**3GPP TSG-RAN WG3 Meeting #123 *R3-240992***

**Athens, GR, 26 Feb – 01 Mar, 2024**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.423** | **CR** | **1153** | **rev** | **1** | **Current version:** | **16.16.0** |  |
|  | | | | | | | | |
| *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 | **X** | Core Network |  |

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| ***Title:*** | Correction of IP-Sec Transport Layer Address | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, China Telecom, China Unicom | | | | | | | | | |
| ***Source to TSG:*** | R3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_newRAT-Core, TEI16 | | | | |  | ***Date:*** | | | 2024-02-19 |
|  |  | | | |  | |  | | |  |
| ***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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The *TNL Configuration Info* IE is used to indicate the IP addresses of IPSEc endpoints used for establishment of IPSec tunnels, where the *IP-Sec Transport Layer Address* IE is **mandatory** for the *Extended UP Transport Layer Addresses To Add Item* IE while is **optional** for the *Extended UP Transport Layer Addresses To Remove Item* IE. But in the ASN.1, the *Extended UP Transport Layer Addresses To Add Item* IE and the *Extended UP Transport Layer Addresses To Remove Item* IE are referring to the same encoding, where the iPsecTLA is **optional**.  In fact, the *IP-Sec Transport Layer Address* IE should be always indicated, when the *TNL Configuration Info* IE is included. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | To be backward compatible, add procedure texts in the abnormal conditions when the receiving node receives the *TNL Configuration Info* IE, but the *IP-Sec Transport Layer Address* IE is not included.  Impact Analysis:  Impact assessment towards the previous version of the specification (same release):  This CR has isolated impact with the previous version of the specification (same release) because it clarifies that the *IP-Sec Transport Layer Address* IE should be mandatory within the *TNL Configuration Info* IE.  The impact can be considered isolated because the change affects IPSec TNL establishment. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Potental failure case when the IPSec tunnel can not be successfully established.  The tabular and ASN.1 are not aligned. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 9.4.1.4, 8.4.2.4, 9.2.3.96 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | | Rev0: R3-240305  Rev1: R3-240992  Revert the changes, and add abnormal conditions. | | | | | | | | |

*CHANGES START*

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## 8.4 Global procedures

### 8.4.1 Xn Setup

#### 8.4.1.1 General

The purpose of the Xn Setup procedure is to exchange application level configuration data needed for two NG-RAN nodes to interoperate correctly over the Xn-C interface.

NOTE 1: If Xn-C signalling transport is shared among multiple Xn-C interface instances, one Xn Setup procedure is issued per Xn-C interface instance to be setup, i.e. several Xn Setup procedures may be issued via the same TNL association after that TNL association has become operational.

NOTE 2: Exchange of application level configuration data also applies between two NG-RAN nodes in case the SN (i.e. the gNB) does not broadcast system information other than for radio frame timing and SFN, as specified in the TS 37.340 [8]. How to use this information when this option is used is not explicitly specified.

The procedure uses non UE-associated signalling.

#### 8.4.1.2 Successful Operation



Figure 8.4.1.2: Xn Setup, successful operation

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If the *TNL Configuration Info* IE is contained in the XN SETUP REQUEST message, the NG-RAN node2 shall, if supported, take this IE into account for IPSec establishment.

If the *TNL Configuration Info* IE is contained in the XN SETUP RESPONSE message, the NG-RAN node1 shall, if supported, take this IE into account for IPSec establishment.

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#### 8.4.1.4 Abnormal Conditions

If the first message received for a specific TNL association is not an XN SETUP REQUEST, XN SETUP RESPONSE, or XN SETUP FAILURE message then this shall be treated as a logical error.

If the initiating NG-RAN node1 does not receive either XN SETUP RESPONSE message or XN SETUP FAILURE message, the NG-RAN node1 may reinitiate the Xn Setup procedure towards the same NG-RAN node, provided that the content of the new XN SETUP REQUEST message is identical to the content of the previously unacknowledged XN SETUP REQUEST message.

If the initiating NG-RAN node1 receives an XN SETUP REQUEST message from the peer entity on the same Xn interface:

- In case the NG-RAN node1 answers with an XN SETUP RESPONSE message and receives a subsequent Xn SETUP FAILURE message, the NG-RAN node1 shall consider the Xn interface as non operational and the procedure as unsuccessfully terminated according to sub clause 8.4.1.3.

- In case the NG-RAN node1 answers with an XN SETUP FAILURE message and receives a subsequent XN SETUP RESPONSE message, the NG-RAN node1 shall ignore the XN SETUP RESPONSE message and consider the Xn interface as non operational.

If the *TNL Configuration Info* IE is contained in the XN SETUP REQUEST or the XN SETUP RESPONSE message, but the *IP-Sec Transport Layer Address* IE is not included either in the *Extended UP Transport Layer Addresses To Add Item* IE or the *Extended UP Transport Layer Addresses To Remove Item* IE, the receiving NG-RAN node shall consider it as a logical error.

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### 8.4.2 NG-RAN node Configuration Update

#### 8.4.2.1 General

The purpose of the NG-RAN node Configuration Update procedure is to update application level configuration data needed for two NG-RAN nodes to interoperate correctly over the Xn-C interface.

