**3GPP TSG-CT WG1 Meeting #138-eC1-22XXXX**

**E-Meeting, 10th – 14th October 2022**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **24.302** | **CR** | **0731** | **rev** | **2** | **Current version:** | **17.6.0** |  |
|  | | | | | | | | |
| *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 | **X** | Radio Access Network |  | Core Network | **X** |

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|  | | | | | | | | | | |
| ***Title:*** | Connectivity for NSWO authentication | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Lenvo, Nokia, Nokia Shanghi Bell | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NSWO\_5G | | | | |  | ***Date:*** | | | 2022-10-10 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***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 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:*** | | Clause 6.3.12b in TS 23,501 defines a new list of PLMNs advertized by a discovered WLAN which can be used by the UE with the HPLMN listed in the new list of PLMNs to connect to use the 5G NSWO authentication procedure defined in TS 33.501. This new list of PLMNs is necessary as described in S2-2206732, since otherwise it would be impossible for the UE to determine for the UE whether it initiates the Authentication and Key Agreement procedure specified in TS 33.402 or the NSWO authentication procedure specified in TS 33.501.  Currecnt text in clause H.2.4.2 is too broad and covers connection by the WLAN and should be limited to AAA connectivity to EPC. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Added and identity and definition of a new information element for the list of PLMNs with AAA connectivity to a 5GC.  As the current text in clause H.2.4.2 is too broad and covers connection by the WLAN, it is proposed to limit it to AAA connectivity to EPC.  Added Abbreviation for NSWOF.  Added reference to TS 23.501 for details for AAA connecticity and fucntionality.  **Backward compatibility analysis on the UE:**  The PLMN List with AAA connectivity to 5GC is not backward compatible to 3GPP TS 24.302 V17.6.0. A UE not having implemented this List of PLMN with AAA connectivity to 5GC, cannot determine how to initiate the NSWO authentication procedure specified in TS 33.501.  Limiting the PLMN List IE to AAA connectivity to EPC is backward compatible. A UE not having implemented this List of PLMN with AAA connectivity to 5GC can determine how to initiate the Authentication and Key Agreement procedure specified in TS 33.402  **Backward compatibility analysis on the WLAN:**  The PLMN List with AAA connectivity to 5GC is not backward compatible to 3GPP TS 24.302 V17.6.0. A WLAN not having implemented this List of PLMN with AAA connectivity to 5GC, cannot allocate NSWOF for the UE to perform the NSWO authentication procedure specified in TS 33.501.  Limiting the PLMN List IE to AAA connectivity to EPC is backward compatible. A WLAN not having implemented this List of PLMN with AAA connectivity to 5GC can determine how to route the UE's request for the Authentication and Key Agreement procedure specified in TS 33.402 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The UE with NSWO capability cannot identify PLMNs for connecting to NSWOF to perform 5G NSWO authentication procedure defined in TS 33.501. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, 3.2, H.2.4.1,H.4.2.4, H.2.4.X (new) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  |  | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  |  | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* NEXT CHANGE \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] Void.

[2A] 3GPP TS 23.002: "Network architecture".

[3] 3GPP TS 23.003: "Numbering, addressing and identification".

[4] 3GPP TS 23.122: "Non-Access-Stratum (NAS) functions related to Mobile Station (MS) in idle mode".

[5] Void.

[5A] 3GPP TS 23.203: "Policy and Charging Control Architecture".

[6] 3GPP TS 23.402: "Architecture enhancements for non-3GPP accesses".

[6A] 3GPP TS 23.501: "System Architecture for the 5G System; Stage 2".

[7] Void.

[8] Void.

[9] 3GPP TS 24.234 v12.2.0: "3GPP System to Wireless Local Area Network (WLAN) interworking; WLAN User Equipment (WLAN UE) to network protocols".

[10] 3GPP TS 24.301: "Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS)".

[11] 3GPP TS 24.303: "Mobility management based on Dual-Stack Mobile IPv6".

[12] 3GPP TS 24.304: "Mobility management based on Mobile IPv4; User Equipment (UE) - Foreign Agent interface".

[13] 3GPP TS 24.312: "Access Network Discovery and Selection Function (ANDSF) Management Object (MO)".

[14] 3GPP TS 25.304: "User Equipment (UE) procedures in idle mode and procedures for cell reselection in connected mode".

[14A] 3GPP TS 25.331: "Radio Resource Control (RRC); Protocol Specification".

[15] 3GPP TS 33.402: "3GPP System Architecture Evolution: Security aspects of non-3GPP accesses".

