**3GPP TSG-CT WG1 Meeting #134-eC1-22xxxx**

**E-meeting, 17-25 February 2022**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
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|  | **24.301** | **CR** | **3722** | **rev** | **1** | **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:***  | Clarification on SM\_RetryAtRATChange values configured in both ME and USIM |
|  |  |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | TEI17 |  | ***Date:*** | 2022-02-21 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***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:*** | It is not clear which SM\_RetryAtRATChange value has a priority if they are configured ME and USIM. |
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| ***Summary of change:*** | It is clarified that it is up to UE implementation. |
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| ***Consequences if not approved:*** | The problem identified above remains. |
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| ***Clauses affected:*** | 6.5.1.4.3, 6.5.3.4.3, 6.5.4.4.3 |
|  |  |
|  | **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:*** |  |

##### 6.5.1.4.3 Handling of network rejection due to ESM cause other than ESM cause #26

If the ESM cause value is different from #26 "insufficient resources", #28 "unknown PDN type", #50 "PDN type IPv4 only allowed", #51 "PDN type IPv6 only allowed", #54 "PDN connection does not exist", #57 "PDN type IPv4v6 only allowed", #58 "PDN type non IP only allowed", #61 "PDN type Ethernet only allowed", #65 "maximum number of EPS bearers reached", and #66 "requested APN not supported in current RAT and PLMN combination", and the Back-off timer value IE is included, the UE shall behave as follows:

1) if the PDN CONNECTIVITY REQUEST message was sent standalone, the UE shall take different actions depending on the timer value received in the Back-off timer value IE (if the UE is a UE configured to use AC11 – 15 in selected PLMN, exceptions are specified in clause 6.3.6):

i) if the timer value indicates neither zero nor deactivated, the UE shall start the back-off timer with the value provided in the Back-off timer value IE for the PDN connectivity procedure and PLMN and APN combination and

- shall not send another PDN CONNECTIVITY REQUEST message in the PLMN for the same APN that was sent by the UE, until the back-off timer expires, the UE is switched off or the USIM is removed; and

- shall not send another PDN CONNECTIVITY REQUEST message in the PLMN without an APN and with request type different from "emergency" and from "handover of emergency bearer services" if no APN was included in the PDN CONNECTIVITY REQUEST message, until the back-off timer expires, the UE is switched off or the USIM is removed;

ii) if the timer value indicates that this timer is deactivated, the UE:

- shall not send another PDN CONNECTIVITY REQUEST message in the PLMN for the same APN until the UE is switched off or the USIM is removed; and

- shall not send another PDN CONNECTIVITY REQUEST message in the PLMN without an APN and with request type different from "emergency" and from "handover of emergency bearer services" if no APN was included in the PDN CONNECTIVITY REQUEST message, until the UE is switched off or the USIM is removed; and

iii) if the timer value indicates zero, the UE:

- may send another PDN CONNECTIVITY REQUEST message in the PLMN for the same APN; and

- may send another PDN CONNECTIVITY REQUEST message in the PLMN without an APN; and

2) if the PDN CONNECTIVITY REQUEST message was sent together with an ATTACH REQUEST, the UE shall take different actions depending on the timer value received in the Back-off timer value IE and on the integrity protection of the ATTACH REJECT message (if the UE is a UE configured to use AC11 – 15 in selected PLMN, exceptions are specified in clause 6.3.6):

i) if the ATTACH REJECT message is not integrity protected, the UE shall start the back-off timer with a random value from a default range specified in table 11.2.3(see 3GPP TS 24.008 [13]), and:

a) shall not initiate a new attach procedure or send another PDN CONNECTIVITY REQUEST message in the PLMN with the same APN that was sent by the UE, until the back-off timer expires, the UE is switched off or the USIM is removed; and

b) shall not initiate a new attach procedure or send another PDN CONNECTIVITY REQUEST message in the PLMN without an APN and with request type different from "emergency" and from "handover of emergency bearer services", if the UE did not provide any APN during the attach procedure and the request type was different from "emergency", until the back-off timer expires, the UE is switched off or the USIM is removed; and

ii) if the ATTACH REJECT message is integrity protected, the UE shall proceed as follows:

a) if the timer value indicates neither zero nor deactivated, the UE shall start the back-off timer with the value provided in the Back-off timer value IE for the PDN connectivity procedure and PLMN and APN combination and:

- shall not initiate a new attach procedure or send another PDN CONNECTIVITY REQUEST message in the PLMN with the same APN that was sent by the UE, until the back-off timer expires, the UE is switched off or the USIM is removed; and

- shall not initiate a new attach procedure or send another PDN CONNECTIVITY REQUEST message in the PLMN without an APN and with request type different from "emergency" and from "handover of emergency bearer services", if the UE did not provide any APN during the attach procedure and the request type was different from "emergency" and from "handover of emergency bearer services", until the back-off timer expires, the UE is switched off or the USIM is removed;

b) if the timer value indicates that this timer is deactivated, the UE:

- shall not initiate a new attach procedure or send another PDN CONNECTIVITY REQUEST message in the PLMN with the same APN that was sent by the UE, until the UE is switched off or the USIM is removed; and

- shall not initiate a new attach procedure or send another PDN CONNECTIVITY REQUEST message in the PLMN without an APN and with request type different from "emergency" and from "handover of emergency bearer services", if the UE did not provide any APN during the attach procedure and the request type was different from "emergency" and from "handover of emergency bearer services", until the UE is switched off or the USIM is removed; and

c) if the timer value indicates that this timer is zero, the UE shall proceed as specified in clause 5.5.1.2.6 item d.