NOTE: Update of application level configuration data also applies between two NG-RAN nodes in case the SN (i.e. the gNB) does not broadcast system information other than for radio frame timing and SFN, as specified in the TS 37.340 [8]. How to use this information when this option is used is not explicitly specified.

The procedure uses non UE-associated signalling.

#### 8.4.2.2 Successful Operation



Figure 8.4.2.2-1: NG-RAN node Configuration Update, successful operation

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If case of network sharing with multiple cell ID broadcast with shared Xn-C signalling transport, as specified in TS 38.300 [9], the NG-RAN NODE CONFIGURATION UPDATE message and the NG-RAN NODE CONFIGURATION UPDATE ACKNOWLEDGE message shall include the *Interface Instance Indication* IE to identify the corresponding interface instance.

If the *TNL Configuration Info* IE is contained in the NG-RAN NODE CONFIGURATION UPDATE message, the NG-RAN node2 shall take this IE into account for IPSec establishment.

If the *TNL Configuration Info* IE is contained in the NG-RAN NODE CONFIGURATION UPDATE ACKNOWLEDGE message, the NG-RAN node1 shall take this IE into account for IPSec establishment.

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#### 8.4.2.4 Abnormal Conditions

If the NG-RAN node1 after initiating NG-RAN node Configuration Update procedure receives neither NG-RAN NODE CONFIGURATION UPDATE ACKNOWLEDGE message nor NG-RAN NODE CONFIGURATION UPDATE FAILURE message, the NG-RAN node1 may reinitiate the NG-RAN node Configuration Update procedure towards the same NG-RAN node2, provided that the content of the new NG-RAN NODE CONFIGURATION UPDATE message is identical to the content of the previously unacknowledged NG-RAN NODE CONFIGURATION UPDATE message.

If the *TNL Configuration Info* IE is contained in the NG-RAN NODE CONFIGURATION UPDATE message or the NG-RAN NODE CONFIGURATION UPDATE ACKNOWLEDGE message, but the *IP-Sec Transport Layer Address* IE is not included either in the *Extended UP Transport Layer Addresses To Add Item* IE or the *Extended UP Transport Layer Addresses To Remove Item* IE, the receiving NG-RAN node shall consider it as a logical error.

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#### 9.2.3.96 TNL Configuration Info

This IE is used for signalling IP addresses of IPSEc endpoints used for establishment of IPSec tunnels.

| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| --- | --- | --- | --- | --- |
| **Extended UP Transport Layer Addresses To Add List** |  | *0..1* |  |  |
| **>Extended UP Transport Layer Addresses To Add Item** |  | *1..<maxnoofExtTLAs>* |  |  |
| >>IP-Sec Transport Layer Address | O |  | Transport Layer Address  9.2.3.29 | Transport Layer Addresses for IP-Sec endpoint. |
| **>>GTP Transport Layer Addresses To Add List** |  | *0..1* |  |  |
| **>>>GTP Transport Layer Addresses To Add Item** |  | *1..<maxnoofGTPTLAs>* |  |  |
| >>>>GTP Transport Layer Address Info | M |  | Transport Layer Address  9.3.2.29 | GTP Transport Layer Addresses for GTP end-points. |
| **Extended UP Transport Layer Addresses To Remove List** |  | *0..1* |  |  |
| **>Extended UP Transport Layer Addresses To Remove Item** |  | *0..<maxnoofExtTLAs>* |  |  |
| >>IP-Sec Transport Layer Address | O |  | Transport Layer Address  9.2.3.29 | Transport Layer Addresses for IP-Sec endpoint. |
| **>>GTP Transport Layer Addresses To Remove List** |  | *0..1* |  |  |
| **>>>GTP Transport Layer Addresses To Remove Item** |  | *1..<maxnoofGTPTLAs>* |  |  |
| >>>>GTP Transport Layer Address Info | M |  | Transport Layer Address  9.2.3.2 | GTP Transport Layer Addresses for GTP end-points. |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofExtTLAs | Maximum no. of Extended Transport Layer Addresses in the message. Value is 16. |
| maxnoofGTPTLAs | Maximum no. of GTP Transport Layer Addresses for a GTP end-point in the message. Value is 16. |

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### 9.3.5 Information Element definitions

-- ASN1START

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

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-- Information Element Definitions

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-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

XnAP-IEs {

itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)

ngran-access (22) modules (3) xnap (2) version1 (1) xnap-IEs (2) }

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ExtTLAs ::= SEQUENCE (SIZE(1..maxnoofExtTLAs)) OF ExtTLA-Item

ExtTLA-Item ::= SEQUENCE {

iPsecTLA TransportLayerAddress OPTIONAL,

gTPTransportLayerAddresses GTPTLAs OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {ExtTLA-Item-ExtIEs} } OPTIONAL,

...

}

ExtTLA-Item-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

...

}

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TNLConfigurationInfo ::= SEQUENCE {

extendedUPTransportLayerAddressesToAdd ExtTLAs OPTIONAL,

extendedUPTransportLayerAddressesToRemove ExtTLAs OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {TNLConfigurationInfo-ExtIEs} } OPTIONAL,

...

}

TNLConfigurationInfo-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

...

}

*CHANGES END*