-v11.4* |
| **CHANGE REQUEST** |
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|  | **28.313** | **CR** | **0035** | **rev** | **-** | **Current version:** | **17.2.0** |  |
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| *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 |  | Radio Access Network | **X** | Core Network |  |

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| ***Title:***  | Add notifications to D-SON functions of MRO and PCI re-configuration |
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| ***Source to WG:*** | Intel |
| ***Source to TSG:*** | S5 |
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| ***Work item code:*** | eSON\_5G |  | ***Date:*** | 2021-10-01 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-17 |
|  | *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-12 (Release 12)Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
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| ***Reason for change:*** | D-SON needs to provide notifications to consumers when ant SON acrions been taken. Otherwise, the consumer has no way knowing what D-SON functions have done.  |
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| ***Summary of change:*** | Add notifications to D-SON functions of MRO and PCI re-configuration |
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| ***Consequences if not approved:*** | Rel. 17 eSON\_5G WI cannot be completed. |
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| ***Clauses affected:*** | 6.1.1.2, 6.4.1.2, 7.1.2.2.3, 8.2.2, 8.2.3.3 |
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|  | **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 ... |
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| ***Other comments:*** |  |

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| **First Modified Sections** |

#### 6.1.1.2 MRO (Mobility Robustness Optimisation)

**REQ-MRO-FUN-1** The MnS producer should have a capability allowing the MnS consumer to set the targets, HO offset ranges, and control parameters for MRO function.

**REQ-MRO-FUN-2** The MnS producer should have a capability allowing the MnS consumer to collect the handover related performance measurements that are used to evaluate the MRO performance.

**REQ-MRO-FUN-3** MnS producer should have a capability allowing the MnS consumer to enable or disable the MRO function.

**REQ-MRO-FUN-4** The producer of provisioning MnS should have a capability allowing the MnS consumer to update the targets, HO offset ranges, and control information for MRO function.

**REQ-MRO-FUN-5** The producer of provisioning MnS should have a capability to notify the authorized consumer that the action haven been taken to mitigate the handover issues.

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| **Next Modified Sections** |

#### 6.4.1.2 MRO (Mobility Robustness Optimisation)

| Use case stage | Evolution/Specification | <<Uses>>Related use |
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| **Goal**  | To automatically configure the handover parameters in cells in order to improve the handover performance. |  |
| **Actors and Roles** | D-SON management function to support MRO function. |  |
| **Telecom resources** | * gNB;
* The producer of provisioning MnS
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| **Assumptions** | N/A |  |
| **Pre-conditions** | * 5G NR cells are in operation.
* MRO is in operation.
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| **Begins when**  | The D-SON management decides to enable MRO function. |  |
| **Step 1 (M)** | The D-SON management function requests the producer of provisioning MnS to set the targets, HO offset ranges, and control information for the MRO function. |  |
| **Step 2 (M)** | The D-SON management function requests the producer of provisioning MnS to enable the MRO function. |  |
| **Step 3 (M)** | The MRO function detects handover issues (e.g. too late HO, too early HO and HO to a wrong cell) in intra-RAT or inter-RAT mobility by analysing reports from UEs and network side information, and acts to mitigate the HO issues by adjusting HO related parameters. |  |
| **Step 4 (M)** | The producer of provisioning MnS notifies the D-SON management function that the MRO function has taken actions to mitigate the handover issues. |  |
| **Step 5 (M)** | The D-SON management function collects MRO related measurements, and analyses them to evaluate the MRO performance. |  |
| **Step 6 (M)** | The D-SON management function performs the following action, if the MRO performance does not meet the target: 1. Update the targets for MRO function.2. Update the ranges for MRO function.3. Update the control information for MRO function. |  |
| **Ends when**  | All the steps identified above are successfully completed. |  |
| **Exceptions** | One of the steps identified above fails. |  |
| **Post-conditions** | The MRO performance has been optimized. |  |
| **Traceability**  | **REQ-MRO-FUN-1, REQ- MR-FUN-2, REQ-MRO-FUN-3, REQ-MRO-FUN-4, REQ-MRO-FUN-5** |  |

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| **Next Modified Sections** |