If the Back-off timer value IE is not included and the PDN CONNECTIVITY REQUEST was sent standalone, then the UE shall ignore the Re-attempt indicator IE provided by the network in PDN CONNECTIVITY REJECT, if any.

1) Additionally, if the ESM cause value is #8 "operator determined barring", #27 "missing or unknown APN", #32 "service option not supported", or #33 "requested service option not subscribed", the UE shall proceed as follows:

- if the UE is registered in the HPLMN or in a PLMN that is within the EHPLMN list (if the EHPLMN list is present), the UE shall behave as described above in the present clause, using the configured SM\_RetryWaitTime value as specified in 3GPP TS 24.368 [15A] or in USIM file NASCONFIG as specified in 3GPP TS 31.102 [17], if available, as back-off timer value; and

NOTE 0: The way to choose one of the configured SM\_RetryWaitTime values for back-off timer value is up to UE implementation if the UE is configured with:
- an SM\_RetryWaitTime value in ME as specified in 3GPP TS 24.368 [15A]; and
- an SM\_RetryWaitTime value in USIM file NASCONFIG as specified in 3GPP TS 31.102 [17].

- otherwise, if the UE is not registered in its HPLMN or in a PLMN that is within the EHPLMN list (if the EHPLMN list is present), or if the SM\_RetryWaitTime value is not configured, the UE shall behave as described above in the present clause, using the default value of 12 minutes for the back-off timer.

2) For ESM cause values different from #8 "operator determined barring", #27 "missing or unknown APN", #32 "service option not supported", or #33 "requested service option not subscribed", the UE behaviour regarding the start of a back-off timer is unspecified.

The UE shall not stop any back-off timer upon a PLMN change or inter-system change. If the network indicates that a back-off timer for the PDN connectivity procedure and PLMN and APN combination is deactivated, then it remains deactivated upon a PLMN change or inter-system change.

NOTE 1: This means the back-off timer can still be running or be deactivated for the given ESM procedure and PLMN and APN combination when the UE returns to the PLMN or when it performs inter-system change back from A/Gb or Iu mode or N1 mode to S1 mode. Thus the UE can still be prevented from sending another PDN CONNECTIVITY REQUEST message in the PLMN for the same APN.

If the Back-off timer value IE is not included and the PDN CONNECTIVITY REQUEST was sent together with an ATTACH REQUEST, the UE shall ignore the Re-attempt indicator IE provided by the network in PDN CONNECTIVITY REJECT, if any, and proceed as specified in clause 5.5.1.2.6, item d.

If the back-off timer is started upon receipt of a PDN CONNECTIVITY REJECT (i.e. the timer value was provided by the network, a configured value is available or the default value is used as explained above) or the back-off timer is deactivated, the UE behaves as follows:

1) after a PLMN change the UE may send a PDN CONNECTIVITY REQUEST message for the same APN in the new PLMN, if the back-off timer is not running and is not deactivated for the PDN connectivity procedure and the combination of new PLMN and APN;

 Furthermore as an implementation option, for the ESM cause values #8 "operator determined barring", #27 "missing or unknown APN", #32 "service option not supported" or #33 "requested service option not subscribed", if the network does not include a Re-attempt indicator IE, the UE may decide not to automatically send another PDN CONNECTIVITY REQUEST message for the same APN that was sent by the UE using the same PDN type, or the UE may decide not to automatically send another PDN CONNECTIVITY REQUEST message included in an ATTACH REQUEST message without an APN using the same PDN type if the UE did not provide any APN in the PDN connectivity procedure, if the UE is registered to a new PLMN which is in the list of equivalent PLMNs.

2) if the network does not include the Re-attempt indicator IE to indicate whether re-attempt in A/Gb or Iu mode or N1 mode is allowed, or the UE ignores the Re-attempt indicator IE, e.g. because the Back-off timer value IE is not included, then:

- if the UE is registered in its HPLMN or in a PLMN that is within the EHPLMN list (if the EHPLMN list is present), the UE shall apply the configured SM\_RetryAtRATChange value as specified in 3GPP TS 24.368 [15A] or in USIM file NASCONFIG as specified in 3GPP TS 31.102 [17], if available, to determine whether the UE may attempt a PDP context activation procedure for the same PLMN and APN combination in A/Gb or Iu mode or a PDU session establishment procedure for the same PLMN and APN combination in N1 mode; and

NOTE 1a: The way to choose one of the configured SM\_RetryAtRATChange values for back-off timer value is up to UE implementation if the UE is configured with:
- an SM\_RetryAtRATChange value in ME as specified in 3GPP TS 24.368 [15A]; and
- an SM\_RetryAtRATChange value in USIM file NASCONFIG as specified in 3GPP TS 31.102 [17].

