**3GPP TSG-CT WG3 Meeting #111eC3-205abc**

**E-meeting, 19th – 28th August 2020 (Revision of C3-205306)**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **29.061** | **CR** | **0529** | **rev** | **1** | **Current version:** | **17.0.0** |  |
|  | | | | | | | | |
| *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:*** | Corrections to Delegated-IPv6-Prefix | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | CT3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | TEI16, SAES-St3-intwk | | | | |  | ***Date:*** | | | 2020-10-28 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **A** |  | | | | | ***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:*** | | 1.The NOTE description "Delegated Ipv6 prefix shall be present if the user was delegated an Ipv6 prefix from a local pool." in Access-Request message and Accounting-Request messages between GGSN/PDN GW and AAA server, does not align with below descriptions:   1. "When PLMN based parameter configuration is used, the GGSN/PDN GW provides the requested Ipv6 prefix from a locally provisioned pool" in clause 11.2.1.3.5. 2. "It MAY appear in an Access-Request packet as a hint by the NAS to the server that it would prefer these prefix(es), but the server is not required to honor the hint" in the reference RFC 4818. 3. "Examples of ways in which the delegating router might select prefix(es) for a requesting router include: static assignment based on subscription to an ISP; dynamic assignment from a pool of available prefixes; selection based on an external authority such as a RADIUS server" in RFC 3633 as the normative reference of RFC 4818.   I.e. No normative reference could be found to support the NOTE description.  Hence "the user was delegated an Ipv6 prefix from a local pool by GGSN/PDN GW as the delegating router" is not the condition that Delegated IPv6 prefix shall be present. The condition shall be "the slection based an external authority such as a RADIUS server" instead.  2. Delegated-Ipv6-Prefix in Disconnect Request message also does not align with "The Delegated-IPv6-Prefix MUST NOT appear in any other RADIUS  packets." in the reference RFC 4818.  3. Delegated-Ipv6-Prefix in this release is not consistent with Delegated-IPv6-Prefix in the reference RFC 4818. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Updates the NOTE description to be "Delegated IPv6 prefix shall be present if IPv6 prefix delegation is required from AAA server".  Remove Delegated-Ipv6-Prefix in Disconnect Request message.  Correct Delegated-Ipv6-Prefix as Delegated-IPv6-Prefix to be aligned with RFC 4818. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Not supporting the external DN-AAA server delegating IPv6 prefix correctly, wrong external IPv6 prefix delegated to PLMN assigned UE IP address. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, 16.4.1, 16.4.2, 16.4.3, 16.4.4, 16.4.8, 16.4.9, 16a.4.1, 16a.4.2, 16a.4.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

**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.

1. References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.
2. For a specific reference, subsequent revisions do not apply.
3. 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] IETF RFC 3588: "Diameter Base Protocol".

[67] IETF RFC 4005 (2005): "Diameter Network Access Server Application".

[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".

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

### 16.4.1 Access-Request message (sent from GGSN/P-GW to AAA server)

Table 1 describes the attributes of the Access-Request message.