[16] 3GPP TS 36.304: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) procedures in idle mode".

[16A] 3GPP TS 45.008: "Radio Access Network; Radio subsystem link control".

[16B] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA) Radio Resource Control (RRC); Protocol specification".

[17] 3GPP TS 29.273: "Evolved Packet System; 3GPP EPS AAA Interfaces".

[18] 3GPP TS 29.275: "Proxy Mobile IPv6 (PMIPv6) based Mobility and Tunnelling protocols".

[19] 3GPP TS 29.276: "Optimized Handover Procedures and Protocols between EUTRAN Access and cdma2000 HRPD Access".

[20] 3GPP2 X.S0057-B v2.0: "E-UTRAN - HRPD Connectivity and Interworking: Core Network Aspects".

[21] 3GPP2 C.S0087-A v4.0: "E-UTRAN – HRPD and CDMA2000 1x Connectivity and Interworking: Air Interface Aspects".

[22] Void.

[23] 3GPP2 C.S0024-B v3.0: "cdma2000® High Rate Packet Data Air Interface Specification".

[23A] 3GPP2 C.S0016-D v1.0: "Over-the-Air Service Provisioning of Mobile Stations in Spread Spectrum Standards".

[24] WiMAX Forum Network Architecture Release 1.0 version 1.2 – Stage 2: "Architecture Tenets, Reference Model and Reference Points", November 2007.

[25] WiMAX Forum Network Architecture Release 1.0 version 1.2 – Stage 3: "Detailed Protocols and Procedures", November 2007.

[26] WiMAX Forum Mobile System Profile Release 1.0 Approved Specification Revision 1.4.0, April 2007.

[27] IEEE Std 802.16e-2005 and IEEE Std 802.16-2004/Cor1-2005: "IEEE Standard for Local and Metropolitan Area Networks, Part 16: Air Interface for Fixed and Mobile Broadband Wireless Access Systems Amendments 2 and Corrigendum 1", February 2006.

[28] IETF RFC 7296 7296 (October 2014): "Internet Key Exchange Protocol Version 2 (IKEv2)".

[29] IETF RFC 3748 (June 2004): "Extensible Authentication Protocol (EAP)".

[30] IETF RFC 4301 (December 2005): "Security Architecture for the Internet Protocol".

[31] IETF RFC 4555 (June 2006): "IKEv2 Mobility and Multihoming Protocol (MOBIKE)".

[32] IETF RFC 4303 (December 2005): "IP Encapsulating Security Payload (ESP)".

[33] IETF RFC 4187 (January 2006): "Extensible Authentication Protocol Method for 3rd Generation Authentication and Key Agreement (EAP-AKA)"

[34] IETF RFC 3629 (November 2003): "UTF-8, a transformation format of ISO 10646".

[35] IETF RFC 1035 (November 1987): "DOMAIN NAMES - IMPLEMENTATION AND SPECIFICATION".

[36] Void.

[37] IETF RFC 6153 (February 2011): "DHCPv4 and DHCPv6 Options for Access Network Discovery and Selection Function (ANDSF) Discovery".

[38] IETF RFC 5448 (May 2009): "Improved Extensible Authentication Protocol Method for 3rd Generation Authentication and Key Agreement (EAP-AKA')".

[39] OMA-ERELD-DM-V1\_2: "Enabler Release Definition for OMA Device Management".

[40] Void

[41] "Unicode 5.1.0, Unicode Standard Annex #15; Unicode Normalization Forms", March 2008. <http://www.unicode.org>.

[42] 3GPP TS 33.220: "Generic Authentication Architecture (GAA); Generic bootstrapping architecture".

[43] 3GPP TS 29.109: "Generic Authentication Architecture (GAA); Zh and Zn Interfaces based on the Diameter protocol".

[44] 3GPP TS 33.222: "Generic Authentication Architecture (GAA); Access to network application functions using Hypertext Transfer Protocol over Transport Layer Security (HTTPS)".

[45] 3GPP TS 31.102: "Characteristics of the Universal Subscriber Identity Module (USIM) application".

[46] 3GPP TS 24.008: "Mobile radio interface Layer 3 specification; Core network protocols; Stage 3".

[47] 3GPP TS 33.223: "Generic Authentication Architecture (GAA); Generic Bootstrapping Architecture (GBA) Push function".

[48] 3GPP TS 24.007: "Mobile radio interface signalling layer 3; General aspects".

[49] IETF RFC 4739: "Multiple Authentication Exchanges in the Internet Key Exchange (IKEv2) Protocol".

