**3GPP TSG-CT WG1 Meeting #126-eC1-206525**

**Electronic meeting, 15-23 October 2020 *was* C1-205897**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
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|  | **24.502** | **CR** | **0156** | **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 |  |

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| ***Title:***  |  |
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| ***Source to WG:*** | ZTE, Huawei, HiSilicon, Lenovo, Motorola Mobility |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | 5WWC |  | ***Date:*** | 2020-10-20 |
|  |  |  |  |  |
| ***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:*** | In clause 5, editor's notes should be resolved:1) "*Editor's note: It is FFS which sort of trusted non-3GPP access is preferred for the case when both "S2a connectivity" and "trusted 5G connectivity" are indicated.*"This can be resolved in a NOTE as TS 23.501 already defines the preferred connectivity in subclause 6.3.12.2 of TS 23.501:"If the list of available PLMNs indicates that both 'S2a connectivity' and '5G connectivity' is supported for the selected PLMN, then **the UE shall select '5G connectivity' because it is the preferred type of trusted access**."2) "*Editor's note: the rules for creating the root or decorated NAI for 5GS are yet to be specified in TS 23.003.**Editor's note: It is FFS whether the UE uses rules in clause 19 (EPC) or clause 28 (5GS) of TS 23.003 to construct a NAI.*"In TS 23.003, subclause 28.7.6 specifies how to construct the NAI used for 5G registration via trusted non-3GPP access, and subclause 28.7.7 specifies how to construct NAI used by N5CW devices via trusted non-3GPP access. In addition, TS 23.003 specifies that in case of 5GCN, there is no need for a decorated NAI as in EPC, since the UE sends a NAS registration request to the PLMN including a SUCI or 5G-GUTI.Based on above, NAI construction for the case of trusted non-3GPP access to 5GCN should refer to TS 23.003 directly, and NAI construction for the case of non-3GPP access to EPC should refer to both TS 24.302 and TS 23.003.Therefore, subclause 5.3A.4.3 is not needed. |
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| ***Summary of change:*** | Update NOTE 3 in subclause 5.3.2.3 saying If the UE selects a PLMN over WLAN included in both the PLMN List with S2a Connectivity IE, and the PLMN List with trusted 5G connectivity IE, the UE requests the PLMN with trusted 5G connectivityClarify that the UE shall construct the NAI according to:* subclause 28.7.6 of 3GPP TS 23.003 if the selected type of trusted connectivity is trusted 5G connectivity; or
* subclause 28.7.7 of 3GPP TS 23.003 if the selected type of trusted connectivity is connectivity-without-NAS.

Clarify that how the UE constructs NAI when the PLMN is selected from the PLMN list of PLMN List IE and from the PLMN list of the PLMN List with S2a Connectivity IE respectively.Void 5.3A.4.3. |
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| ***Consequences if not approved:*** | Unresolved editor's notes on NAI remain. |
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| ***Clauses affected:*** | 5.3.2.3, 5.3A.4.1, 5.3A.4.3 |
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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:*** |  |
|  |  |
| ***This CR's revision history:*** | Revision 1; merging of CRs in C1-205979, C1-205980 and C1-205982 so changes under sub-clause 5.3.2.3 and 5.3.A.4.1 are updated. |

\* \* \* 1st Change \* \* \* \*

#### 5.3.2.3 Automatic mode WLAN selection

The UE shall first determine valid WLANSP rules for WLAN selection:

a) if the UE is not roaming over 3GPP access, the UE shall use the valid WLANSP rules from the HPLMN; or

b) if the UE is roaming over 3GPP access, the UE may have valid WLANSP rules from several of the visited PLMN, a PLMN equivalent to the visited PLMN and the home PLMN. The UE uses the WLANSP rules in the following order of decreasing priority:

1) the valid WLANSP rules from the visited PLMN;

2) the valid WLANSP rules from the equivalent PLMN in which the UE last received WLANSP; and

3) the valid WLANSP rules from the home PLMN.