Table 1: The attributes of the Access-Request message

| Attr # | Attribute Name | Description | Content | | Presence Requirement |
| --- | --- | --- | --- | --- | --- |
| 1 | User-Name | Username is provided to the GGSN/P-GW by the user in Protocol Configuration Options (PCO) or for the case of the P-GW when multiple authentications are supported in the Additional Protocol Configuration Options (APCO) received during IP-CAN session establishment procedure. If PPP PDP type is used, it is provided to the GGSN by the user during PPP authentication phase. If no username is available, a generic username, configurable on a per APN basis, shall be present. | String | | Mandatory |
| 2 | User-Password | User password is provided to the GGSN/P-GW by the user in the PCO or for the case of the P-GW when multiple authentications are supported in the APCO received during IP-CAN session establishment procedure if PAP is used, If PPP PDP type is used, it is provided to the GGSN by the user during PPP authentication phase. If no password is available a generic password, configurable on a per APN basis, shall be present. | String | | Conditional  Note 1 |
| 3 | CHAP-Password | CHAP password is provided to the GGSN/P-GW by the user in the PCO or for the case of the P-GW when multiple authentications are supported in the APCO received during IP-CAN session establishment procedure, If PPP PDP type is used, it is provided to the GGSN by the user during PPP authentication phase. | String | | Conditional  Note 2 |
| 4 | NAS-IP-Address | Ipv4 address of the GGSN/P-GW for communication with the AAA server. | Ipv4 | | Conditional  Note 3 and 7 |
| 95 | NAS-Ipv6-Address | Ipv6 address of the GGSN/P-GW for communication with the AAA server. | Ipv6 | | Conditional  Note 3 and 7 |
| 32 | NAS-Identifier | Hostname of the GGSN/P-GW for communication with the AAA server. | String | | Conditional  Note 3 |
| 6 | Service-Type | Indicates the type of service for this user | 2 (Framed)  or  17 (Authorize Only)  Note 9 | | Optional |
| 7 | Framed-Protocol | Indicates the type of protocol for this user | 7 (GPRS PDP Context) | | Optional  Note 8 |
| 8 | Framed-IP-Address | Ipv4 address allocated for this user | Ipv4 | Conditional Note 4 | |
| 9 | Framed-IP-Netmask | Netmask for the user Ipv4 address | Ipv4 | Conditional Note 4 | |
| 97 | Framed-Ipv6-Prefix | Ipv6 prefix allocated for this user | Ipv6 | Conditional  Note 4 | |
| 123 | Delegated-IPv6-Prefix | IPv6 prefix delegated to the user. | IPv6 | Conditional Note 10 | |
| 96 | Framed-Interface-Id | Ipv6 Interface Identifier provided by the GGSN/P-GW to the UE at Initial Attach. | 64 bits as per IETF RFC 3162 [50] | Optional Note 5 | |
| 30 | Called-Station-Id | Identifier for the target network | APN (UTF-8 encoded characters) | | Mandatory |
| 31 | Calling-Station-Id | This attribute is the identifier for the MS, and it shall be configurable on a per APN basis. | MSISDN in international format according to 3GPP TS 23.003 [40], UTF-8 encoded decimal character. (Note 6) | | Optional |
| 60 | CHAP-Challenge | CHAP Challenge is provided to the GGSN/P-GW by the user in the PCO or for the case of the P-GW when multiple authentications are supported in the APCO received during the IP-CAN session establishment procedure. If PPP PDP type is used, it is provided to the GGSN by the user durng PPP authentication phase. | String | | Conditional  Note 2 |
| 61 | NAS-Port-Type | Port type for the GGSN/P-GW | As per RFC 2865 [38] | | Optional |
| 26/10415 | 3GPP Vendor-Specific | Sub-attributes according subclause 16.4.7 | See subclause 16.4.7 | | Optional except sub-attribute 3 and 27 which are conditional |
| NOTE 1: Shall be present if PAP is used.  NOTE 2: Shall be present if CHAP is used.  NOTE 3: Either NAS-IP-Address or NAS-Identifier shall be present.  NOTE 4: Ipv4 address and/or Ipv6 prefix attributes shall be present. The IP protocol version for end-user and network may be different.  NOTE 5: As per subclause 9.2.1.1 of 3GPP TS 23.060 [3] and subclause 5.3.1.2.2 of 3GPP TS 23.401 [77] the UE shall use this interface identifier to configure its link-local address, however the UE can choose any interface identifier to generate its Ipv6 address(es) other than link-local without involving the network .  NOTE 6: There are no leading characters in front of the country code.  NOTE 7: Either Ipv4 or Ipv6 address attribute shall be present.  NOTE 8: Framed-Protocol value of 7 is used by both GGSN and P-GW when interworking with RADIUS AAA servers. When used for P-GW, it represents the IP-CAN bearer.  NOTE 9: Service-Type attribute value of "Authorize Only" (RFC 5176 [93]) is only applicable for P-GW/GGSN when deferred Ipv4 addressing for a UE needs to be performed for PDN/PDP type Ipv4v6. In this use case, the Access Request at UE’s initial access shall have Service-Type value "Framed", but the subsequent Access Request shall have Service-Type value of "Authorize Only". In both Access-Request messages, the 3GPP-Allocate-IP-Type sub-attribute shall be present. See subclause 16.4.7.2 for the typical uses cases how 3GPP-Allocate-IP-Type subattribute is utilised in Access-Request messages.  NOTE 10: Delegated IPv6 prefix shall be present if IPv6 prefix delegation is required from the external DN-AAA server. | | | | | |

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

### 16.4.2 Access-Accept (sent from AAA server to GGSN/P-GW)

Table 2 describes the attributes of the Access-Accept message. See RFC 2548 [51] for definition of MS specific attributes.

