**3GPP TSG-CT WG1 Meeting #130-eC1-212831r1**

**Electronic meeting, 20-28 May 2021**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **23.041** | **CR** | **0221** | **rev** | **-** | **Current version:** | **17.0.0** |  |
|  |
| *For* [***HE******LP***](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 |  | Core Network | **X** |

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|  |
| ***Title:***  | Broadcast Empty Area List for Write-Replace-Warning Request |
|  |  |
| ***Source to WG:*** | one2many |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | TEI17 |  | ***Date:*** | 2021-05-21 |
|  |  |  |  |  |
| ***Category:*** | **C** |  | ***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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | If a Write-Replace-Warning Request is delivered to an eNodeB or gNodeB and the RAN node is unable to schedule broadcast in any cell, the RAN node will repond without including the Broadcast Scheduled Area List. The CBC(F) will not be notified that scheduling the broadcast was not done, despite that delivery of the request itself to the RAN node was successful. If the CBCF was made aware that the RAN node was unable to schedule the broadcast, possibly for a temporary reason, the CBCF may delay retrying to send the Write-Replace-Warning Request again.However, if the CBC(F) receives no notification at all, the CBC(F) assumes that the Write-Replace-Warning Request has failed and the CBC(F) may retry sending the request immediately via another AMF.N.B. The solution as proposed is already specified for the Stop-Warning Request. |
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| ***Summary of change:*** | If the MME or AMF receives a response from the RAN node and the Broadcast Scheduled Area List is not included, the MME or AMF will include the eNodeB ID or gNodeB ID in the Broadcast Empty Area List. |
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| ***Consequences if not approved:*** | The CBC(F) may retry sending the request immediately because it assumes that delivery of the request to the RAN node has failed, while delivery to the RAN node has not failed; only scheduling the broadcast failed. |
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| ***Clauses affected:*** | 9.2.20, 9.2.30, 9.3.44, 9.3.60 |
|  |  |
|  | **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:*** |  |

\* \* \* First Change \* \* \* \*

### 9.2.20 WRITE-REPLACE-WARNING-INDICATION Request/Indication

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| PARAMETER | REFERENCE | PRESENCE |
| Message Type | 9.3.28 | M |
| Message Identifier | 9.3.1 | M |
| Serial-Number | 9.3.3 | M |
| Broadcast Scheduled Area List | 9.3.40 | O |
| Broadcast Scheduled Area List NG-RAN | 9.3.58 | O |
| Broadcast Empty Area List | 9.3.44 | O |
| Broadcast Empty Area List NG-RAN | 9.3.60 | O |

This Indication is sent by the MME to report to the CBC the Broadcast Scheduled Area List(s) the MME has received from the eNodeB(s) as Broadcast Completed Area List. If the MME has received a WRITE REPLACE WARNING RESPONSE without a Broadcast Completed Area List, then the eNodeB ID shall be included in the Broadcast Empty Area List instead. Multiple responses from eNodeBs may be combined in a Broadcast Scheduled Area List.

This Indication is sent by an AMF via the PWS-IWF to report to the CBC the Broadcast Scheduled Area List(s) NG-RAN the AMF has received from the NG-RAN node(s) as Broadcast Completed Area List. If the AMF has received a WRITE-REPLACE WARNING RESPONSE without a Broadcast Completed Area List, then the gNodeB ID shall be included in the Broadcast Empty Area List NG-RAN instead. Multiple responses from NG-RAN nodes may be combined by the AMF in a Broadcast Scheduled Area List NG-RAN.

If the MME or the PWS-IWF interfaces with multiple CBCs (i.e. has active SCTP associations established with multiple CBCs), the MME or PWS-IWF shall forward the same WRITE-REPLACE-WARNING-INDICATION message to all CBCs.

The *Broadcast Scheduled Area List* IE or *Broadcast Scheduled Area List NG-RAN* IE is not included in the WRITE-REPLACE WARNING INDICATION when the broadcast is unsuccessful in all the cells within the eNodeBs or NG-RAN nodes.

If the message is received from an MME then the *Broadcast Scheduled Area List* IE may be present. If the message is received from an AMF via the PWS-IWF then the *Broadscast Scheduled Area List NG-RAN* IE may be present.