- if the UE is not registered in its HPLMN or in a PLMN that is within the EHPLMN list (if the EHPLMN list is present), or if the NAS configuration MO as specified in 3GPP TS 24.368 [15A] is not available and the value for inter-system change is not configured in the USIM file NASCONFIG, then the UE behaviour regarding a PDP context activation procedure for the same PLMN and APN combination in A/Gb or Iu mode and a PDU session establishment procedure for the same PLMN and APN combination in N1 mode are unspecified; and

3) if the network includes the Re-attempt indicator IE indicating that re-attempt in an equivalent PLMN is not allowed, then depending on the timer value received in the Back-off timer value IE, for each combination of a PLMN from the equivalent PLMN list and the APN the UE shall start a back-off timer for the PDN connectivity procedure with the value provided by the network, or deactivate the respective back-off timer as follows:

- if the Re-attempt indicator IE additionally indicates that re-attempt in A/Gb or Iu mode or N1 mode is allowed, the UE shall start or deactivate the back-off timer for S1 mode only; and

- otherwise the UE shall start or deactivate the back-off timer for A/Gb, Iu, S1 and N1 mode.

If the back-off timer for a PLMN and APN combination was started or deactivated in A/Gb or Iu mode upon receipt of an ACTIVATE PDP CONTEXT REJECT message (see 3GPP TS 24.008 [13]) and the network indicated that re-attempt in S1 mode is allowed, then this back-off timer does not prevent the UE from sending a PDN CONNECTIVITY REQUEST message in this PLMN for the same APN after inter-system change to S1 mode. If the network indicated that re-attempt in S1 mode is not allowed, the UE shall not send any PDN CONNECTIVITY REQUEST message in this PLMN for the same APN after inter-system change to S1 mode until the timer expires, the UE is switched off or the USIM is removed.

If a back-off timer for a PLMN and APN combination, in combination with any S-NSSAI or without S-NSSAI (see 3GPP TS 24.501 [54]) was started or deactivated in N1 mode upon receipt of a PDU SESSION ESTABLISHMENT REJECT message (see 3GPP TS 24.501 [54]) and the network indicated that re-attempt in S1 mode is allowed, then this back-off timer does not prevent the UE from sending a PDN CONNECTIVITY REQUEST message in this PLMN for the same APN after inter-system change to S1 mode. If the network indicated that re-attempt in S1 mode is not allowed, the UE shall not send any PDN CONNECTIVITY REQUEST message in this PLMN for the same APN after inter-system change to S1 mode until the timer expires, the UE is switched off or the USIM is removed. If more than one back-off timers for the same PLMN and APN combination was started in N1 mode with an indication from the network that re-attempt in S1 mode is not allowed and no back-off timer for the same PLMN and APN combination was deactivated in N1 mode, the UE shall not send any PDN CONNECTIVITY REQUEST message in this PLMN for the same APN after inter-system change to S1 mode until all timers have expired. If at least one back-off timer for the same PLMN and APN combination was deactivated in N1 mode, the UE shall not send any PDN CONNECTIVITY REQUEST message in this PLMN for the same APN until the UE is switched off or the USIM is removed.

NOTE 2: The back-off timer is used to describe a logical model of the required UE behaviour. This model does not imply any specific implementation, e.g. as a timer or timestamp.

NOTE 3: Reference to back-off timer in this section can either refer to use of timer T3396 or to use of a different packet system specific timer within the UE. Whether the UE uses T3396 as a back-off timer or it uses different packet system specific timers as back-off timers is left up to UE implementation. This back-off timer is stopped when the UE is switched off or the USIM is removed.

When the back-off timer is running or the timer is deactivated, the UE is allowed to initiate an attach procedure or PDN connectivity procedure if the procedure is for emergency bearer services.

If the ESM cause value is #28 "unknown PDN type" and the PDN CONNECTIVITY REQUEST message contained a PDN type IE indicating a PDN connection type, the UE shall ignore the Back-off timer value IE and Re-attempt indicator IE provided by the network, if any. The UE may send another PDN CONNECTIVITY REQUEST message with the PDN type IE indicating another PDN connection type.

If the ESM cause value is #50 "PDN type IPv4 only allowed", #51 "PDN type IPv6 only allowed", #57 "PDN type IPv4v6 only allowed", #58 "PDN type non IP only allowed" or #61 "PDN type Ethernet only allowed", the UE shall ignore the Back-off timer value IE provided by the network, if any. The UE shall not automatically send another PDN CONNECTIVITY REQUEST message for the same APN that was sent by the UE to obtain a PDN type different from the one allowed by the network until any of the following conditions is fulfilled:

- the UE is registered to a new PLMN, and either the network did not include a Re-attempt indicator IE in the PDN CONNECTIVITY REJECT message or the Re-attempt indicator IE included in the message indicated that re-attempt in an equivalent PLMN is allowed;

- the UE is registered to a new PLMN which was not in the list of equivalent PLMNs at the time when the PDN CONNECTIVITY REJECT message was received;

- the UE is switched off; or

- the USIM is removed.

For the ESM cause values #50 "PDN type IPv4 only allowed", #51 "PDN type IPv6 only allowed", #57 "PDN type IPv4v6 only allowed", #58 "PDN type non IP only allowed" and #61 "PDN type Ethernet only allowed", the UE shall ignore the value of the RATC bit in the Re-attempt indicator IE provided by the network, if any.

NOTE 4: For the ESM cause values #50 "PDN type IPv4 only allowed", #51 "PDN type IPv6 only allowed", #57 "PDN type IPv4v6 only allowed", #58 "PDN type non IP only allowed" and #61 "PDN type Ethernet only allowed", re-attempt in A/Gb, Iu, or N1 mode for the same APN (or no APN, if no APN was indicated by the UE) is only allowed using the PDN type(s) indicated by the network.