Table 2: The attributes of the Access-Accept message

| Attr # | Attribute Name | Description | Content | Presence Requirement |
| --- | --- | --- | --- | --- |
| 1 | User-Name | Username received in the Access-Request message or a substitute username provided by the AAA server. If the User-Name has been received in the Access-Accept message, this user-name shall be used in preference to the above | String | Optional |
| 6 | Service-Type | Indicates the type of service for this user | Framed | Optional |
| 7 | Framed-Protocol | Indicates the type of protocol for this user | 7 (GPRS PDP Context) | Optional  Note 4 |
| 8 | Framed-IP-Address | Ipv4 address allocated for this user, if the AAA server is used to allocate IP address. | Ipv4 | Conditional Note 2 |
| 9 | Framed-IP-Netmask | Netmask for the user Ipv4 address, if the AAA server is used to allocate IP netmask. | Ipv4 | Conditional Note 2 |
| 97 | Framed-Ipv6-Prefix | Ipv6 address prefix allocated for this user, if the AAA server is used to allocate Ipv6 address prefixes. | Ipv6 | Conditional  Note 2 |
| 123 | Delegated-IPv6-Prefix | IPv6 prefix delegated to the user. | IPv6 | Conditional Note 6 |
| 96 | Framed-Interface-Id | Ipv6 Interface Identifier provided by the GGSN/P-GW to the UE at Initial Attach. | 64 bits as per IETF RFC 3162 [50] | Optional Note 7 |
| 100 | Framed-Ipv6-Pool | Name of the Ipv6 prefix pool for the specific APN | String | Optional  Note 2 |
| 12 | Framed-MTU | Maximum Transmission Unit of the PDP PDUs, between the MS and GGSN/P-GWs (Note 5) | String | Optional |
| 25 | Class | Identifier to be used in all subsequent accounting messages. | String | Optional (Note 1) |
| 27 | Session-Timeout | Indicates the timeout value (in seconds) for the user session | 32 bit unsigned Integer | Optional |
| 28 | Idle-Timeout | Indicates the timeout value (in seconds) for idle user session | 32 bit unsigned Integer | Optional |
| 26/311 | MS- Primary-DNS-Server | Contains the primary DNS server address for this APN | Ipv4 | Optional  Note 3 |
| 26/311 | MS-Secondary-DNS-Server | Contains the secondary DNS server address for this APN | Ipv4 | Optional  Note 3 |
| 26/311 | MS-Primary-NBNS-Server | Contains the primary NetBIOS name server address for this APN | Ipv4 | Optional  Note 3 |
| 26/311 | MS-Secondary-NBNS-Server | Contains the secondary NetBIOS server address for this APN | Ipv4 | Optional  Note 3 |
| 26/10415 /17 | 3GPP-Ipv6-DNS-Servers | List of Ipv6 addresses of DNS servers for this APN | Ipv6 | Optional  Note 3 |
| NOTE 1: The presence of this attribute is conditional upon this attribute being received in the Access-Accept message  NOTE 2: Ipv4 address and/or Ipv6 prefix attributes shall be present.The IP protocol version for end-user and network may be different.  NOTE 3: Depending on IP address(es) allocated to the user, either or both Ipv4 and Ipv6 address attributes shall be present.  NOTE 4: Framed-Protocol value of 7 is used by both GGSN and P-GW when interworking with RADIUS AAA servers. When used for P-GW, it represents the IP-CAN bearer.  NOTE 5: In network deployments that have MTU size of 1500 octets in the transport network, providing a link MTU value of 1358 octets to the MS as part of the IP configuration information from the network will prevent the IP layer fragmentation within the transport network between the MS and the GGSN/P-GW. Link MTU considerations are discussed further in Annex C of 3GPP TS 23.060 [3].  NOTE 6: Delegated IPv6 prefix shall be present if the user was delegated an IPv6 prefix.  NOTE 7: As per subclause 9.2.1.1 of 3GPP TS 23.060 [3] and subclause 5.3.1.2.2 of3GPP TS 23.401 [77] the UE shall use this interface identifier to configure its link-local address, however the UE can choose any interface identifier to generate its Ipv6 address(es) other than link-local without involving the network. | | | | |

\*\*\* 4th Change \*\*\*

### 16.4.3 Accounting-Request START (sent from GGSN/P-GW to AAA server)

Table 3 describes the attributes of the Accounting-Request START message.

