**3GPP TSG-CT WG1 Meeting #133-bis-eC1-22aaaa**

**E-meeting, 17-21 January 2022**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
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|  | **23.122** | **CR** | **0848** | **rev** | **2** | **Current version:** | **17.5.0** |  |
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| *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 | **X** | Radio Access Network |  | Core Network |  |

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| ***Title:***  |  |
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| ***Source to WG:*** | LG Electronics |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | MINT |  | ***Date:*** | 2022-01-10 |
|  |  |  |  |  |
| ***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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
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| ***Reason for change:*** | There is an Editor’s Note in clause 4.4.3.3.1, which was added in CT1#131e meeting:Editor's note: Whether the existing timer T duration can be reused if the UE has selected a PLMN offering disaster roaming service as VPLMN or a new timer duration needs to be defined is FFS.CT1 had discussed on this issue during the study phase, and the conclusion was described as “The higher priority PLMN search can be modified under the Disaster Condition” as specified in clause 8.4 of TR 24.811. In a real world case, the 2018 fire in KT network in South Korea, the disaster condition lasted from few hours to maximum 50 hours depending on the location. So in this manner, longer range of the existing ranges of timer T (2 hours to 240 hours) seems more suitable in such a scenario. It might be good if a new range (e.g. 30 min to 40 hours in 30 mins step) is introduced, but exiting range for longer search cycle seems to work.Additionally, disabling periodic search for higher priority PLMN should be considered, and from the author’s view, this should be a default behavior if there is no timer T value stored in USIM.---**Revision for CT1#133bis-e**In the CT1#133e, the two points were discussed.1. Whether to use an existing timer T or new timer (e.g. Td); and
2. If there is no timer T value stored in USIM, what should be a default behavior (e.g. disabling periodic search, or default value e.g. 1h)

For the first aspect, the author sees that introducing new timer for the same purpose (searching for higher priority PLMN) seems not a good idea. Anyway only one timer will be running at the same time, so defining two timers for exactly same purpose is not needed.**Proposal 1. Use existing timer T with different value instead of introducing new timer**For the second aspect, CT1#133e meeting agreed the way of notifying UE supporting MINT that a disaster condition no longer being applicable by deregistering UE. With this network notification, all the possible cases can be analysed as follow:If the UE stays in the area of disaster and the PLMN with DC is not recovered yet, searching for higher priority PLMN has no meaning since the UE selects the current PLMN for disaster roaming service when there is no other choice in the area. If the PLMN with DC is recovered, i.e. disaster condition is no longer applicable, the PLMN of disaster roaming can notify the UE and the UE can return to the PLMN previously with disaster condition.If the UE moves out of the area of disaster, the UE will trigger the mobility registration update and will be rejected as the disaster roaming is only allowed in the area of disaster. The UE will consequently perform the search of higher priority PLMN then.So with the default behavior of disabling PLMN search, there is no issue and it is more efficient. Of course if the UE is configured with a specific value, it will behave as a legacy UE.**Proposal 2. If there is no timer T value stored in SIM, disable the periodic search for higher priority PLMN.** |
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| ***Summary of change:*** | Described the range of timer T when the MS is registered for disaster roaming service. |
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| ***Consequences if not approved:*** | Disaster roaming MSs will use the existing range which is too short. This may result in frequent PLMN search although there is no other PLMN candidate in the area under disaster condition. |
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| ***Clauses affected:*** | 4.4.3.3.1 |
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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 ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

\*\*\*\*\* First change \*\*\*\*\*

##### 4.4.3.3.1 Automatic and manual network selection modes

If the MS is in a VPLMN, the MS shall periodically attempt to obtain service on its HPLMN (if the EHPLMN list is not present or is empty) or one of its EHPLMNs (if the EHPLMN list is present) or a higher priority PLMN/access technology combinations listed in "user controlled PLMN selector" or "operator controlled PLMN selector" by scanning in accordance with the requirements that are applicable to i), ii) and iii) as defined in the Automatic Network Selection Mode in clause 4.4.3.1.1. In the case that the mobile has a stored "Equivalent PLMNs" list the mobile shall only select a PLMN if it is of a higher priority than those of the same country as the current serving PLMN which are stored in the "Equivalent PLMNs" list. For this purpose, a value of timer T may be stored in the SIM. The interpretation of the stored value depends on the radio capabilities supported by the MS:

- For an MS that does not support any of the following: EC-GSM-IoT, Category M1 or Category NB1 (as defined in 3GPP TS 36.306 [54]), T is either in the range 6 minutes to 8 hours in 6 minute steps or it indicates that no periodic attempts shall be made. If no value for T is stored in the SIM, a default value of 60 minutes is used for T.

- For an MS that only supports any of the following or a combination of: EC-GSM-IoT, Category M1 or Category NB1 (as defined in 3GPP TS 36.306 [54]), T is either in the range 2 hours to 240 hours, using 2 hour steps from 2 hours to 80 hours and 4 hour steps from 84 hours to 240 hours, or it indicates that no periodic attempts shall be made. If no value for T is stored in the SIM, a default value of 72 hours is used.

