**3GPP TSG-CT WG1 Meeting #124-eC1-203404**

**Electronic meeting, 2-10 June 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **24.301** | **CR** | **3399** | **rev** | **-** | **Current version:** | **16.4.0** |  |
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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:*** | Disable CIOT and PSM when transferring an emergency PDU session using stand-alone PDN connectivity request | | | | | | | | | |
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| ***Source to WG:*** | BlackBerry UK Ltd. | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
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| ***Work item code:*** | 5GProtoc16 | | | | |  | ***Date:*** | | | 2020-05-26 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *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 can be 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:*** | | An ongoing emergency session may be transferred from 5GS to EPS in a network that supports continuity without N26 or by a dual registered UE.  When a UE is able to transfer the emergency session to EPS, power saving mode and CIoT EPS optimizations should not be applied. | | | | | | | | |
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| ***Summary of change:*** | | Power saving mode and CIoT EPS optimizations shall not be requested when the UE has an ongoing emergency session with 5GS and the UE is able to transfer the emergency session. | | | | | | | | |
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| ***Consequences if not approved:*** | | Emergency call failure | | | | | | | | |
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| ***Clauses affected:*** | | 5.3.11, 5.3.15 | | | | | | | | |
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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 \*\*\*

### 5.3.11 Power saving mode

The UE can request the use of power saving mode (PSM) during an attach or tracking area updating procedure (see 3GPP TS 23.682 [11A] and 3GPP TS 23.401 [10]). The UE shall not request the use of PSM during:

- an attach for emergency bearer services procedure;

- an attach procedure with attach type not set to "EPS emergency attach" and:

a) for initiating a PDN connection for emergency bearer services; or

b) when the UE has an emergency PDU session and the UE is able to transfer the emergency PDU session to the PLMN with which it is attaching or performing the tracking area update;

- a tracking area updating procedure for initiating a PDN connection for emergency bearer services;

- a tracking area updating procedure when the UE has a PDN connection established for emergency bearer services; or

- an attach for access to RLOS.

The network accepts the use of PSM by providing a specific value for timer T3324 when accepting the attach or tracking area updating procedure. The UE may use PSM only if the network has provided the T3324 value IE during the last attach or tracking area updating procedure with a value different from "deactivated".

NOTE: Timer T3324 is specified in 3GPP TS 24.008 [13].

Upon expiry of the timer T3324 or if the T3324 value provided by the network is zero, the UE may deactivate the AS layer and activate PSM by entering the state EMM-REGISTERED.NO-CELL-AVAILABLE if:

a) the UE is not attached for emergency bearer services;

b) the UE has no PDN connection for emergency bearer services;

c) the UE is in EMM-IDLE mode;

d) in the EMM-REGISTERED.NORMAL-SERVICE state; and

e) the UE is not attached for RLOS services.

If conditions a, b, c and e are fulfilled, but the UE is in a state other than EMM-REGISTERED.NORMAL-SERVICE when timer T3324 expires, the UE may activate PSM when the MS returns to state EMM-REGISTERED.NORMAL-SERVICE.

A UE that has already been allocated timer T3324 with a value different from "deactivated" and the timer T3324 has expired, may activate PSM if it receives an "Extended wait time" from lower layers.

When PSM is activated all NAS timers are stopped and associated procedures aborted except for T3412, T3346, T3396, any backoff timers, and the timer T controlling the periodic search for HPLMN or EHPLMN or higher prioritized PLMNs (see 3GPP TS 23.122 [6]).

If the UE is attached for emergency bearer services or has a PDN connection for emergency bearer services, the UE shall not activate PSM.

If the UE is attached for RLOS services, the UE shall not activate PSM.

The UE may deactivate PSM and activate the AS layerat any time. Upon deactivating PSM, the UE may initiate EMM procedures (e.g. for the transfer of mobile originated signalling or user data).

\*\*\* Next change \*\*\*

### 5.3.15 CIoT EPS optimizations

CIoT EPS optimizations provide improved support of small data and SMS transfer. A UE supporting CIoT EPS optimizations can indicate the CIoT network behaviour the UE can support and prefers to use during attach or tracking area updating procedure (see 3GPP TS 23.401 [10]). The UE may indicate the support for control plane CIoT EPS optimization, user plane CIoT EPS optimization, EMM-REGISTERED without PDN connection, S1-U data transfer and header compression (see subclause 9.9.3.34). The UE may also request to use SMS transfer without combined attach procedure during the attach procedure. Furthermore, the UE may, separately from the indication of support, indicate preference for control plane CIoT EPS optimization or user plane CIoT EPS optimization (see subclause 9.9.3.0B). The indication of preference is also considered as the request to use. A UE supporting CIoT 5GS optimizations can also indicate the 5GS CIoT network behaviour the UE can support during attach or tracking area updating procedure. Furthermore, the UE may, separately from the indication of support, indicate preference for control plane CIoT 5GS optimization or user plane CIoT 5GS optimization.

NOTE 1: The UE supporting control plane CIoT EPS optimization and S1-U data transfer but not user plane CIoT EPS optimization does not indicate preference for user plane CIoT EPS optimization.

The UE can be in NB-S1 mode or WB-S1 mode when requesting the use of CIoT EPS optimizations during an attach or tracking area updating procedure. A UE in NB-S1 mode always indicates support for control plane CIoT EPS optimization. A UE in NB-S1 mode can also request SMS transfer without combined procedure by using the normal attach or tracking area updating procedure (see subclause 5.5.1 and 5.5.3).