Table 3: The attributes of the Accounting-Request START message

| Attr # | Attribute Name | Description | Content | | Presence Requirement | |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | User-Name | Username is provided to the GGSN/P-GW by the user in received during IP-CAN session establishment procedure. If PPP PDP type is used, it is provided to the GGSN by the user during PPP authentication phase. If no username is available a generic username, configurable on a per APN basis, shall be present. If the User-Name has been received in the Access-Accept message, this user-name shall be used in preference to the above | String | | Optional | |
| 4 | NAS-IP-Address | GGSN/P-GW Ipv4 address for communication with the AAA server. | Ipv4 | | Conditional  Notes 1 and 7 | |
| 95 | NAS-Ipv6-Address | GGSN/P-GW Ipv6 address for communication with the AAA server. | Ipv6 | | Conditional  Notes 1 and 7 | |
| 32 | NAS-Identifier | Hostname of the GGSN/P-GW for communication with the AAA server. | String | | Conditional  Note 1 | |
| 6 | Service-Type | Indicates the type of service for this user | Framed | | Optional | |
| 7 | Framed-Protocol | Indicates the type of protocol for this user | 7 (GPRS PDP Context) | | Optional  Note 8 | |
| 8 | Framed-IP-Address | User Ipv4 address | Ipv4 | | Conditional Note 3 | |
| 97 | Framed-Ipv6-Prefix | User Ipv6 Prefix | Ipv6 | | Conditional  Note 3 | |
| 123 | Delegated-IPv6-Prefix | Delegates IPv6 Prefix to the user | IPv6 | | Conditional Note 9 | |
| 96 | Framed-Interface-Id | Ipv6 Interface Identifier provided by the GGSN/P-GW to the UE at Initial Attach. | 64 bits as per IETF RFC 3162 [50] | | Optional Note 4 | |
| 25 | Class | Received in the Access-Accept | String | | Conditional (Note 2) | |
| 30 | Called-Station-Id | Identifier for the target network | APN (UTF-8 encoded) | | Mandatory | |
| 31 | Calling-Station-Id | This attribute is the identifier for the MS, and it shall be configurable on a per APN basis. | MSISDN in international format according to 3GPP TS 23.003 [40], UTF-8 encoded decimal character. (Note 6) | | Optional | |
| 40 | Acct-Status-Type | Type of accounting message | START | | Mandatory | |
| 41 | Acct-Delay-Time | Indicates how many seconds the GGSN/P-GW has been trying to send this record for, and can be subtracted from the time of arrival on the AAA server to find the approximate time (in seconds) of the event generating this Accounting-Request. | 32 unsigned integer | | Optional | |
| 44 | Acct-Session-Id | User session identifier. | GGSN/P-GW IP address (Ipv4 or Ipv6) and Charging-ID concatenated in a UTF-8 encoded hexadecimal character.  (Note 5) | | Mandatory | |
| 45 | Acct-Authentic | Authentication method | RADIUS or LOCAL | | Optional | |
| 61 | NAS-Port-Type | Port type for the GGSN/P-GW | As per RFC 2865 [38] | | Optional | |
| 26/10415 | 3GPP Vendor-Specific | Sub-attributes according subclause 16.4.7. | | See subclause 16.4.7 | | Optional except sub-attribute 3 which is conditional |
| NOTE 1: Either NAS-IP-Address or NAS-Identifier shall be present.  NOTE 2: The presence of this attribute is conditional upon this attribute being received in the Access-Accept message  NOTE 3: Ipv4 address and/or Ipv6 prefix attributes shall be present.The IP protocol version for end-user and network may be different.  NOTE 4: As per subclause 9.2.1.1 of 3GPP TS 23.060 [3] and subclause 5.3.1.2.2 of 3GPP TS 23.401 [77] the UE shall use this interface identifier to configure its link-local address, however the UE can choose any interface identifier to generate its Ipv6 address(es) other than link-local without involving the network .  NOTE 5: The GGSN/P-GW IP address is the same one that is used in the CDRs generated by the GGSN/P-GW.  NOTE 6: There are no leading characters in front of the country code.  NOTE 7: Either Ipv4 or Ipv6 address attribute shall be present.  NOTE 8: Framed-Protocol value of 7 is used by both GGSN and P-GW when interworking with RADIUS AAA servers. When used for P-GW, it represents the IP-CAN bearer.  NOTE 9: Delegated IPv6 prefix shall be present if IPv6 prefix delegation is required from the external DN-AAA server. | | | | | | |

\*\*\* 5th Change \*\*\*

### 16.4.4 Accounting Request STOP (sent from GGSN/P-GW to AAA server)

Table 4 describes the attributes of the Accounting-Request STOP message.