The UE shall then determine the selected WLAN(s) according to the following steps:

a) use the procedures specified in the IEEE 802.11 [19] to discover the available WLANs. The UE may perform ANQP procedures as specified in the IEEE 802.11 [19] or the Hotspot 2.0 [20] to discover the attributes and capabilities of available WLANs. If the UE supports ANQP procedures, the UE may send an ANQP request for lists of service providers (i.e. ANQP-elements "Domain Name", see IEEE 802.11 [19]) and PLMN identities (i.e. ANQP-element "3GPP Cellular Network", see 3GPP TS 24.302 [7] annex H); and

b) if the UE has performed ANQP procedures to discover the attributes and capabilities of available WLANs, compare the attributes and capabilities of the available WLANs with the group of selection criteria of the valid WLANSP rules and construct a prioritized list of available WLANs that fulfill the selection criteria.

1) when there are multiple valid WLANSP rules the UE evaluates the valid WLANSP rules in priority order. The UE evaluates first if an available WLAN access meets the selection criteria of the highest priority valid WLANSP rule. The UE then evaluates if an available WLAN access meets the selection criteria of the next priority valid WLANSP rule;

NOTE 1: Each WLANSP rule can include one or more groups of selection criteria in priority order. If there are multiple highest priority groups of selection criteria in the valid WLANSP rule, it is up to the UE implementation which one to use.

2) if the Home network ind bit is not set to "1" in the group of selection criteria (see 3GPP TS 24.526 [17]), the WLAN(s) that match the group of selection criteria with the highest priority are considered as the most preferred WLANs, the WLAN(s) that match the group of selection criteria with the second highest priority are considered as the second most preferred WLANs;

3) if the Home network ind bit is set to "1" in the group of selection criteria (see 3GPP TS 24.526 [17]), then the UE shall create a list of available WLANs and shall apply the group of selection criteria to all the WLANs in this list. A WLAN is included in this list, if

i) the other selection criteria in the active WLANSP rule are met; and

ii) the UE received a lists of service providers (i.e. ANQP-elements "Domain Name") and PLMN identities (i.e. ANQP-element "3GPP Cellular Network"), and:

I) if the list with PLMNs that can be selected from the WLAN (see 3GPP TS 24.302 [7]) includes:

A) the HPLMN derived from its IMSI; or

B) a PLMN matching an entry in the UE's list of equivalent PLMNs; or

II) if the domain name list (see IEEE 802.11 [19]) includes:

A) the home domain name derived from its IMSI; or

B) the domain name derived from its list of equivalent PLMNs; and

NOTE 2: If the Home network ind bit is set to "1" in a group of selection criteria then this group of selection criteria is not expected to include the preferred roaming partner list and the preferred SSID list.

NOTE 3: WLAN advertises PLMN(s) towards which the S2a connectivity or the 5G connectivity using trusted non-3GPP access is supported by using the ANQP-element "3GPP Cellular Network" with the PLMN List with S2a Connectivity IE, the PLMN List with trusted 5G connectivity IE or the PLMN List with trusted 5G connectivity-without-NAS IE in the payload (see 3GPP TS 24.302 [7] Annex H). The PLMN List with trusted 5G connectivity-without-NAS IE is only used by N5CW devices. If the UE selects a PLMN over WLAN included in both the PLMN List with S2a Connectivity IE, and the PLMN List with trusted 5G connectivity IE, the UE requests the PLMN with trusted 5G connectivity (see 3GPP TS 23.501 [2] subclause 6.3.12.2).

4) The priority of a WLAN in the available WLANs list is set to the WLAN priority defined in the preferredSSIDlist of the matching group of selection criteria. There may be one or more selected WLANs in the list.

\* \* \* 2nd Change \* \* \* \*

#### 5.3A.4.1 General

The purpose of this procedure is to:

- select a PLMN over WLAN; and

- construct a NAI for use with authentication signalling with the selected PLMN in order for the UE to be authorised to use the WLAN.

Until the highest priority PLMN is found, the UE shall verify if a PLMN available over a WLAN of the selected WLAN(s) is the highest priority PLMN:

1) using the PLMNs which are available for WLAN as described in subclause 5.3A.2, the UE uses the realms of the PLMN in the remaining steps of this subclause;

2) if the UE is registered over 3GPP access, the realm of the RPLMN of the 3GPP access is included in the list of realms created in subclause 5.3A.2 and the realm of the RPLMN of the 3GPP access does not match a realm converted from any PLMN ID in the list of "forbidden PLMNs for non-3GPP access to 5GCN", the UE shall select the RPLMN of the 3GPP access;

