**3GPP TSG-CT WG3 Meeting #116e C3-213431**

**E-Meeting, 19th – 28th May 2021 (Revision of C3-213212)**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **29.061** | **CR** | **0538** | **rev** | **2** | **Current version:** | **17.2.0** |  |
|  | | | | | | | | |
| *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 |  | Core Network | **X** |

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|  | | | | | | | | | | |
| ***Title:*** | Updates to support L2TP in Diameter message flow | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | CT3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | BEPoP | | | | |  | ***Date:*** | | | 2021-05-06 |
|  |  | | | |  | |  | | |  |
| ***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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | CT4 has been studied and agreed L2TP supporting for CUPS in WI BEPoP,  TR 29.820 has also concluded to support L2TP tunneling over N6/SGi for 5GC/EPS is to be standardized based on the solution#8 as described in 6.8 in Rel-17, and CT3 scope has been added in WI BEPoP.  Meanwhile, SA2 LS Reply on the support of L2TP with CUPS in rel-17 to support L2TP tunnelling over N6/SGi for 5GS and EPS, with TS 23.214 CR 0076 approved.  Hence the related L2TP support and attributes for Diameter messages need to be added. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Adding Diameter attributes within the grouped "Tunneling" AVP according to RFC 7155 and the basic attributes in Diameter AAA message to support DN AAA server providing L2TP information. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Missing the Diameter attributes in the related Diameter message to support L2TP in this specification, and cannot be referred by TS 29.561. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, 16a.4.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 23.214 CR 0076 | | |
| ***affected:*** | |  | **X** | Test specifications | | | |  | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**Additional discussion(if needed):**

**Proposed changes:**

\*\*\* 1st 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] Void.

[2] 3GPP TS 22.060: "General Packet Radio Service (GPRS); Service Description; Stage 1".

[3] 3GPP TS 23.060: "General Packet Radio Service (GPRS); Service Description; Stage 2".

[4] Void.

[5] Void.

[6] Void.

[7] Void.

[8] Void.

[9] Void.

[10] 3GPP TS 27.060: "Packet Domain; Mobile Station (MS) supporting Packet Switched services".

[11] ITU-T Recommendation E.164: "The international public telecommunication numbering plan".

[12] Void.

[13] Void.

[14] Void.

[15] IETF RFC 768 (1980): "User Datagram Protocol" (STD 6).

[16] IETF RFC 791 (1981): "Internet Protocol" (STD 5).

[17] IETF RFC 792 (1981): "Internet Control Message Protocol" (STD 5).

[18] IETF RFC 793 (1981): "Transmission Control Protocol" (STD 7).

[19] IETF RFC 1034 (1987): "Domain names – concepts and facilities" (STD 7).

[20] Void.

[21a] IETF RFC 1661 (1994): "The Point-to-Point Protocol (PPP)" (STD 51).

[21b] IETF RFC 1662 (1994): "PPP in HDLC-like Framing".

[22] IETF RFC 1700 (1994): "Assigned Numbers" (STD 2).

[23] 3GPP TS 44.008: "Mobile radio interface layer 3 specification; Core Network protocols; Stage 3".

[24] 3GPP TS 29.060: "General Packet Radio Service (GPRS); GPRS Tunnelling Protocol (GTP) across the Gn and Gp interface".

[25] IETF RFC 2794 (2000): "Mobile IP Network Address Identifier Extension for IPv4", P. Calhoun, C. Perkins.

[26] IETF RFC 2131 (1997): "Dynamic Host Configuration Protocol".

[27] IETF RFC 1542 (1993): "Clarification and Extensions for the Bootstrap Protocol".

[28] Void

[29] Void.

[30] IETF RFC 3344 (2002): "IP Mobility Support", C. Perkins.

[31] IETF RFC 2486 (1999): "The Network Access Identifier", B. Aboba and M. Beadles.

[32] Void.

[33] Void.

[34] Void.

[35] Void.

[36] Void.

[37] IETF RFC 2290 (1998): "Mobile-IPv4 Configuration Option for PPP IPCP", J. Solomon, S. Glass.

[38] IETF RFC 2865 (2000): "Remote Authentication Dial In User Service (RADIUS)", C. Rigney, S. Willens, A. Rubens, W. Simpson.

[39] IETF RFC 2866 (2000): "RADIUS Accounting", C. Rigney, Livingston.

[40] 3GPP TS 23.003: "Numbering, addressing and identification".

[41] IETF RFC 3576 (2003): "Dynamic Authorization Extensions to Remote Authentication Dial In User Service (RADIUS)", M.Chiba, M.Eklund, D.Mitton, B.Aboba.

[42] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[43] Void.

[44] Void.

[45] IETF RFC 3118 (2001): "Authentication for DHCP Messages", R. Droms, W. Arbaugh.

[46] IETF RFC 3315 (2003) "Dynamic Host Configuration Protocol for IPv6 (DHCPv6)", R. Droms, J. Bound, B. Volz, T. Lemon, C. Perkins, M. Carney.