In NB-S1 mode, the UE, when requesting the use of CIoT EPS optimization, does not:

- request an attach for emergency bearer services procedure;

- request an attach procedure with attach type not set to "EPS emergency attach" and:

a) for initiating a PDN connection for emergency bearer services; or

b) when the UE has an emergency PDU session and the UE is able to transfer the emergency PDU session to the PLMN with which it is attaching or performing the tracking area update;

- indicate voice domain preference and UE's usage setting; or

- request an attach for access to RLOS.

The network does not indicate to the UE support of emergency bearer services when the UE is in NB-S1 mode (see subclause 5.5.1.2.4 and 5.5.3.2.4).

The control plane CIoT EPS optimization enables support of efficient transport of user data (IP, non-IP, Ethernet) or SMS messages over control plane via the MME without triggering data radio bearer establishment. The support of control plane CIoT EPS optimization is mandatory for the network in NB-S1 mode and optional in WB-S1 mode. Optional header compression of IP data can be applied to IP PDN type PDN connections that are configured to support header compression.

The user plane CIoT EPS optimization enables support for change from EMM-IDLE mode to EMM-CONNECTED mode without the need for using the service request procedure (see subclause 5.3.1.3).

If the UE indicates support of EMM-REGISTERED without PDN connection in the attach request, the UE may include an ESM DUMMY MESSAGE instead of a PDN CONNECTIVITY REQUEST message as part of the attach procedure. If the EMM-REGISTERED without PDN connection is supported by the network, the UE and the network can at any time release all the PDN connections and the UE still remains EPS attached.

NOTE 2: For both the UE and the network, the term "EMM-REGISTERED without PDN connection" is equivalent to the term "EPS attach without PDN connectivity" as specified in 3GPP TS 23.401 [10].

In NB-S1 mode, if the UE indicates "SMS only" during a normal attach or tracking area updating procedure, the MME supporting CIoT EPS optimisations provides SMS so that the UE is not required to perform a combined attach or tracking area updating procedure.

If the UE supports user plane CIoT EPS optimization, it shall also support S1-U data transfer.

If the UE indicates support of one or more CIoT EPS optimizations and the network supports one or more CIoT EPS optimizations and decides to accept the attach or tracking area update request, the network indicates the supported CIoT EPS optimizations to the UE per TAI list when accepting the UE request. Network indication of support is interpreted by the UE as the acceptance to use the respective feature. After completion of the attach or tracking area updating procedure, the UE and the network can then use the accepted CIoT EPS optimizations for the transfer of user data (IP, non-IP, Ethernet and SMS).

The UE supporting control plane CIoT EPS optimization may indicate support for control plane MT-EDT during the attach or tracking area updating procedure. For a UE that supports control plane MT-EDT and for which the network has accepted the use of control plane CIoT EPS optimization, the network may trigger the delivery of downlink data to the UE, when available, using procedures for control plane MT-EDT as specified in 3GPP TS 23.401 [10].

The UE supporting user plane CIoT EPS optimization may indicate support for user plane MT-EDT during the attach or tracking area updating procedure. For a UE that supports user plane MT-EDT and for which the network has accepted the use of user plane CIoT EPS optimization, the network may trigger the delivery of downlink data to the UE, when available, using procedures for user plane MT-EDT as specified in 3GPP TS 23.401 [10].

If the UE and the network support both the control plane CIoT EPS optimization and S1-U data transfer, then when receiving the UE's request for a PDN connection, the MME decides whether the PDN connection should be SCEF PDN connection or SGi PDN connection as specified in 3GPP TS 23.401 [10]:

- if SCEF PDN connection is to be established for non-IP data type, the MME shall include Control plane only indication for the requested PDN connection;

- if SGi PDN connection is to be established and existing SGi PDN connections for this UE were established with Control plane only indication, the MME shall include Control plane only indication for the newly requested SGi PDN connection;

- if SGi PDN connection is to be established and existing SGi PDN connections for this UE were established without Control plane only indication, the MME shall not include Control plane only indication for the newly requested SGi PDN connection; and

- if SGi PDN connection is to be established and no SGi PDN connection for this UE exists, the MME determine whether to include Control plane only indication for the requested SGi PDN connection based on local policies, the UE's preferred CIoT network behaviour and the supported CIoT network behaviour.

If the network supports user plane CIoT EPS optimization, it shall also support S1-U data transfer.

Broadcast system information may provide information about support of CIoT EPS optimizations (see 3GPP TS 36.331 [22]). At reception of new broadcast system information, the lower layers deliver it to the EMM layer in the UE. The information provided by lower layers is per PLMN and used by the UE to determine whether certain CIoT EPS optimizations are supported in the cell.

The UE shall not attempt to use CIoT EPS optimizations which are indicated as not supported.

In NB-S1 mode, when the UE requests the lower layer to establish a RRC connection and the UE requests the use of EMM-REGISTERED without PDN connection or user plane CIoT EPS optimization, the UE shall pass an indication of the requested CIoT EPS optimizations to the lower layers. If the UE requests the use of S1-U data transfer without user plane CIoT optimization, then the UE shall also pass an indication of user plane CIoT EPS optimization to lower layers.

In WB-S1 mode, when the UE requests the lower layer to establish a RRC connection and the UE requests the use of EMM-REGISTERED without PDN connection, control plane CIoT EPS optimization or user plane CIoT EPS optimization, the UE shall pass an indication of the requested CIoT EPS optimizations to the lower layers.

\*\*\* No more changes \*\*\*