[50] 3GPP TS 29.274: "Tunnelling Protocol for Control plane (GTPv2-C)".

[51] 3GPP TS 24.139: "3GPP System-Fixed Broadband Access Network Interworking; Stage 3".

[52] 3GPP TS 24.109: "Bootstrapping interface (Ub) and network application function interface (Ua); Protocol details".

[53] IETF RFC 2817 (May 2000): "Upgrading to TLS Within HTTP/1.1".

[54] Void.

[55] Void.

[56] 3GPP TS 24.244: "Wireless LAN control plane protocol for trusted WLAN access to EPC".

[57] IEEE Std 802.11-2016: "IEEE Standard for Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements - Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications".

[58] IEEE Std 802-2014: "IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture", 30th June 2014.

[59] Void.

[60] IETF RFC 4284 (January 2006): "Identity Selection Hints for the Extensible Authentication Protocol (EAP)".

[61] IEEE Std 802.1X™-2010: "IEEE Standard for Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Port-based Network Access Control".

[62] IETF RFC 4282: "The Network Access Identifier".

[63] ITU-T Recommendation E.212: "The international identification plan for mobile terminals and mobile users".

[64] IETF RFC 7651 (September 2015): "3GPP IP Multimedia Subsystems (IMS) Option for the Internet Key Exchange Protocol Version 2 (IKEv2)".

[65] 3GPP TS 33.310: "Network Domain Security (NDS); Authentication Framework (AF)".

[66] 3GPP TS 23.380: "IMS Restoration Procedures".

[67] 3GPP TS 24.229: "IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3".

[68] 3GPP TS 23.161: "Network-Based IP Flow Mobility (NBIFOM); Stage 2".

[69] 3GPP TS 24.161: "Network-Based IP Flow Mobility (NBIFOM); Stage 3".

[70] 3GPP TS 36.300: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2".

[70A] IETF RFC 4309 (December 2005): "Internet Key Exchange Protocol Version 2 (IKEv2)".

[70B] IETF RFC 7296 (October 2014): "Internet Key Exchange Protocol Version 2 (IKEv2)".

[71] IETF RFC 6696 (July 2012): "EAP Extensions for the EAP Re-authentication Protocol (ERP)".

[72] IETF RFC 3948 (January 2005): "UDP Encapsulation of IPsec ESP Packets".

[73] IETF RFC 2234 (November 1997): "Augmented BNF for Syntax Specification: ABNF".

[74] IETF RFC 5279 (July 2008): "A Uniform Resource Name (URN) Namespace for the 3rd Generation Partnership Project (3GPP)".

[75] IETF RFC 2474 (December 1998): "Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers".

[76] 3GPP TS 24.501: "Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3".

[77] 3GPP TR 24.502: "Access to the 3GPP 5G Core Network (5GCN) via non-3GPP access networks".

[78] 3GPP TS 33.501: "Security architecture and procedures for 5G System".