3) if the UE is registered over 3GPP access, the realm of the RPLMN of the 3GPP access is not included in the list of realms created in subclause 5.3A.2, the PLMN is in the "N3AN node selection information" (see 3GPP TS 24.526 [17]) and the PLMN is not in the list of "forbidden PLMNs for non-3GPP access to 5GCN" then the UE shall select the RPLMN of the 3GPP access and performs N3AN node selection with the RPLMN as defined in subclause 7.2;

4) if the condition in steps 2) and 3) are not satisfied, the UE shall select a PLMN in the following order:

i) if the UE used the procedures in IETF RFC 4284 [31] (see subclause 5.3A.2) to obtain a list of realms, then the UE is only required to select the realm of the HPLMN (if available);

ii) if the UE can determine the country it is located in (see subclause 7.2.3) and the UE determines it is located in the home country, the UE follows the procedures in subclause 5.3A.4.2;

iii) if the UE can determine the country it is located in (see subclause 7.2.3) and the UE determines it is located in a visited country, the UE determines whether it is mandatory to select a PLMN in the visited country.

Editor's note: the procedure for determining whether it is mandatory to select a PLMN in the visited country involves TS 23.003, DNS, cached DNS responses, and is FFS.

 If the UE determines that it is not mandatory to select a PLMN in the visited country, the UE shall follow the procedures in subclause 5.3A.4.2;

 If the UE determines that it is mandatory to select a PLMN in the visited country, the UE shall select, in priority order, a PLMN from the list of realms created in subclause 5.3A.2, if:

I) the PLMN is in the User Controlled PLMN Selector list (see 3GPP TS 31.102 [35]); or

II) the PLMN is in the Operator Controlled PLMN Selector list (see 3GPP TS 31.102 [35]).

 If no match is found in either of the lists, the UE may perform N3AN node selection as defined in subclause 7.2.

The UE shall construct a NAI for authentication with the highest priority PLMN as follows:

1) if the PLMN selected was selected from:

i) a list of realms obtained using IETF RFC 4284 [31]; or

ii) a list of PLMNs obtained from the PLMN List IE (see annex H of 3GPP TS 24.302 [7]), and the PLMN was neither present in the PLMN List with S2a Connectivity IE, in the PLMN List with trusted 5G Connectivity IE nor the PLMN List with trusted 5G connectivity-without-NAS IE;

 then the UE constructs a NAI as specified in subclause 5.2.3.2.3 of 3GPP TS 24.302 [7] for the case when the NAI is used for access via non-3GPP access to EPC and in accordance to the rules of 3GPP TS 23.003 [8] and the UE proceeds processing as defined in 3GPP TS 24.302 [7];

2) if the PLMN selected was selected from a list of PLMNs obtained from the PLMN List with trusted 5G Connectivity IE or the PLMN List with trusted 5G connectivity-without-NAS IE (see annex H of 3GPP TS 24.302 [7]), then the UE constructs a NAI as specified in:

i) subclause 28.7.6 of 3GPP TS 23.003 [8] if the selected type of trusted connectivity is 5G connectivity using trusted non-3GPP access; or

ii) subclause 28.7.7 of 3GPP TS 23.003 [8] if the selected type of trusted connectivity is 5G connectivity without NAS using trusted non-3GPP access; or

3) if the PLMN selected was selected from a list of PLMNs obtained from the PLMN List with S2a Connectivity IE (see annex H of 3GPP TS 24.302 [7]) for the case when the NAI is used for access via trusted non-3GPP access to EPC, then the UE constructs a NAI as specified in sucblause 5.2.3.2.3 of 3GPP TS 24.302 [7] and the UE proceeds processing as defined in 3GPP TS 24.302 [7].

NOTE 1: UE implementations can optimize the steps described above, e.g. by combining the ANQP procedures described in subclause 5.3A.2 with the ANQP procedures in subclause 5.3.2.3.

NOTE 2: Selecting a WLAN from multiple WLANs advertising support for the selected PLMN is UE implementation specific.

NOTE 3: The N5CW device which is not registered or cannot register via NG-RAN only uses the PLMN List with trusted 5G connectivity-without-NAS IE, and the PLMN List with trusted 5G connectivity-without-NAS IE is only used by the N5CW devices.

\* \* \* 3rd Change \* \* \* \*

#### 5.3A.4.3 Void

\* \* \* End of Changes \* \* \* \*