Furthermore as an implementation option, for the SM cause values #50 "PDN type IPv4 only allowed", #51 "PDN type IPv6 only allowed", #57 "PDN type IPv4v6 only allowed", #58 "PDN type non IP only allowed" and #61 "PDN type Ethernet only allowed", if the network does not include a Re-attempt indicator IE the UE may decide not to automatically send another PDN CONNECTIVITY REQUEST message for the same APN that was sent by the UE using the same PDN type, if the UE is registered to a new PLMN which is in the list of equivalent PLMNs.

NOTE 5: Request to send another PDN CONNECTIVITY REQUEST message with a specific PDN type has to come from upper layers.

If the ESM cause value is #65 "maximum number of EPS bearers reached", the UE shall determine the PLMN's maximum number of EPS bearer contexts in S1 mode (see clause 6.5.0) as the number of active EPS bearer contexts it has. The UE shall ignore the Back-off timer value IE and Re-attempt indicator IE provided by the network, if any.

NOTE 6: In some situations, when attempting to establish multiple EPS bearer contexts, the number of active EPS bearer contexts that the UE has when ESM cause #65 is received is not equal to the maximum number of EPS bearer contexts reached in the network.

NOTE 7: When the network supports emergency bearer services, it is not expected that ESM cause #65 is returned by the network when the UE requests a PDN connection for emergency bearer services.

The PLMN's maximum number of EPS bearer contexts in S1 mode applies to the PLMN in which the ESM cause #65 "maximum number of EPS bearers reached" is received. When the UE is switched off, when the USIM is removed, or when there is a change in the value indicated by the network in the 15 bearers bit of the EPS network feature support IE, the UE shall clear all previous determinations representing PLMNs maximum number of EPS bearer contexts in S1 mode. Upon successful registration with a new PLMN, the UE may clear previous determinations representing any PLMN's maximum number(s) of EPS bearer contexts in S1 mode.

If the ESM cause value is #66 "requested APN not supported in current RAT and PLMN combination", the UE shall take different actions depending on the Back-off timer value IE and the Re-attempt indicator IE optionally included:

1) If the PDN CONNECTIVITY REQUEST message was sent standalone, the Back-off timer value IE is not included, and either the Re-attempt indicator IE is not included or the Re-attempt indicator IE is included indicating that re-attempt in an equivalent PLMN is allowed, the UE shall not send another PDN CONNECTIVITY REQUEST message for the same APN in the current PLMN in S1 mode until the UE is switched off or the USIM is removed;

2) if the PDN CONNECTIVITY REQUEST message was sent standalone, the Back-off timer value IE is not included, and the Re-attempt indicator IE is included and indicates that re-attempt in an equivalent PLMN is not allowed, the UE shall not send a PDN CONNECTIVITY REQUEST message for the same APN in any PLMN in the list of equivalent PLMNs in S1 mode until the UE is switched off or the USIM is removed;

3) if the PDN CONNECTIVITY REQUEST message was sent standalone and the Back-off timer value IE is included, the UE shall take different actions depending on the timer value received in the Back-off timer value IE (if the UE is a UE configured to use AC11 – 15 in selected PLMN, exceptions are specified in clause 6.3.6):

i) if the timer value indicates neither zero nor deactivated, the UE shall start the back-off timer with the value provided in the Back-off timer value IE for the PLMN and APN combination and shall not send another PDN CONNECTIVITY REQUEST for the same APN in the current PLMN in S1 mode until the back-off timer expires, the UE is switched off or the USIM is removed;

ii) if the timer value indicates that this timer is deactivated, the UE shall not send another PDN CONNECTIVITY REQUEST message for the same APN in the current PLMN in S1 mode until the UE is switched off or the USIM is removed; and

iii) if the timer value indicates that this timer is zero, the UE may send a PDN CONNECTIVITY REQUEST message for the same APN in the current PLMN; and

4) if the PDN CONNECTIVITY REQUEST message was sent together with an ATTACH REQUEST, the UE shall take different actions depending on the integrity protection of the ATTACH REJECT message (if the UE is a UE configured to use AC11 – 15 in selected PLMN, exceptions are specified in clause 6.3.6):

i) if the ATTACH REJECT message is not integrity protected, regardless whether the Back-off timer IE is included, the UE shall start the back-off timer with a random value from a default range specified in table 11.2.3(see 3GPP TS 24.008 [13]), and shall not initiate a new attach procedure or send another PDN CONNECTIVITY REQUEST message in the current PLMN in S1 mode with the same APN that was sent by the UE, until the back-off timer expires, the UE is switched off or the USIM is removed; and

ii) if the ATTACH REJECT message is integrity protected, the UE shall proceed as follows:

a) if the Back-off timer value IE is included and the timer value indicates neither zero nor deactivated, the UE shall start the back-off timer with the value provided in the Back-off timer value IE for the PDN connectivity procedure and PLMN and APN combination and shall not initiate a new attach procedure or send another PDN CONNECTIVITY REQUEST message in the current PLMN in S1 mode with the same APN that was sent by the UE, until the back-off timer expires, the UE is switched off or the USIM is removed;

b) if the Back-off timer value IE is included and the timer value indicates that this timer is deactivated, the UE shall not initiate a new attach procedure or send another PDN CONNECTIVITY REQUEST message in the current PLMN in S1 mode with the same APN that was sent by the UE, until the UE is switched off or the USIM is removed;

c) if the Back-off timer value IE is included and the timer value indicates that this timer is zero, the UE shall proceed as specified in clause 5.5.1.2.6 item d;

d) if the Back-off timer value IE is not included, and either the Re-attempt indicator IE is not included or the Re-attempt indicator IE is included indicating that re-attempt in an equivalent PLMN is allowed, the UE shall not initiate a new attach procedure or send another PDN CONNECTIVITY REQUEST message for the same APN in the current PLMN in S1 mode until the UE is switched off or the USIM is removed; and

e) if the Back-off timer value IE is not included, and the Re-attempt indicator IE is included and indicates that re-attempt in an equivalent PLMN is not allowed, the UE shall not initiate a new attach procedure or send a PDN CONNECTIVITY REQUEST message for the same APN in any PLMN in the list of equivalent PLMNs in S1 mode until the UE is switched off or the USIM is removed.