The *Broadcast Empty Area List* IE may be included in the WRITE-REPLACE-WARNING-INDICATION when the MME has received at least one WRITE REPLACE WARNING RESPONSE without *Broadcast Completed Area List* IE.

The *Broadcast Empty Area List NG-RAN* IE may be included in the WRITE-REPLACE-WARNING-INDICATION when the AMF has received at least one WRITE REPLACE WARNING RESPONSE without *Broadcast Completed Area List* IE.

\* \* \* Next Change \* \* \* \*

### 9.2.30 WRITE-REPLACE-WARNING-INDICATION-NG-RAN Request/Indication

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| PARAMETER | REFERENCE | PRESENCE |
| Message Type | 9.3.28 | M |
| Message Identifier | 9.3.1 | M |
| Serial-Number | 9.3.3 | M |
| Broadcast Scheduled Area List NG-RAN | 9.3.58 | O |
| Broadcast Empty Area List NG-RAN | 9.3.60 | O |

This Indication is sent by the AMF to report to the CBCF the Broadcast Scheduled Area List(s) the AMF has received from the NG-RAN node(s) as Broadcast Completed Area List. If the AMF has received a WRITE-REPLACE WARNING RESPONSE without a Broadcast Completed Area List, then the gNodeB ID may be included in the Broadcast Empty Area List NG-RAN instead. Multiple responses from NG-RAN nodes may be combined in a Broadcast Scheduled Area List.

If the AMF interfaces with multiple CBCFs, the AMF shall forward the same WRITE-REPLACE-WARNING-INDICATION-NG-RAN message to all CBCFs.

The *Broadcast Scheduled Area List* IE is not included in the WRITE-REPLACE WARNING INDICATION-NG‑RAN when the broadcast is unsuccessful in all the cells within the NG-RAN nodes.

The *Broadcast Empty Area List NG-RAN* IE may be included in the WRITE-REPLACE-WARNING-INDICATION when the AMF has received at least one WRITE REPLACE WARNING RESPONSE without *Broadcast Completed Area List* IE.

\* \* \* Next Change \* \* \* \*

### 9.3.44 Broadcast Empty Area List

This parameter is applicable for E-UTRAN and NG-RAN only.

For E-UTRAN:

The *Broadcast Empty Area List* IE contains a list of the eNodeB IDs (see subclause 9.3.46) of eNodeBs that have responded to the the MME with a

- WRITE-REPLACE WARNING RESPONSE message in which the *Broadcast Completed Area List* IE was not included (see 3GPP TS 36.413 [34]), or

- KILL RESPONSE message in which the *Broadcast Cancelled Area List* IE was not included (see 3GPP TS 36.413 [34]).

The MME may aggregate eNodeB IDs into the Broadcast Empty Area List.

For NG-RAN:

The *Broadcast Empty Area List* IE contains a list of the RAN Node IDs (see subclause 9.3.53) of NG-RAN nodes that have responded to the the AMF with a

- WRITE-REPLACE WARNING RESPONSE message in which the *Broadcast Completed Area List* IE was not included (see 3GPP TS 38.413 [40]), or

- PWS CANCEL RESPONSE message in which the *Broadcast Cancelled Area List* IE was not included (see 3GPP TS 38.413 [40]).

The AMF may aggregate NG-RAN node IDs into the Broadcast Empty Area List.

\* \* \* Next Change \* \* \* \*

### 9.3.60 Broadcast Empty Area List NG-RAN

This parameter is applicable for NG-RAN only.

The *Broadcast Empty Area List NG-RAN* IE contains a list of the Global RAN Node IDs (see subclause 9.3.53) of NG-RAN Nodes that have responded to the the AMF with a

- WRITE-REPLACE WARNING RESPONSE message in which the *Broadcast Completed Area List* IE was not included (see 3GPP TS 38.413 [40]), or

- PWS CANCEL RESPONSE message in which the *Broadcast Cancelled Area List* IE was not included (see 3GPP TS 38.413 [40]).

The AMF may aggregate NG-RAN Node IDs into the Broadcast Empty Area List NG-RAN.

\* \* \* End of Changes \* \* \* \*