##### 7.1.2.2.3 Parameters to be updated

Table 7.1.2.2.3-1: Ranges of handover parameters

| Control parameters | Definition | Legal Values |
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| Maximum deviation of Handover Trigger | This parameter defines the maximum allowed absolute deviation of the Handover Trigger, from the default point of operation (see clause 15.5.2.5 in TS 38.300 [7] and clause 9.2.2.61 in TS 38.423 [17]). See attribute maximumDeviationHoTrigger in TS 28.541 [13]. | [-20..20] in unit 0.5 dB |
| Minimum time between Handover Trigger changes | This parameter defines the minimum allowed time interval between two Handover Trigger change performed by MRO. This is used to control the stability and convergence of the algorithm (see clause 15.5.2.5 in TS 38.300 [7]). See attribute minimumTimeBetweenHoTriggerChange in TS 28.541 [13]. | [0.. 604800] in unit Seconds |
| Tstore\_UE\_cntxt | The timer used for detection of too early HO, too late HO and HO to wrong cell. Corresponds to Tstore\_UE\_cntxt timer described in clause 15.5.2.5 in TS 38.300 [7]. See attribute tstoreUEcntxt in TS 28.541 [13].  | [0..1023] in unit 100 milliseconds |

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| **Next Modified Sections** |

### 8.2.2 MRO (Mobility Robustness Optimisation)

Figure 8.2.2-1 depicts a procedure that describes how D-SON management function can manage the MRO function. It is assumed that the D-SON management function has consumed the performance assurance MnS to create PM jobs to collect handover related measurements.



Figure 8.2.2-1: MRO procedure

1. The D-SON management function consumes the provisioning MnS with *modifyMOIAttributes* operation (see clause 5.1.3 in TS 28.532 [3]) to configure targets for the MRO function.

1.a The provisioning MnS sets the targets for MRO function (NOTE).

2. The D-SON management function consumes the management service for NF provisioning with *modifyMOIAttributes* operation to configure the ranges of handover parameters.

2.a The MnS of provisioning sets the ranges for MRO function (NOTE).

3. The D-SON management function consumes the management service for NF provisioning with *modifyMOIAttributes* operation to configure the MRO control parameters (e.g. Maximum deviation of Handover Trigger, Minimum time between Handover Trigger changes).

3.a The MnS of provisioning sets the MRO control parameters for MRO function (NOTE).

4. The D-SON management function consumes the NF provisioning MnS with *modifyMOIAttributes* operation to enable the MRO function for a given NR cell if it is not enabled.

4.a The provisioning MnS enables the MRO function (NOTE).

5. The MRO function receives MRO information reports from UE(s), and analyses them to determine the actions to optimize the MRO performance. If the performance does not meet the targets, it updates the handover parameters.

6. The MRO function indicates that MRO actions have been taken (NOTE).

6.a. The MnS of provisioning sends a notification *notifyMOIAttributeValueChange* to the D-SON management function with sourceIndicator = SON\_operation\_D-MRO (see clause 11.1.1.9.2 in TS 28.532 [3]) to indicate that actions have been taken to mitigate HO issues.

7. The D-SON management function collects MRO related performance measurements.

8. The D-SON management function analyses the measurements to evaluate the MRO performance,

9. The D-SON management function performs one of the following actions, when the MRO performance does not meet the targets:

9.1. Consume the MnS of provisioning with *modifyMOIAttributes* operation to update the targets of the MRO function;

9.1.a The MnS of provisioning updates the targets for MRO function (NOTE).

92. Consume the MnS of provisioning with *modifyMOIAttributes* operation to update the ranges of the handover parameters;

9.2.a The MnS of provisioning updates the ranges of the handover parameters (NOTE).

9.3. Consume the MnS of provisioning with *modifyMOIAttributes* operation to update the control parameters;

9.3.a The MnS of provisioning updates the control parameters (NOTE).

NOTE: The interface between provisioning MnS and MRO function is not subject to standardization.

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| **Next Modified Sections** |

#### 8.2.3.3 PCI re-configuration

Figure 8.2.3.3-1 depicts a procedure that describes how the PCI configuration function, when detecting a PCI collision or confusion, re-configures the PCI of the cell based on the PCI list and notifies the D-SON management consumer.



Figure 8.2.3.3-1: PCI re-configuration procedure

1. The PCI configuration (D-SON) function detects and corrects the PCI collision or PCI confusion problem for a NR cell.

2. The PCI configuration (D-SON) function indicates the attribute change to the Producer of provisioning MnS. (NOTE)

3. The Producer of provisioning MnS sends a notification *notifyMOIAttributeValueChange* to the D-SON management function with sourceIndicator = SON\_operation\_D-PCI, attributeValueChange = new PCI value (see clause 11.1.1.9.2 in TS 28.532 [3]) to indicate the new PCI value having been assigned to NR cell.

NOTE: The interface between Producer of provisioning MnS and PCI configuration (D-SON) function is not subject to standardization.

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| **End of Modified Sections** |