NOTE 8: Receiving ESM cause value #66 during an attach procedure without APN is not expected and the UE behaviour is implementation specific.

If the network includes the Re-attempt indicator IE indicating that re-attempt in an equivalent PLMN is not allowed, then

- for cases 3.i, 4.i and 4.ii.a the UE shall additionally start a back-off timer with the value provided in the Back-off timer value IE for the PDN connectivity procedure for each combination of a PLMN from the equivalent PLMN list and the APN; and

- for cases 3.ii and 4.ii.b the UE shall deactivate the respective back-off timers for the PDN connectivity procedure for each combination of a PLMN from the equivalent PLMN list and the APN.

For the ESM cause value #66 "requested APN not supported in current RAT and PLMN combination" the UE shall ignore the value of the RATC bit in the Re-attempt indicator IE provided by the network, if any.

As an implementation option, for cases 1, 3.i, 3.ii, 4.iv, 4.v.a and 4.v.b, if the Re-attempt indicator IE is not included, the UE may decide not to automatically send another PDN CONNECTIVITY REQUEST message for the same APN in a PLMN which is in the list of equivalent PLMNs.

If the ESM cause value is #54 "PDN connection does not exist", the UE shall ignore the Back-off timer value IE and Re-attempt indicator IE provided by the network, if any, and take different actions as follows:

- if the PDN CONNECTIVITY REQUEST message was sent standalone, the UE shall set the request type to "initial request" in the subsequent PDN CONNECTIVITY REQUEST message to establish a PDN connectivity to the same APN;

- if the PDN CONNECTIVITY REQUEST message was sent together with an ATTACH REQUEST message, the UE shall set the request type to "initial request" in the PDN CONNECTIVITY REQUEST message which is included in the subsequent ATTACH REQUEST message to establish a PDN connectivity to the same APN.

NOTE 9: User interaction is necessary in some cases when the UE cannot re-activate the EPS bearer context(s) automatically.

If the PDN connection is for UAS services, and the PDN CONNECTIVITY REJECT message includes the extended protocol configuration options IE containing the service-level-AA container with the length of two octets containing the service-level-AA response parameter indicating "Service level authentication and authorization was not successful", then the UE supporting UAS services shall consider the UUAA procedure as failed and not attempt to establish a PDN connection for UAS services.

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

##### 6.5.3.4.3 Handling of network rejection due to ESM cause other than ESM cause #26

If the ESM cause value is different from #26 "insufficient resources" and #65 "maximum number of EPS bearers reached", and the Back-off timer value IE is included, the UE shall behave as follows depending on the timer value received in the Back-off timer value IE (if the UE is a UE configured to use AC11 – 15 in selected PLMN, exceptions are specified in clause 6.3.6):

- if the timer value indicates neither zero nor deactivated, the UE shall start the back-off timer with the value provided in the Back-off timer value IE for the bearer resource allocation procedure and PLMN and APN combination and not send another BEARER RESOURCE ALLOCATION REQUEST message in the PLMN for the same APN until the back-off timer expires, the UE is switched off or the USIM is removed;

- if the timer value indicates that this timer is deactivated, the UE shall not send another BEARER RESOURCE ALLOCATION REQUEST message in the PLMN for the same APN until the UE is switched off or the USIM is removed; and

- if the timer value indicates zero, the UE may send another BEARER RESOURCE ALLOCATION REQUEST message in the PLMN for the same APN.

If the Back-off timer value IE is not included, then the UE shall ignore the Re-attempt Indicator IE provided by the network, if any.

1) Additionally, if the ESM cause value is #32 "service option not supported", or #33 "requested service option not subscribed", the UE shall proceed as follows:

- if the UE is registered in the HPLMN or in a PLMN that is within the EHPLMN list (if the EHPLMN list is present), the UE shall behave as described above in the present clause, using the configured SM\_RetryWaitTime value as specified in 3GPP TS 24.368 [15A] or in USIM file NASCONFIG as specified in 3GPP TS 31.102 [17], if available, as back-off timer value; and

NOTE 0: The way to choose one of the configured SM\_RetryWaitTime values for back-off timer value is up to UE implementation if the UE is configured with:
- an SM\_RetryWaitTime value in ME as specified in 3GPP TS 24.368 [15A]; and
- an SM\_RetryWaitTime value in USIM file NASCONFIG as specified in 3GPP TS 31.102 [17].

- otherwise, if the UE is not registered in its HPLMN or a PLMN that is within the EHPLMN list (if the EHPLMN list is present) or the SM\_RetryWaitTime value is not configured, the UE shall behave as described above in the present clause, using the default value of 12 minutes for the back-off timer.