[47] 3GPP TS 24.229: "IP Multimedia Call Control Protocol based on SIP and SDP".

[48] IETF RFC 2710 (1999): "Multicast Listener Discovery (MLD) for IPv6", S. Deering, W. Fenner, B. Haberman.

[49] IETF RFC 2460 (1998): "Internet Protocol, Version 6 (IPv6) Specification", S.Deering, R.Hinden.

[50] IETF RFC 3162 (2001): "RADIUS and IPv6", B. Adoba, G. Zorn, D. Mitton.

[51] IETF RFC 2548 (1999): "Microsoft Vendor-specific RADIUS Attributes", G.Zorn.

[52] 3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2".

[53] Void

[54] 3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core Network protocols; Stage 3".

[55] Void.

[56] Void

[57] Void.

[58] IETF RFC 1035 (1987): "Domain names – implementation and specification" (STD 13).

[59] Void.

[60] IETF RFC 1771 (1995): "A Border Gateway Protocol 4 (BGP-4)".

[61] IETF RFC 1825 (1995): "Security Architecture for the Internet Protocol".

[62] IETF RFC 1826 (1995): "IP Authentication Header".

[63] IETF RFC 1827 (1995): "IP Encapsulating Security Payload (ESP)".

[64] Void.

[65] 3GPP TS 23.246: "Multimedia Broadcast/Multicast Service (MBMS) Architecture and Functional Description".

[66] Void.

[67] Void.

[68] 3GPP TS 23.141: "Presence Service; Architecture and functional description".

[69] 3GPP TS 32.422: "Subscriber and equipment trace: Trace Control and Configuration Management".

[70] 3GPP TS 48.018: "Base Station System (BSS) – Serving GPRS Support Node (SGSN); BSS GPRS Protocol (BSSGP)".

[71] 3GPP TS 23.107: "Quality of Service (QoS) Concept and Architecture".

[72] 3GPP TS 25.346: "Introduction of the Multimedia Broadcast Multicast Service (MBMS) in the Radio Access Network (RAN)".

[73] IETF RFC 4604 (2006): "Using Internet Group Management Protocol Version 3 (IGMPv3) and Multicast Listener Discovery Protocol Version 2 (MLDv2) for Source-Specific Multicast".

[74] IETF RFC 4607 (2006): "Source-Specific Multicast for IP".

[75] 3GPP TS 29.212: "Policy and Charging Control (PCC); Reference points".

[76] 3GPP TS 29.213: "Policy and charging control signalling flows and Quality of Service (QoS) parameter mapping".

[77] 3GPP TS 23.401: "General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access".

[78] 3GPP TS 23.402: "Architecture enhancements for non-3GPP accesses".

[79] IETF RFC 4039 (2005): "Rapid Commit Option for the Dynamic Host Configuration Protocol version 4 (DHCPv4)".

[80] IETF RFC 3736 (2004): "Stateless Dynamic Host Configuration Protocol (DHCP) Service for IPv6".

[81] 3GPP TS 29.274: "Evolved GPRS Tunnelling Protocol for EPS (GTPv2)".

[82] IETF RFC 4291 (2006): "IP Version 6 Addressing Architecture".

[83] IETF RFC 4862 (2007): "IPv6 Stateless Address Autoconfiguration".

[84] 3GPP TS 24.301: "Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS)".

[85] IETF RFC 2132 (1997): "DHCP Options and BOOTP Vendor Extensions".

[86] IETF RFC 3361 (2002): "Dynamic Host Configuration Protocol (DHCP-for-IPv4) Option for Session Initiation Protocol (SIP) Servers".

[87] IETF RFC 3646 (2003): "DNS Configuration options for Dynamic Host Configuration Protocol for IPv6 (DHCPv6)".

[88] IETF RFC 3319 (2003): "Dynamic Host Configuration Protocol (DHCPv6) Options for Session Initiation Protocol (SIP) Servers".

[89] IETF RFC 4861 (2007): "Neighbor Discovery for IP Version 6 (IPv6)".

[90] 3GPP TS 23.203: "Policy and charging control architecture".

[91] IETF RFC 4739 (2006): "Multiple Authentication Exchanges in the Internet Key Exchange (IKEv2) Protocol".

[92] 3GPP TS 25.413: "UTRAN Iu Interface RANAP Signalling".

[93] IETF RFC 5176 (2008): "Dynamic Authorization Extentions to Remote Authentication Dial In User Service (RADIUS)".

[94] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification".

[95] 3GPP TS 23.380: "IMS Restoration Procedures".

[96] 3GPP TS 29.303: "Domain Name System Procedures; Stage 3".

[97] IETF RFC 4818 (2007): "RADIUS Delegated-IPv6-Prefix Attribute".

[98] 3GPP TS 36.300: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description"

[99] 3GPP TS 23.221: "Architectural requirements".

[100] 3GPP TS 23.682: "Architecture Enhancements to facilitate communications with Packet Data Networks and Applications".