Table 4: The attributes of the Accounting-Request STOP message

| Attr # | Attribute Name | Description | Content | Presence Requirement | |
| --- | --- | --- | --- | --- | --- |
| 1 | User-Name | Username is provided to the GGSN/P-GW by the user in the PCO or for the case of the P-GW when multiple authentications are supported in the APCO received during IP-CAN session establishment procedure. If PPP PDP type is used, it is provided to the GGSN by the user during PPP authentication phase. If no username is available a generic username, configurable on a per APN basis, shall be present. If the User-Name has been received in the Access-Accept message, this username shall be used in preference to the above. | String | Optional | |
| 4 | NAS-IP-Address | Ipv4 address of the GGSN/P-GW for communication with the AAA server. | Ipv4 | Conditional  Notes 1 and 7 | |
| 95 | NAS-Ipv6-Address | Ipv6 address of the GGSN/P-GW for communication with the AAA server. | Ipv6 | Conditional  Notes 1 and 7 | |
| 32 | NAS-Identifier | Hostname of the GGSN/P-GW for communication with the AAA server. | String | Conditional  Note 1 | |
| 6 | Service-Type | Indicates the type of service for this user | Framed | Optional | |
| 7 | Framed-Protocol | Indicates the type of protocol for this user | 7 (GPRS PDP Context) | Optional  Note 8 | |
| 8 | Framed-IP-Address | User Ipv4 address | Ipv4 | Conditional Note 3 | |
| 97 | Framed-Ipv6-Prefix | User Ipv6 Prefix | Ipv6 | Conditional Note 3 | |
| 123 | Delegated-IPv6-Prefix | Delegated IPv6 Prefix to the user | IPv6 | Conditional Note 9 | |
| 96 | Framed-Interface-Id | Ipv6 Interface Identifier provided by the GGSN/P-GW to the UE at Initial Attach | 64 bits as per IETF RFC 3162 [50] | Optional Note 4 | |
| 25 | Class | Received in the Access-Accept | String | Optional (Note 2) | |
| 30 | Called-Station-Id | Identifier for the target network | APN (UTF-8 encoded characters) | Mandatory | |
| 31 | Calling-Station-Id | This attribute is the identifier for the MS, and it shall be configurable on a per APN basis. | MSISDN in international format according to 3GPP TS 23.003 [40], UTF-8 encoded characters. (Note 6) | Optional | |
| 40 | Acct-Status-Type | Indicates the type of accounting request | STOP | Mandatory | |
| 41 | Acct-Delay-Time | Indicates how many seconds the GGSN/P-GW has been trying to send this record for, and can be subtracted from the time of arrival on the AAA server to find the approximate time of the event generating this Accounting-Request | Second | Optional | |
| 42 | Acct-Input-Octets | GGSN/P-GW counted number of octets sent by the user for the IP-CAN bearer | 32 bit unsigned integer | Optional | |
| 43 | Acct-Output-Octets | GGSN/P-GW counted number of octets received by the user for the IP-CAN bearer | 32 bit unsigned integer | Optional | |
| 44 | Acct-Session-Id | User session identifier. | GGSN/P-GW IP address (Ipv4 or Ipv6) and Charging-ID concatenated in a UTF-8 encoded hexadecimal character.  (Note 5) | Mandatory | |
| 45 | Acct-Authentic | Authentication method | RADIUS or LOCAL | Optional | |
| 46 | Acct-Session-Time | Duration of the session | Second | Optional | |
| 47 | Acct-Input-Packets | GGSN/P-GW counted number of packets sent by the user | Packet | Optional  (Note 10) | |
| 48 | Acct-Output-Packets | GGSN/P-GW counted number of packets received by the user | Packet | Optional  (Note 10) | |
| 49 | Acct-Terminate-Cause | Indicate how the session was terminated | See IETF RFC 2866 [39] | Optional | |
| 52 | Acct-Input-Gigawords | It indicates how many times the Acct-Input-Octets counter has wrapped around 2^32 and is present if the Acct-Input-Octets counter has wrapped around 2^32. | 32 bit unsigned integer  See IETF RFC 2869 [116] | Conditional | |
| 53 | Acct-Output-Gigawords | It indicates how many times the Acct-Output-Octets counter has wrapped around 2^32 and is present if the Acct-Output-Octets counter has wrapped around 2^32. | 32 bit unsigned integer  See IETF RFC 2869 [116] | Conditional | |
| 61 | NAS-Port-Type | Port type for the GGSN/P-GW | As per IETF RFC 2865 [38] | Optional | |
| 26/10415 | 3GPP Vendor-Specific | Sub-attributes according to subclause 16.4.7. | See subclause 16.4.7 | | Optional except sub-attribute 3 which is conditional |
| NOTE 1: Either NAS-IP-Address or NAS-Identifier shall be present.  NOTE 2: The presence of this attribute is conditional upon this attribute being received in the Access-Accept message  NOTE 3: Ipv4 address and/or Ipv6 prefix attributes shall be present. The IP protocol version for end-user and network may be different.  NOTE 4: As per subclause 9.2.1.1 of 3GPP TS 23.060 [3] and subclause 5.3.1.2.2 of 3GPP TS 23.401 [77] the UE shall use this interface identifier to configure its link-local address, however the UE can choose any interface identifier to generate its Ipv6 address(es) other than link-local without involving the network .  NOTE 5: The GGSN/P-GW IP address is the same one that is used in the CDRs generated by the GGSN/P-GW.  NOTE 6: There are no leading characters in front of the country code.  NOTE 7: Either Ipv4 or Ipv6 address attribute shall be present.  NOTE 8: Framed-Protocol value of 7 is used by both GGSN and P-GW when interworking with RADIUS AAA servers. When used for P-GW, it represents the IP-CAN bearer.  NOTE 9: Delegated IPv6 prefix shall be present if IPv6 prefix delegation is required from the external DN-AAA server.  NOTE 10: This information is not available in Rel-14 and subsequent releases up to the present release if the P-GW is split into a user plane node and control plane node according to 3GPP TS 29.244 [114]. | | | | | |

\*\*\* 6th Change \*\*\*

### 16.4.8 Accounting Request Interim-Update (sent from GGSN/P-GW to AAA server)

Table 8 describes the attributes of the Accounting-Request Interim-Update message.