2) For ESM cause values different from #32 "service option not supported", or #33 "requested service option not subscribed", the UE behaviour regarding the start of a back-off timer is unspecified.

The UE shall not stop any back-off timer upon a PLMN change or inter-system change. If the network indicates that a back-off timer for the bearer resource allocation procedure and PLMN and APN combination is deactivated, then it remains deactivated upon a PLMN change or inter-system change.

NOTE 1: This means the back-off timer can still be running or be deactivated for the given ESM procedure and PLMN and APN combination when the UE returns to the PLMN or when it performs inter-system change back from A/Gb or Iu mode or N1 mode to S1 mode. Thus the UE can still be prevented from sending another BEARER RESOURCE ALLOCATION REQUEST message in the PLMN for the same APN.

If the back-off timer is started upon receipt of BEARER RESOURCE ALLOCATION REJECT (i.e. the timer value was provided by the network, a configured value is available or the default value is used as explained above) or the back-off timer is deactivated, the UE behaves as follows:

1) after a PLMN change the UE may send a BEARER RESOURCE ALLOCATION REQUEST message for the same APN in the new PLMN, if the back-off timer is not running and is not deactivated for the bearer resource allocation procedure and the combination of new PLMN and APN;

 Furthermore as an implementation option, for the ESM cause values #32 "service option not supported" or #33 "requested service option not subscribed", if the network does not include a Re-attempt indicator IE, the UE may decide not to automatically send another BEARER RESOURCE ALLOCATION REQUEST message for the same APN that was sent by the UE, if the UE is registered to a new PLMN which is in the list of equivalent PLMNs.

2) if the network does not include the Re-attempt indicator IE to indicate whether re-attempt in A/Gb or Iu mode or N1 mode is allowed, or the UE ignores the Re-attempt indicator IE, e.g. because the Back-off timer value IE is not included, then:

- if the UE is registered in its HPLMN or in a PLMN that is within the EHPLMN list (if the EHPLMN list is present), the UE shall apply the configured SM\_RetryAtRATChange value as specified in 3GPP TS 24.368 [15A] or in USIM file NASCONFIG as specified in 3GPP TS 31.102 [17], if available, to determine whether the UE may attempt a secondary PDP context activation procedure for the same PLMN and APN combination in A/Gb or Iu mode or a PDU session modification procedure for the same PLMN and APN combination in N1 mode; and

NOTE 1a: The way to choose one of the configured SM\_RetryAtRATChange values for back-off timer value is up to UE implementation if the UE is configured with:
- an SM\_RetryAtRATChange value in ME as specified in 3GPP TS 24.368 [15A]; and
- an SM\_RetryAtRATChange value in USIM file NASCONFIG as specified in 3GPP TS 31.102 [17].

- if the UE is not registered in its HPLMN or in a PLMN that is within the EHPLMN list (if the EHPLMN list is present), or if the NAS configuration MO as specified in 3GPP TS 24.368 [15A] is not available and the value for inter-system change is not configured in the USIM file NASCONFIG, then the UE behaviour regarding a secondary PDP context activation procedure for the same PLMN and APN combination in A/Gb or Iu mode and a PDU session modification procedure for the same PLMN and APN combination in N1 mode are unspecified; and

3) if the network includes the Re-attempt indicator IE indicating that re-attempt in an equivalent PLMN is not allowed, then depending on the timer value received in the Back-off timer value IE, for each combination of a PLMN from the equivalent PLMN list and the APN the UE shall start a back-off timer for the bearer resource allocation procedure with the value provided by the network, or deactivate the respective back-off timer as follows:

- if the Re-attempt indicator IE additionally indicates that re-attempt in A/Gb or Iu mode or N1 mode is allowed, the UE shall start or deactivate the back-off timer for S1 mode only; and

- otherwise the UE shall start or deactivate the back-off timer for A/Gb, Iu, S1 and N1 mode.

If the back-off timer for a PLMN and APN combination was started or deactivated in A/Gb or Iu mode upon receipt of an ACTIVATE SECONDARY PDP CONTEXT REJECT message (see 3GPP TS 24.008 [13]) and the network indicated that re-attempt in S1 mode is allowed, then this back-off timer does not prevent the UE from sending a BEARER RESOURCE ALLOCATION REQUEST message in this PLMN for the same APN after inter-system change to S1 mode. If the network indicated that re-attempt in S1 mode is not allowed, the UE shall not send any BEARER RESOURCE ALLOCATION REQUEST message in this PLMN for the same APN after inter-system change to S1 mode until the timer expires, the UE is switched off or the USIM is removed.

If a back-off timer for a PLMN and APN combination, in combination with any S-NSSAI or without S-NSSAI (see 3GPP TS 24.501 [54]) was started or deactivated in N1 mode upon receipt of a PDU SESSION MODIFICATION REJECT message (see 3GPP TS 24.501 [54]) and the network indicated that re-attempt in S1 mode is allowed, then this back-off timer does not prevent the UE from sending a BEARER RESOURCE ALLOCATION REQUEST message in this PLMN for the same APN after inter-system change to S1 mode. If the network indicated that re-attempt in S1 mode is not allowed, the UE shall not send any BEARER RESOURCE ALLOCATION REQUEST message in this PLMN for the same APN after inter-system change to S1 mode until the timer expires, the UE is switched off or the USIM is removed. If more than one back-off timer for the same PLMN and APN combination was started in N1 mode with an indication from the network that re-attempt in S1 mode is not allowed and no back-off timer for the same PLMN and APN combination was deactivated in N1 mode, the UE shall not send any BEARER RESOURCE ALLOCATION REQUEST message in this PLMN for the same APN after inter-system change to S1 mode until all timers have expired. If at least one back-off timer for the same PLMN and APN combination was deactivated in N1 mode, the UE shall not send any BEARER RESOURCE ALLOCATION REQUEST message in this PLMN for the same APN until the UE is switched off or the USIM is removed.

