**3GPP TSG-CT WG1 Meeting #127-eC1-20wxyz**

**Electronic meeting, 13-20 November 2020 (was C1-207093)**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
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|  | **24.502** | **CR** | **0174** | **rev** | **1** | **Current version:** | **16.5.0** |  |
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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 | **X** |

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| ***Title:***  | Correction to procedures for non 5G capable over WLAN (N5CW) devices |
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| ***Source to WG:*** | Huawei, HiSilicon |
| ***Source to TSG:*** | C1 |
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| ***Work item code:*** | 5WWC |  | ***Date:*** | 2020-11-17 |
|  |  |  |  |  |
| ***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 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-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)* |
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| ***Reason for change:*** | The specification was updated in Rel-16 with procedures for non 5G capable over WLAN (N5CW) devices over trusted WLAN access network.However, there are a number of inaccuracies or wrong statements. For example, the references used from TS 23.003 are not correct for the construction of the NAI which leads to wrong information. The term N5CW is not defined under the definitions clause and the current description inside the specification is not accurate. Note that there is not 5G NAS or 5G UE but a UE supporting NAS signalling with 5GCN using the N1 reference point as specified in TS 24.501. |
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| ***Summary of change:*** | (1) A term definition for non 5G capable over WLAN (N5CW) is added;(2) correct reference to TS 23.003 are added for NAI construction; and(3) several corrections to the use of the term 5G UE, 5G NAS and reference to TS 33.501. |
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| ***Consequences if not approved:*** | Inaccuracies and wrong statements on procedures for non 5G capable over WLAN (N5CW) devices remain in the specification. This can lead to wrong implementations as, for example, the references used from TS 23.003 are not correct for the construction of the NAI. Hence, wrong implementations can be developed. |
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| ***Clauses affected:*** | 3.1, 7.3A.2.2, 7.3A.4.1, 7.3A.4.2 |
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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 ...  |
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| ***Other comments:*** |  |
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| ***This CR's revision history:*** | Revision 1; the word “device” is appended to the end of the new proposed term Non 5G capable over WLAN (N5CW). Changed from “which” to “when the” for the case when for the cases when an NAI needs to be constructed for a PLMN with indication of trusted connectivity. Removal of the words “A single” for the EAP-AKA’ authentication procedure. |

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

## 3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

**Non 5G capable over WLAN (N5CW) device:** A device that is not capable to operate as a UE supporting NAS signalling with the 5GCN over a WLAN access network. However, this device may be capable to operate as a UE supporting NAS signalling with 5GCN using the N1 reference point as specified in 3GPP TS 24.501 [4] over 3GPP access (i.e. NG-RAN). An N5CW device may be allowed to access the 5GCN via trusted WLAN access network (TWAN) that supports a trusted WLAN interworking function (TWIF).

**MTU:** Maximum transmission unit (MTU) is the largest PDU size which can be transmitted and received by a network entity in one single IP packet without any need for IP fragmentation.

**NWt:** NWt is the reference point between the UE and the TNGF for establishing secure tunnel(s) between the UE and the TNGF so that control-plane and user-plane exchanged between the UE and the 5G core network is transferred securely over trusted non-3GPP access.

**NWu:** NWu is the reference point between the UE and the N3IWF for establishing secure tunnel(s) between the UE and the N3IWF so that control-plane and user-plane exchanged between the UE and the 5G core network is transferred securely over untrusted non-3GPP access.

For the purposes of the present document, the following terms and definitions given in 3GPP TS 23.501 [2] apply:

**5G Access Network**

**5G Core Network**

**5G QoS flow**

**5G QoS identifier**

**5G System**

**Network identifier (NID)**

**PDU Session**

**Stand-alone Non-Public Network**

**TNGF**

For the purposes of the present document, the following terms and definitions given in 3GPP TS 23.003 [8] apply:

**Global Line Identifier (GLI)**

**Global Cable Identifier (GCI)NAI**

For the purposes of the present document, the following terms and definitions given in 3GPP TS 33.501 [5] apply:

**SUPI**

**SUCI**

For the purposes of the present document, the following terms and definitions given in 3GPP TS 24.302 [7] apply:

**S2a connectivity**

For the purposes of the present document, the following terms and definitions given in 3GPP TS 24.501 [4] apply:

**W-AGF acting on behalf of the N5GC device**

For the purposes of the present document, the following terms and definitions given in 3GPP TS 23.316 [40] apply:

**W-CP EAP connection**

**W-CP signalling connection**

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

#### 7.3A.2.2 Identity transaction

Upon reception of EAP-Request/Identity message (as described in IETF RFC 3748 [9]), encapsulated in the link layer protocol packets from the TNAP, the UE shall:

a) construct an EAP-Response/Identity message as described in IETF RFC 3748 [9] containing an NAI as specified in subclause 28.7.6 of 3GPP TS 23.003 [8] to request a PLMN when the trusted connectivity is 5G connectivity using trusted non-3GPP access; and

b) transmit the EAP-Response of identity type encapsulated in the link layer protocol packets towards the TNAP.

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

#### 7.3A.4.1 General

A trusted non-3GPP access network (TNAN) may be implemented as a trusted WLAN access network (TWAN) which supports a WLAN access technology such as the one described in IEEE 802.11 [19]. A non 5G capable over WLAN (N5CW) device does not support NAS signalling with the 5GCN over WLAN, but may access 5GCN via a TWAN supporting a trusted WLAN interworking function (TWIF). An N5CW device may be a UE with capability for NAS signalling with the 5GCN using the N1 reference point as specified in 3GPP TS 24.501 [4] over 3GPP access although it lacks capability of NAS signalling over WLAN.

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

#### 7.3A.4.2 N5CW device registration over trusted WLAN access network

A trusted WLAN access network (TWAN) includes a trusted WLAN access point (TWAP) and a trusted WLAN interworking function (TWIF) as illustrated in figure 7.3A.4.2-1.

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Figure 7.3A.4.2-1: Trusted WLAN Access Network

The EAP-AKA' authentication procedure is executed for connecting the N5CW device to a TWAN according to 3GPP TS 33.501 [5] subclause 7A.2.4.

The TWAN and an N5CW device initiate an exchange of EAP-Request/Identity message and EAP-Response/Identity message as specified in IETF RFC 3748 [9] for link layer authentication of the UE by the TWAP. In the trusted WLAN access network, the TWAP and the N5CW device exchange EAP-Request/Identity message and EAP-Response/Identity message, encapsulated in the link layer protocol packets i.e. IEEE 802.11/802.1x packets.

Upon reception of EAP-Request/Identity message encapsulated in the IEEE 802.11/802.1x packets from the TWAP, the N5CW device shall:

a) construct an EAP-Response/Identity message as described in IETF RFC 3748 [9] containing an NAI as specified in subclause 28.7.7 of 3GPP TS 23.003 [8] to request a PLMN when the trusted connectivity is 5G connectivity without NAS using trusted non-3GPP access; and

NOTE 1: The NAI includes the 5G-GUTI assigned to the N5CW device over 3GPP access, if the N5CW device is also a UE and is already registered to the 5GCN over 3GPP access. If the N5CW device is not registered to the 5GCN over 3GPP access, the NAI includes the SUCI.

b) transmit the EAP-Response of identity type encapsulated in the link layer protocol packets towards the TWAP.

The TWAP conveys the information provided by the N5CW device to the TWIF which initiates a registration procedure followed by a PDU session establishment procedure to obtain an IP address, on behalf of the N5CW device to an AMF according to 3GPP TS 24.501 [4].

NOTE 2: The communication protocol between the TWAP and the TWIF is outside of the scope of 3GPP.

An exchange of the EAP request and EAP response as described in IETF RFC 3748 [9] occurs until the N5CW device is authenticated by the 5GCN with the EAP authentication described in 3GPP TS 33.501 [5]. Upon completion of the N5CW device authentication and reception of the EAP-Success by the N5CW device, the N5CW device and the TWAP use the TWAP key to establish access specific layer-2 security 4-way handshake according to IEEE 802.11 [19].

\* \* \* End of Change \* \* \* \*