Table 8: The attributes of the Accounting-Request Interim-Update message

| Attr # | Attribute Name | Description | Content | Presence Requirement | |
| --- | --- | --- | --- | --- | --- |
| 1 | User-Name | Username is provided to the GGSN/P-GW by the user in the PCO or for the case of the P-GW when multiple authentications are supported in the APCO received during IP-CAN session establishment procedure. If PPP PDN type is used, it is provided to the GGSN by the user during PPP authentication phase. If no username is available, a generic username, configurable on a per APN basis, shall be present. If the User-Name has been received in the Access-Accept message, this username shall be used in preference to the above. | String | Optional | |
| 4 | NAS-IP-Address | Ipv4 address of the GGSN/P-GW for communication with the AAA server. | Ipv4 | Conditional  Notes 1 and 7 | |
| 95 | NAS-Ipv6-Address | Ipv6 address of the GGSN/P-GW for communication with the AAA server. | Ipv6 | Conditional  Notes 1 and 7 | |
| 32 | NAS-Identifier | Hostname of the GGSN/P-GW for communication with the AAA server. | String | Conditional  Note 1 | |
| 6 | Service-Type | Indicates the type of service for this user | Framed | Optional | |
| 7 | Framed Protocol | Indicates the type of protocol for this user | 7 (GPRS PDP Context) | Optional  Note 8 | |
| 8 | Framed-IP-Address | User Ipv4 address | Ipv4 | Conditional Note 3 | |
| 97 | Framed-Ipv6-Prefix | User Ipv6 prefix | Ipv6 | Conditional Note 3 | |
| 123 | Delegated-IPv6-Prefix | Delegated IPv6 prefix to the user | IPv6 | Conditional Note 9 | |
| 96 | Framed-Interface-Id | User Ipv6 Interface Identifier | Ipv6 | Conditional  Notes 3 and 4 | |
| 25 | Class | Received in the Access-Accept | String | Optional (Note 2) | |
| 30 | Called-Station-Id | Identifier for the target network | APN (UTF-8 encoded) | Mandatory | |
| 31 | Calling-Station-Id | This attribute is the identifier for the MS, and it shall be configurable on a per APN basis. | MSISDN in international format according to 3GPP TS 23.003 [40], UTF-8 encoded characters. (Note 6) | Optional | |
| 40 | Acct-Status-Type | Indicates the type of accounting request | Interim-Update | Mandatory | |
| 41 | Acct-Delay-Time | Indicates how many seconds the GGSN/P-GW has been trying to send this record for, and can be subtracted from the time of arrival on the AAA server to find the approximate time of the event generating this Accounting-Request | Second | Optional | |
| 42 | Acct-Input-Octets | GGSN/P-GW counted number of octets sent by the user for the IP-CAN bearer | 32 bit unsigned integer | Optional | |
| 43 | Acct-Output-Octets | GGSN/P-GW counted number of octets received by the user for the IP-CAN bearer | 32 bit unsigned integer | Optional | |
| 44 | Acct-Session-Id | User session identifier. | GGSN/P-GW IP address (Ipv4 or Ipv6) and Charging-ID concatenated in a UTF-8 encoded hexadecimal characters.  (Note 5) | Mandatory | |
| 45 | Acct-Authentic | Authentication method | RADIUS or LOCAL | Optional | |
| 46 | Acct-Session-Time | Duration of the session | Second | Optional | |
| 47 | Acct-Input-Packets | GGSN/P-GW counted number of packets sent by the user | Packet | Optional  (Note 10) | |
| 48 | Acct-Output-Packets | GGSN/P-GW counted number of packets received by the user | Packet | Optional  (Note 10) | |
| 52 | Acct-Input-Gigawords | It indicates how many times the Acct-Input-Octets counter has wrapped around 2^32 and is present if the Acct-Input-Octets counter has wrapped around 2^32. | 32 bit unsigned integer  See IETF RFC 2869 [116] | Conditional | |
| 53 | Acct-Output-Gigawords | It indicates how many times the Acct-Output-Octets counter has wrapped around 2^32 and is present if the Acct-Output-Octets counter has wrapped around 2^32. | 32 bit unsigned integer  See IETF RFC 2869 [116] | Conditional | |
| 61 | NAS-Port-Type | Port type for the GGSN/P-GW | As per RFC 2865 [38] | Optional | |
| 26/10415 | 3GPP Vendor-Specific | Sub-attributes according to subclause 16.4.7. | See subclause 16.4.7 | | Optional except sub-attribute 3 which is conditional |
| NOTE 1: Either NAS-IP-Address or NAS-Identifier shall be present.  NOTE 2: The presence of this attribute is conditional upon this attribute being received in the Access-Accept message  NOTE 3: Ipv4 and/or Ipv6 address/prefix attributes shall be present. The IP protocol version for end-user and network may be different.  NOTE 4: Included if the prefix alone is not unique for the user. This may be the case, for example, if a static Ipv6 address is assigned.  NOTE 5: The GGSN/P-GW IP address is the same one that is used in the CDRs generated by the GGSN/P-GW.  NOTE 6: There are no leading characters in front of the country code.  NOTE 7: Either Ipv4 or Ipv6 address attribute shall be present.  NOTE 8: Framed-Protocol value of 7 is used by both GGSN and P-GW when interworking with RADIUS AAA servers. When used for P-GW, it represents the IP-CAN bearer.  NOTE 9: Delegated IPv6 prefix shall be present if IPv6 prefix delegation is required from the external DN-AAA server.  NOTE 10: This information is not available in Rel-14 and subsequent releases up to the present release if the P-GW is split into a user plane node and control plane node according to 3GPP TS 29.244 [114]. | | | | | |

\*\*\* 7th Change \*\*\*

### 16.4.9 Disconnect Request (optionally sent from AAA server to GGSN/P-GW)

Table 9 describes the attributes of the Disconnect-Request message.