NOTE 2: The back-off timer is used to describe a logical model of the required UE behaviour. This model does not imply any specific implementation, e.g. as a timer or timestamp.

NOTE 3: Reference to back-off timer in this section can either refer to use of timer T3396 or to use of a different packet system specific timer within the UE. Whether the UE uses T3396 as a back-off timer or it uses different packet system specific timers as back-off timers is left up to UE implementation. This back-off timer is stopped when the UE is switched off or the USIM is removed.

If the ESM cause value is #65 "maximum number of EPS bearers reached", the UE shall determine the PLMN's maximum number of EPS bearer contexts in S1 mode (see clause 6.5.0) as the number of active EPS bearer contexts it has. The UE shall ignore the Back-off timer value IE and Re-attempt indicator IE provided by the network, if any.

NOTE 5: In some situations, when attempting to establish multiple EPS bearer contexts, the number of active EPS bearer contexts in the UE when cause #65 is received is not equal to the maximum number of EPS bearer contexts reached in the network.

The PLMN's maximum number of EPS bearer contexts in S1 mode applies to the PLMN in which the ESM cause #65 "maximum number of EPS bearers reached" is received. When the UE is switched off or when the USIM is removed, the UE shall clear all previous determinations representing any PLMN's maximum number of EPS bearer contexts in S1 mode. Upon successful registration with a new PLMN, the UE may clear previous determinations representing any PLMN's maximum number of EPS bearer contexts in S1 mode.

The further actions to be performed by the UE are implementation dependent as part of upper layers responsibility.

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

##### 6.5.4.4.3 Handling of network rejection due to ESM cause other than ESM cause #26

If the ESM cause value is not #26 "insufficient resources", and the Back-off timer value IE is included, the UE shall behave as follows depending on the timer value received in the Back-off timer value IE (if the UE is a UE configured to use AC11 – 15 in selected PLMN, exceptions are specified in clause 6.3.6):

- if the timer value indicates neither zero nor deactivated, the UE shall start the back-off timer with the value provided in the Back-off timer value IE for the bearer resource modification procedure and PLMN and APN combination and not send another BEARER RESOURCE MODIFICATION REQUEST message with exception of those identified in clause 6.5.4.1, in the PLMN for the same APN until the back-off timer expires, the UE is switched off or the USIM is removed;

- if the timer value indicates that this timer is deactivated, the UE shall not send another BEARER RESOURCE MODIFICATION REQUEST message with exception of those identified in clause 6.5.4.1, in the PLMN for the same APN until the UE is switched off or the USIM is removed; and

- if the timer value indicates zero, the UE may send another BEARER RESOURCE MODIFICATION REQUEST message in the PLMN for the same APN.

If the Back-off timer value IE is not included, then the UE shall ignore the Re-attempt indicator IE provided by the network, if any.

1) Additionally, if the ESM cause value is #32 "service option not supported", or #33 "requested service option not subscribed", the UE shall proceed as follows:

- if the UE is registered in the HPLMN or in a PLMN that is within the EHPLMN list (if the EHPLMN list is present), the UE shall behave as described above in the present clause, using the configured SM\_RetryWaitTime value as specified in 3GPP TS 24.368 [15A] or in USIM file NASCONFIG as specified in 3GPP TS 31.102 [17], if available, as back-off timer value; and

NOTE 0: The way to choose one of the configured SM\_RetryWaitTime values for back-off timer value is up to UE implementation if the UE is configured with:
- an SM\_RetryWaitTime value in ME as specified in 3GPP TS 24.368 [15A]; and
- an SM\_RetryWaitTime value in USIM file NASCONFIG as specified in 3GPP TS 31.102 [17].

- otherwise, if the UE is not registered in its HPLMN or a PLMN that is within the EHPLMN list (if the EHPLMN list is present) or the SM\_RetryWaitTime value is not configured, the UE shall behave as described above in the present clause, using the default value of 12 minutes for the back-off timer.

2) For ESM cause values different from #32 "service option not supported", or #33 "requested service option not subscribed", the UE behaviour regarding the start of a back-off timer is unspecified.

The UE shall not stop any back-off timer upon a PLMN change or inter-system change. If the network indicates that a back-off timer for the bearer resource modification procedure and PLMN and APN combination is deactivated, then it remains deactivated upon a PLMN change or inter-system change.

NOTE 1: This means the back-off timer can still be running or be deactivated for the given ESM procedure and PLMN and APN combination when the UE returns to the PLMN or when it performs inter-system change back from A/Gb or Iu mode or N1 mode to S1 mode. Thus the UE can still be prevented from sending another BEARER RESOURCE MODIFICATION REQUEST message with exception of those identified in clause 6.5.4.1, in the PLMN for the same APN.