- For an MS that supports both:

a) any of the following or a combination of: EC-GSM-IoT, Category M1 or Category NB1 (as defined in 3GPP TS 36.306 [54]); and

b) any access technology other than the following: EC-GSM-IoT, Category M1 or Category NB1 (as defined in 3GPP TS 36.306 [54]),

 then T is interpreted depending on the access technology in use as specified below:

1) if the MS is using any of the following at the time of starting timer T: EC-GSM-IoT, Category M1 or Category NB1 (as defined in 3GPP TS 36.306 [54]), T is either in the range 2 hours to 240 hours, using 2 hour steps from 2 hours to 80 hours and 4 hour steps from 84 hours to 240 hours, or it indicates that no periodic attempts shall be made. If no value for T is stored in the SIM, a default value of 72 hours is used; and

2) if the MS is not using any of the following at the time of starting timer T: EC-GSM-IoT, Category M1 or Category NB1 (as defined in 3GPP TS 36.306 [54]), T is either in the range 6 minutes to 8 hours in 6 minute steps or it indicates that no periodic attempts shall be made. If no value for T is stored in the SIM, a default value of 60 minutes is used for T.

If the MS is registered for disaster roaming service, timer T is either in the range 30 minutes to 40 hours in 30 minute steps, or it indicates that no periodic attempts shall be made. If no value for T is stored in the SIM, a default value of 2 hours is used.

If the MS is configured with the MinimumPeriodicSearchTimer as specified in 3GPP TS 24.368 [50] or 3GPP TS 31.102 [40], the MS shall not use a value for T that is less than the MinimumPeriodicSearchTimer. If the value stored in the SIM, or the default value for T (when no value is stored in the SIM), is less than the MinimumPeriodicSearchTimer, then T shall be set to the MinimumPeriodicSearchTimer.

The MS does not stop timer T, as described in 3GPP TS 24.008 [23] and 3GPP TS 24.301 [23A], when it activates power saving mode (PSM) (see 3GPP TS 23.682 [27A]) or mobile initiated connection only mode (MICO) as described in 3GPP TS 24.501 [64].

The MS can be configured for Fast First Higher Priority PLMN search as specified in 3GPP TS 31.102 [40] or 3GPP TS 24.368 [50]. Fast First Higher Priority PLMN search is enabled if the corresponding configuration parameter is present and set to enabled. Otherwise, Fast First Higher Priority PLMN search is disabled.

The attempts to access the HPLMN or an EHPLMN or higher priority PLMN shall be as specified below:

a) The periodic attempts shall only be performed in automatic mode when the MS is roaming, and not while the MS is attached for emergency bearer services, is registered for emergency services, has a PDU session for emergency services or has a PDN connection for emergency bearer services;

b) The MS shall make the first attempt after a period of at least 2 minutes and at most T minutes:

- only after switch on if Fast First Higher Priority PLMN search is disabled; or

- after switch on or upon selecting a VPLMN if Fast First Higher Priority PLMN search is enabled.

c) The MS shall make the following attempts if the MS is on the VPLMN at time T after the last attempt;

d) Periodic attempts shall only be performed by the MS while in idle mode or 5GMM-CONNECTED mode with RRC inactive indication (see 3GPP TS 24.501 [64]);

d1) Periodic attempts may be postponed while the MS is in power saving mode (PSM) (see 3GPP TS 23.682 [27A]).

d2) Periodic attempts may be postponed while the MS is receiving eMBMS transport service in idle mode (see 3GPP TS 23.246 [68]).

d3) Periodic attempts may be postponed till the next eDRX occasion while the MS is configured with eDRX.

d4) Periodic attempts may be postponed while the MS is in relaxed monitoring (see 3GPP TS 36.304 [43]).

d5) Periodic attempts may be postponed while the MS is in Mobile Initiated Connection Only mode (MICO).

e) If the HPLMN (if the EHPLMN list is not present or is empty) or a EHPLMN (if the list is present) or a higher priority PLMN is not found, the MS shall remain on the VPLMN.

f) In steps i), ii) and iii) of clause 4.4.3.1.1 the MS shall limit its attempts to access higher priority PLMN/access technology combinations to PLMN/access technology combinations of the same country as the current serving VPLMN, as defined in Annex B.

g) Only the priority levels of Equivalent PLMNs of the same country as the current serving VPLMN, as defined in Annex B, and which are not in the list of "PLMNs where registration was aborted due to SOR" if the UE has a list of "PLMNs where registration was aborted due to SOR" shall be taken into account to compare with the priority level of a selected PLMN.

h) If the PLMN of the highest priority PLMN/access technology combination available is the current VPLMN, or one of the PLMNs in the "Equivalent PLMNs" list and is not in the list of "PLMNs where registration was aborted due to SOR" if the UE has a list of "PLMNs where registration was aborted due to SOR", the MS shall remain on the current PLMN/access technology combination.

i) In step iii) of clause 4.4.3.1.1 the MS shall consider PLMNs which are in the list of "PLMNs where registration was aborted due to SOR" as lowest priority, if the UE has a list of "PLMNs where registration was aborted due to SOR".

NOTE: As an MS implementation option, the MS can make an attempt when the timer TD, TE, TF, TG or TH expires and there is a PLMN/access technology combination which the MS could not select while the timer was running (e.g. the PLMN was in the list of PLMNs where voice service was not possible in E-UTRAN) that is higher priority than the current serving PLMN and belongs to the same country as the current serving PLMN, as defined in Annex B.

\*\*\*\*\* End change \*\*\*\*\*