Table 9: The attributes of the Disconnect-Request message

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attr # | Attribute Name | Description | Content | Presence Requirement |
| 1 | User-Name | Username provided by the user (extracted from the PCO/APCO field received during PDN connection establishment) or PPP authentication phase (if PPP PDP type is used). If no username is available a generic username, configurable on a per APN basis, shall be present. If the User-Name has been sent in the Access-Accept message, this user-name shall be used in preference to the above | String | Optional |
| 8 | Framed-IP-Address | User Ipv4 address | Ipv4 | Conditional Note 2 |
| 97 | Framed-Ipv6-Prefix | User Ipv6 prefix | Ipv6 | Conditional Note 2 |
| 96 | Framed-Interface-Id | User Ipv6 Interface Identifier | Ipv6 | Conditional  Notes 1and 2 |
| 44 | Acct-Session-Id | User session identifier. | GGSN/P-GW IP address (Ipv4 or Ipv6) and Charging-ID concatenated in a UTF-8 encoded hexadecimal characters.  (Note 3) | Mandatory |
| 26/10415 | 3GPP Vendor-Specific | Sub-attributes according to subclause 16.4.7. | See subclause 16.4.7 | Optional |
| NOTE 1: Included if the prefix alone is not unique for the user. This may be the case, for example, if a static Ipv6 address is assigned.  NOTE 2: Either Ipv4 or Ipv6 address/prefix attribute shall be present. See subclause 16.3.4.  NOTE 3: The GGSN/P-GW IP address is the same one that is used in the CDRs created by the GGSN/P-GW. | | | | |

\*\*\* 8th Change \*\*\*

### 16a.4.1 AAR Command

The AAR command, defined in Diameter NASREQ (IETF RFC 4005 [67]), is indicated by the Command-Code field set to 265 and the ‘R’ bit set in the Command Flags field. It may be sent by the GGSN to a Diameter server, during Primary PDP Context activation only, in order to request user authentication and authorization. In the case of P-GW, the AAR may be sent upon reception of an initial access request (e.g. Create Session Request or Proxy Binding Update) message for a given APN to request user authentication and authorization.

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 bold marked AVPs in the message format indicate optional AVPs for Gi/Sgi, or modified existing AVPs. For Sgi, some of the optional 3GPP vendor-specific AVPs listed in the message format below are not applicable. See table 9a in subclause 16a.5 to see the list of vendor-specific AVPs that are applicable to the GGSN and the P-GW.

Message Format:

<AA-Request> ::= < Diameter Header: 265, REQ, PXY >

< Session-Id >

{ Auth-Application-Id }

{ Origin-Host }

{ Origin-Realm }

{ Destination-Realm }

{ Auth-Request-Type }

[ Destination-Host ]

[ NAS-Port ]

[ NAS-Port-Id ]

[ NAS-Port-Type ]

[ Origin-State-Id ]

[ Port-Limit ]

[ User-Name ]

[ User-Password ]

[ Service-Type ]

[ Authorization-Lifetime ]

[ Auth-Grace-Period ]

[ Auth-Session-State ]

[ Callback-Number ]

[ Called-Station-Id ]

[ Calling-Station-Id ]

[ Originating-Line-Info ]

[ Connect-Info ]

[ CHAP-Auth ]

[ CHAP-Challenge ]

\* [ Framed-Compression ]

[ Framed-Interface-Id ]

[ Framed-IP-Address ]

\* [ Framed-Ipv6-Prefix ]

\* [ Delegated-IPv6-Prefix ]

[ Framed-IP-Netmask ]

[ Framed-MTU ]

[ Framed-Protocol ]

\* [ Login-IP-Host ]

\* [ Login-Ipv6-Host ]

[ Login-LAT-Group ]

[ Login-LAT-Node ]

[ Login-LAT-Port ]

[ Login-LAT-Service ]

\* [ Tunneling ]

\* [ Proxy-Info ]

\* [ Route-Record ]

**[ 3GPP-IMSI]**

**[ External-Identifier]**

**[ 3GPP-Charging-ID ]**

**[ 3GPP-PDP-Type ]**

**[ 3GPP-CG-Address ]**

**[ 3GPP-GPRS-Negotiated-QoS-Profile ]**

**[ 3GPP-SGSN-Address ]**

**[ 3GPP-GGSN-Address ]**

**[ 3GPP-IMSI-MCC-MNC ]**

**[ 3GPP-GGSN-MCC-MNC ]**

**[ 3GPP-NSAPI ]**

**[ 3GPP-Selection-Mode ]**

**[ 3GPP-Charging-Characteristics ]**

**[ 3GPP-CG-Ipv6-Address ]**

**[ 3GPP-SGSN-Ipv6-Address ]**

**[ 3GPP-GGSN-Ipv6-Address ]**

**[ 3GPP-SGSN-MCC-MNC ]**

**[** 3GPP-User-Location-Info **]**

**[ 3GPP-RAT-Type ]**

**[ 3GPP-CAMEL-Charging-Info ]**

**[ 3GPP-Negotiated-DSCP ]**

**[ 3GPP-Allocate-IP-Type ]**

**[ TWAN-Identifier ]**

\* [ AVP ]