If the back-off timer is started upon receipt of BEARER RESOURCE MODIFICATION REJECT (i.e. the timer value was provided by the network, a configured value is available or the default value is used as explained above) or the back-off timer is deactivated, the UE behaves as follows:

1) after a PLMN change the UE may send a BEARER RESOURCE MODIFICATION REQUEST message for the same APN in the new PLMN, if the back-off timer is not running and is not deactivated for the bearer resource modification procedure and the combination of new PLMN and APN;

 Furthermore as an implementation option, for the ESM cause values #32 "service option not supported" or #33 "requested service option not subscribed", if the network does not include a Re-attempt indicator IE, the UE may decide not to automatically send another BEARER RESOURCE MODIFICATION REQUEST message for the same APN that was sent by the UE, if the UE is registered to a new PLMN which is in the list of equivalent PLMNs.

2) if the network does not include the Re-attempt indicator IE to indicate whether re-attempt in A/Gb or Iu mode or N1 mode is allowed, or the UE ignores the Re-attempt indicator IE, e.g. because the Back-off timer value IE is not included, then:

- if the UE is registered in its HPLMN or in a PLMN that is within the EHPLMN list (if the EHPLMN list is present), the UE shall apply the configured SM\_RetryAtRATChange value as specified in 3GPP TS 24.368 [15A] or in USIM file NASCONFIG as specified in 3GPP TS 31.102 [17], if available, to determine whether the UE may attempt a PDP context modification procedure for the same PLMN and APN combination in A/Gb or Iu mode or a PDU session modification procedure for the same PLMN and APN combination in N1 mode; and

NOTE 1a: The way to choose one of the configured SM\_RetryAtRATChange values for back-off timer value is up to UE implementation if the UE is configured with:
- an SM\_RetryAtRATChange value in ME as specified in 3GPP TS 24.368 [15A]; and
- an SM\_RetryAtRATChange value in USIM file NASCONFIG as specified in 3GPP TS 31.102 [17].

- if the UE is not registered in its HPLMN or in a PLMN that is within the EHPLMN list (if the EHPLMN list is present), or if the NAS configuration MO as specified in 3GPP TS 24.368 [15A] is not available and the value for inter-system change is not configured in the USIM file NASCONFIG, then the UE behaviour regarding a PDP context modification procedure for the same PLMN and APN combination in A/Gb or Iu mode and a PDU session modification procedure for the same PLMN and APN combination in N1 mode are unspecified; and

3) if the network includes the Re-attempt indicator IE indicating that re-attempt in an equivalent PLMN is not allowed, then depending on the timer value received in the Back-off timer value IE, for each combination of a PLMN from the equivalent PLMN list and the APN the UE shall start a back-off timer for the bearer resource modification procedure with the value provided by the network, or deactivate the respective back-off timer as follows:

- if the Re-attempt indicator IE additionally indicates that re-attempt in A/Gb or Iu mode or N1 mode is allowed, the UE shall start or deactivate the back-off timer for S1 mode only; and

- otherwise the UE shall start or deactivate the back-off timer for A/Gb, Iu, S1 and N1 mode.

If the back-off timer for a PLMN and APN combination was started or deactivated upon receipt of an MODIFY PDP CONTEXT REJECT message (see 3GPP TS 24.008 [13]) and the network indicated that re-attempt in S1 mode is allowed, then this back-off timer does not prevent the UE from sending a BEARER RESOURCE MODIFICATION REQUEST message in this PLMN for the same APN after inter-system change to S1 mode. If the network indicated that re-attempt in S1 mode is not allowed, the UE shall not send any BEARER RESOURCE MODIFICATION REQUEST message in this PLMN for the same APN after inter-system change to S1 mode until the timer expires, the UE is switched off or the USIM is removed.

If a back-off timers for a PLMN and APN combination, in combination with any S-NSSAI or without S-NSSAI (see 3GPP TS 24.501 [54]) was started or deactivated in N1 mode upon receipt of a PDU SESSION MODIFICATION REJECT message (see 3GPP TS 24.501 [54]) and the network indicated that re-attempt in S1 mode is allowed, then this back-off timer does not prevent the UE from sending a BEARER RESOURCE MODIFICATION REQUEST message in this PLMN for the same APN after inter-system change to S1 mode. If the network indicated that re-attempt in S1 mode is not allowed, the UE shall not send any BEARER RESOURCE MODIFICATION REQUEST message in this PLMN for the same APN after inter-system change to S1 mode until the timer expires, the UE is switched off or the USIM is removed. If more than one back-off timer for the same PLMN and APN combination was started in N1 mode with an indication from the network that re-attempt in S1 mode is not allowed and no back-off timer for the same PLMN and APN combination was deactivated in N1 mode, the UE shall not send any BEARER RESOURCE MODIFICATION REQUEST message in this PLMN for the same APN after inter-system change to S1 mode until all timers have expired. If at least one back-off timer for the same PLMN and APN combination was deactivated in N1 mode, the UE shall not send any BEARER RESOURCE MODIFICATION REQUEST message in this PLMN for the same APN until the UE is switched off or the USIM is removed.

NOTE 2: The back-off timer is used to describe a logical model of the required UE behaviour. This model does not imply any specific implementation, e.g. as a timer or timestamp.

NOTE 3: Reference to back-off timer in this section can either refer to use of timer T3396 or to use of a different packet system specific timer within the UE. Whether the UE uses T3396 as a back-off timer or it uses different packet system specific timers as back-off timers is left up to UE implementation. This back-off timer is stopped when the UE is switched off or the USIM is removed.

The further actions to be performed by the UE are implementation dependent as part of upper layers responsibility.