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## 3.2 Abbreviations

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

AAA Authentication, Authorization and Accounting

ACL Access Control List

AKA Authentication and Key Agreement

ANDSF Access Network Discovery and Selection Function

ANDSF-SN Access Network Discovery and Selection Function Server Name

ANID Access Network Identity

ANQP Access Network Query Protocol

APN Access Point Name

DHCP Dynamic Host Configuration Protocol

DM Device Management

DNS Domain Name System

DSCP Differentiated Services Code Point

DSMIPv6 Dual-Stack MIPv6

eAN/PCF Evolved Access Network Packet Control Function

EAP Extensible Authentication Protocol

EPC Evolved Packet Core

ePDG Evolved Packet Data Gateway

EPS Evolved Packet System

ERP EAP Re-authentication Protocol

ESP Encapsulating Security Payload

FQDN Fully Qualified Domain Name

GAA Generic Authentication Architecture

GBA Generic Bootstrapping Architecture

HA Home Agent

H-ANDSF Home-ANDSF

HRPD High Rate Packet Data

HSGW HRPD Serving Gateway

IEEE Institute of Electrical and Electronics Engineers

IFOM IP Flow Mobility

IKEv2 Internet Key Exchange version 2

IARP Inter-APN Routing Policy

IPMS IP Mobility Mode Selection

ISMP Inter-system Mobility Policy

ISRP Inter-system Routing Policy

IANA Internet Assigned Numbers Authority

I-WLAN Interworking – WLAN

MAPCON Multi Access PDN Connectivity

MCM Multi-connection mode

MO Management Object

NAI Network Access Identifier

NAP Network Access Provider

NBIFOM Network-Based IP Flow Mobility

NBM Network based mobility management

NSP Network Service Provider

NSSAI Network Slice Selection Assistance Information

NSWO Non-Seamless WLAN Offload

NSWOF Non-Seamless WLAN Offload Function

OMA Open Mobile Alliance

OPI Offload Preference Indicator

PCO Protocol Configuration Options

P-GW PDN Gateway

PDU Protocol Data Unit

PSPL Preferred Service Provider List

QoS Quality of Service

SCM Single-connection mode

S-GW Serving Gateway

S-NSSAI Single NSSAI

SPI Security Parameters Index

TFT Traffic Flow Template

TSCM Transparent single-connection mode

UE User Equipment

UICC Universal Integrated Circuit Card

V-ANDSF Visited-ANDSF

W-APN WLAN APN

WiMAX Worldwide Interoperability for Microwave Access

WLAN Wireless Local Area Network

WLANSP WLAN Selection Policy

WLCP WLAN Control Protocol

WMF WiMAX Forum

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* NEXT CHANGE \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

### H.2.4.1 Information Element Identity (IEI)

Indicates the information element identity. The following values for IEI are defined in this version of the specification:

00000000 PLMN List

00000001 PLMN List with S2a connectivity

00000010 PLMN List with trusted 5G connectivity

00000011 PLMN List with trusted 5G connectivity-without-NAS

00000100 PLMN List with AAA connectivity to 5GC

00000101

To

11111111 Reserved

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* NEXT CHANGE \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

### H.2.4.2 PLMN List IE

The PLMN List information element is used by the WLAN to indicate the PLMNs deploying the AAA function, with which the WLAN supports AAA connectivity to EPC, see clause 6.3.12.1 in 3GPP TS 23.501 [6A]. The format of the PLMN List information element coded according to 3GPP TS 24.007 [48] clause 11.2.2.1 is shown in figure H.2.4.2-1.



|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |  |
| PLMN List IEI | | | | | | | | octet 1 |
| Length of PLMN List value contents | | | | | | | | octet 2 |
| Number of PLMNs | | | | | | | | octet 3 |
| PLMN information, PLMN 1 | | | | | | | | octet 4  octet 5  octet 6 |
|  | | | | | | | |  |
| PLMN information, PLMN N | | | | | | | | octet N+1  octet N+2  octet N+3 |

Figure H.2.4.2-1: *PLMN List* information element

The "Number of PLMNs" (octet 3) contains the number of PLMN information items in the list. Bit 7 of octet 3 is the most significant bit and bit 0 of octet 3 the least significant bit.

The format of the PLMN information item according to 3GPP TS 24.007 [48] clause 11.2.2.1 is shown in figure H.2.4.2-2:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 7 | 6 | 5 | 4 | 3 | | 2 | 1 | 0 |  |
| MCC digit 2 | | | | | MCC digit 1 | | | | octet X |
| MNC digit 3 | | | | | MCC digit 3 | | | | octet X+1 |
| MNC digit 2 | | | | | MNC digit 1 | | | | octet X+2 |

Figure H.2.4.2-2: *PLMN information* item of the PLMN List IE

Table H.2.4.2-1 shows the coding of the MCC and MNC in the PLMN information item.

Table H.2.4.2-1: *PLMN information* item of PLMN List IE

|  |
| --- |
| **MCC**, Mobile country code (octet X, octet X+1 bits 1 to 4)  The MCC field is coded as in ITU-T Rec. E212 [63], Annex A.  **MNC**, Mobile network code (octet X+2, octet X+1 bits 5 to 8).  The coding of this field is the responsibility of each administrationbutBCDcodingshall be used. The MNC shall consist of 2 or 3 digits. For PCS 1900 for North America, Federal Regulation mandates that a 3-digit MNC shall be used. However a network operator may decide to use only two digits in the MNC over the radio interface. In this case, bits 5 to 8 of octet X+1 shall be coded as "1111". Mobile equipment shall accept MNC coded in such a way. |

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* NEXT CHANGE \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

### H.2.4.X PLMN List with AAA connectivity to 5GC IE

The PLMN List with AAA connectivity to 5GC information element is used by the WLAN to indicate the PLMNs deploying NSWOF, with which the WLAN supports AAA connectivity to 5GC and is able to perform 5G NSWO procedures as specified in annex S of 3GPP TS 33.501 [78].

The format of the PLMN List with AAA connectivity to 5GC information element is identical to the format of the PLMN List information element defined in clause H.2.4.2.

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* END OF CHANGES \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***