[101] 3GPP TS 29.336: "Home Subscriber Server (HSS) Diameter interfaces for interworking with packet data networks and applications".

[102] IETF RFC 4282 (2005): "The Network Access Identifier".

[103] 3GPP TS 29.275: "Proxy Mobile IPv6 (PMIPv6) based Mobility and Tunnelling protocols; Stage 3".

[104] 3GPP TS 23.007: "Restoration procedures".

[105] 3GPP TS 29.229: "Cx and Dx interfaces based on Diameter protocol; Protocol details".

[106] 3GPP TS 25.446: "MBMS synchronisation protocol (SYNC)".

[107] 3GPP TS 25.323: "Packet Data Convergence Protocol (PDCP) specification".

[108] Void.

[109] IETF RFC 4960 (2007): "Stream Control Transmission Protocol".

[110] 3GPP TS 29.128: "Mobility Management Entity (MME) and Serving GPRS Support Node (SGSN) interfaces for interworking with packet data networks and applications ".

[111] IETF RFC 6733: "Diameter Base Protocol".

[112] 3GPP TS 23.285: "Architecture Enhancements for V2X services".

[113] 3GPP TS 29.468: "Group Communication System Enablers for LTE (GCSE\_LTE); MB2 Reference point; Stage 3".

[114] 3GPP TS 29.244: "Interface between the Control Plane and the User Plane of EPC Nodes; Stage 3".

[115] 3GPP TS 38.413: "NG Radio Access Network (NG-RAN); NG Application Protocol (NGAP)".

[116] IETF RFC 2869: "RADIUS Extensions".

[m4] IETF RFC 7155: "Diameter Network Access Server Application".

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

### 16a.4.2 AAA Command

The AAA command, defined in Diameter NASREQ (IETF RFC 7155 [m4]), is indicated by the Command-Code field set to 265 and the ‘R’ bit cleared in the Command Flags field., It is sent by the Diameter server to the GGSN/P-GW in response to the AAR command.

The relevant AVPs that are of use for the Gi/Sgi interface are detailed in the ABNF description below. Other valid AVPs for this command are not used for Gi/Sgi purposes and should be ignored by the receiver or processed according to the relevant specifications.

The "Tunneling" AVP may include the "Tunnel-Type" with value 3 to represent L2TP tunnel type, "Tunnel-Medium-Type" and "Tunnel-Server-Endpoint" AVPs. If more than one set of these "Tunneling" AVPs are provided, the optional "Tunnel-Preference" AVP may be provided in each set to identify the relative preference. The Tunnel-Password AVP may be used to authenticate to a remote server.

NOTE: The other optional AVPs within the "Tunneling" AVPs can be referred to the IETF RFC 7155[m4] with implementation specific.

Editor’s Note: Whether the Tunnel-Password can be included will be confirmed by SA3.

The bold marked AVPs in the message format indicate optional AVPs for Gi/Sgi, or modified existing AVPs.

Message Format:

<AA-Answer> ::= < Diameter Header: 265, PXY >

< Session-Id >

{ Auth-Application-Id }

{ Auth-Request-Type }

{ Result-Code }

{ Origin-Host }

{ Origin-Realm }

[ User-Name ]

[ Service-Type ]

\* [ Class ]

[ Acct-Interim-Interval ]

[ Error-Message ]

[ Error-Reporting-Host ]

[ Failed-AVP ]

[ Idle-Timeout ]

[ Authorization-Lifetime ]

[ Auth-Grace-Period ]

[ Auth-Session-State ]

[ Re-Auth-Request-Type ]

[ Multi-Round-Time-Out ]

[ Session-Timeout ]

\* [ Reply-Message ]

[ Origin-State-Id ]

\* [ Filter-Id ]

[ Port-Limit ]

[ Prompt ]

[ Callback-Id ]

[ Callback-Number ]

\* [ Framed-Compression ]

[ Framed-Interface-Id ]

[ Framed-IP-Address ]

\* [ Framed-IPv6-Prefix ]

[ Framed-IPv6-Pool ]

\* [ Framed-IPv6-Route ]

\* [ Delegated-IPv6-Prefix ]

[ Framed-IP-Netmask ]

\* [ Framed-Route ]

[ Framed-Pool ]

[ Framed-IPX-Network ]

[ Framed-MTU ]

[ Framed-Protocol ]

[ Framed-Routing ]

\* [ Login-IP-Host ]

\* [ Login-IPv6-Host ]

[ Login-LAT-Group ]

[ Login-LAT-Node ]

[ Login-LAT-Port ]

[ Login-LAT-Service ]

[ Login-Service ]

[ Login-TCP-Port ]

\* [ NAS-Filter-Rule ]

\* [ QoS-Filter-Rule ]

\* [ Tunneling ]

\* [ Redirect-Host ]

[ Redirect-Host-Usage ]

[ Redirect-Max-Cache-Time ]

\* [ Proxy-Info ]

**[ 3GPP-IPv6-DNS-Servers ]**

\* **[ External-Identifier]**

\* [ AVP ]

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