\*\*\* 9th Change \*\*\*

### 16a.4.2 AAA Command

The AAA command, defined in Diameter NASREQ (IETF RFC 4005 [67]), 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 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 ]

\*\*\* 10th Change \*\*\*

### 16a.4.3 ACR Command

The ACR command, defined in IETF RFC 6733 (Diameter Base) [111], is indicated by the Command-Code field set to 271 and the ‘R’ bit set in the Command Flags field. It is sent by the GGSN/P-GW to the Diameter server to report accounting information for a certain IP-CAN bearer (e.g. PDP context) or an IP-CAN session of a certain user.

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 bold marked AVPs in the message format indicate optional AVPs for Gi/Sgi, or modified existing AVPs. For Sgi, some of the optional 3GPP vendor-specific AVPs listed in the message format below are not applicable. See table 9a in subclause 16a.5 to see the ones that are applicable.

Message Format:

<AC-Request> ::= < Diameter Header: 271, REQ, PXY >

< Session-Id >

{ Origin-Host }

{ Origin-Realm }

{ Destination-Realm }

{ Accounting-Record-Type }

{ Accounting-Record-Number }

[ Acct-Application-Id ]

[ User-Name ]

[ Origin-State-Id ]

[ Destination-Host ]

[ Event-Timestamp ]

[ Acct-Delay-Time ]

[ NAS-Identifier ]

[ NAS-IP-Address ]

[ NAS-Ipv6-Address ]

[ NAS-Port ]

[ NAS-Port-Id ]

[ NAS-Port-Type ]

\* [ Class ]

[ Service-Type ]

[ Accounting-Input-Octets ]

[ Accounting-Input-Packets ]

[ Accounting-Output-Octets ]

[ Accounting-Output-Packets ]

[ Acct-Authentic ]

[ Accounting-Auth-Method ]

[ Acct-Session-Time ]

[ Acct-Tunnel-Connection ]

[ Acct-Tunnel-Packets-Lost ]

[ Callback-Id ]

[ Callback-Number ]

[ Called-Station-Id ]

[ Calling-Station-Id ]

\* [ Connection-Info ]

[ Originating-Line-Info ]

[ Authorization-Lifetime ]

[ Session-Timeout ]

[ Idle-Timeout ]

[ Port-Limit ]

[ Accounting-Realtime-Required ]

[ Acct-Interim-Interval ]

\* [ Filter-Id ]

\* [ NAS-Filter-Rule ]

\* [ Qos-Filter-Rule ]

[ Framed-Compression ]

[ Framed-Interface-Id ]

[ Framed-IP-Address ]

[ Framed-IP-Netmask ]

\* [ Framed-Ipv6-Prefix ]

[ Framed-Ipv6-Pool ]

\* [ Framed-Ipv6-Route ]

\* [ Delegated-IPv6-Prefix ]

[ Framed-IPX-Network ]

[ Framed-MTU ]

[ Framed-Pool ]

[ Framed-Protocol ]

\* [ Framed-Route ]

[ 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 ]

\* [ Tunneling ]

\* [ Proxy-Info ]

\* [ Route-Record ]

**[ 3GPP-IMSI]**

**[ External-Identifier]**

**[ 3GPP-Charging-ID ]**

**[ 3GPP-PDP-Type ]**

**[ 3GPP-CG-Address ]**

**[ 3GPP-GPRS-Negotiated-QoS-Profile ]**

**[ 3GPP-SGSN-Address ]**

**[ 3GPP-GGSN-Address ]**

**[ 3GPP-IMSI-MCC-MNC ]**

**[ 3GPP-GGSN-MCC-MNC ]**

**[ 3GPP-NSAPI ]**

**[ 3GPP-Selection-Mode ]**

**[ 3GPP-Charging-Characteristics ]**

**[ 3GPP-CG-Ipv6-Address ]**

**[ 3GPP-SGSN-Ipv6-Address ]**

**[ 3GPP-GGSN-Ipv6-Address ]**

**[ 3GPP-SGSN-MCC-MNC ]**

**[ 3GPP-IMEISV ]**

**[ 3GPP-RAT-Type ]**

**[ 3GPP-User-Location-Info ]**

**[ 3GPP-MS-Time-Zone ]**

**[ 3GPP-CAMEL-Charging-Info ]**

**[ 3GPP-Packet-Filter ]**

**[ 3GPP-Negotiated-DSCP ]**

**[ TWAN-Identifier ]**

**[ 3GPP-User-Location-Info-Time ]**

**\* [ 3GPP-Secondary-RAT-Usage ]**

\* [ AVP ]

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