**3GPP TSG-CT WG3 Meeting #115e C3-212583**

**E-Meeting, 14th – 23rd April 2021 (Revision of C3-212277)**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **29.061** | **CR** | **0533** | **rev** | **1** | **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:***  | Correction to Framed IP |
|  |  |
| ***Source to WG:*** | Ericsson |
| ***Source to TSG:*** | CT3 |
|  |  |
| ***Work item code:*** | 5GS\_Ph1-CT |  | ***Date:*** | 2021-03-22 |
|  |  |  |  |  |
| ***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 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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | For 3GPP-PDP-Type, Framed IP are not applicable to other type than IPv4, IPv6 or IPv4v6, e.g. value 4 Non-IP is not applicable upon the allocated IP address used as end point address for PtP tunneling based on UDP/IP, or PGW not performing UE IP address allocation for other SGi PtP tunnelling mechanisms. and for 5GC reusing above descriptions, Framed IP attributes are not applicable to value 5 Unstructured and value 6 Ethernet for the Ethernet PDU Session.Meanwhile when GGSN/PGW decide to request AAA server to allocate UE IP address, with 3GPP-Allocate -IP-Type value 1,2 or 3 included in the initial Access-Request message instead of allocate UE IP address from the local pool, GGSN/PGW cannot include Frame IP in the Access-Request message since UE IP address is not available yet. |
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| ***Summary of change:*** | In the Access-Request, Access-Accept, Accounting-Request, Disconnect Request messages table Note, add "If the 3GPP-PDP-Type is IPv4, IPv6 or IPv4v6" as the condition for "Ipv4 address and/or Ipv6 prefix attributes shall be present". Also adding the 3GPP-Allocate-IP-Type description in initial Access-Request and Access-Accept as Framed IP presence condition. |
|  |  |
| ***Consequences if not approved:*** | Missing the correct condition description in the table Notes, arousing wrong PGW, SMF, SMF+PGW-C implementation and interworking problems with DN-AAA server. |
|  |  |
| ***Clauses affected:*** | 16.4.1, 16.4.2, 16.4.3, 16.4.4, 16.4.8, 16.4.9 |
|  |  |
|  | **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 \*\*\*

### 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 | ConditionalNote 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 | ConditionalNote 2 |
| 4 | NAS-IP-Address | IPv4 address of the GGSN/P-GW for communication with the AAA server. | IPv4 | ConditionalNote 3 and 7 |
| 95 | NAS-IPv6-Address | IPv6 address of the GGSN/P-GW for communication with the AAA server. | IPv6 | ConditionalNote 3 and 7 |
| 32 | NAS-Identifier | Hostname of the GGSN/P-GW for communication with the AAA server. | String | ConditionalNote 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) | OptionalNote 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 | ConditionalNote 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 | ConditionalNote 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: If the 3GPP-PDP-Type is IPv4, IPv6, or IPv4v6, and the 3GPP-Allocate-IP-Type is not present or with IP Type value zero in the initial Access-Request, then the 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. |

\*\*\* 2nd 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) | OptionalNote 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 | ConditionalNote 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] | OptionalNote 7 |
| 100 | Framed-IPv6-Pool | Name of the IPv6 prefix pool for the specific APN | String | OptionalNote 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: If the 3GPP-PDP-Type is IPv4, IPv6, or IPv4v6, and the 3GPP-Allocate-IP-Type is present with IP Type value 1,2 or 3 in the initial Access-Request message, then the 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. |

\*\*\* 3rd 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 | ConditionalNotes 1 and 7 |
| 95 | NAS-IPv6-Address | GGSN/P-GW IPv6 address for communication with the AAA server. | IPv6 | ConditionalNotes 1 and 7 |
| 32 | NAS-Identifier | Hostname of the GGSN/P-GW for communication with the AAA server. | String | ConditionalNote 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) | OptionalNote 8 |
| 8 | Framed-IP-Address | User IPv4 address | IPv4 | Conditional Note 3 |
| 97 | Framed-IPv6-Prefix | User IPv6 Prefix  | IPv6 | ConditionalNote 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] | OptionalNote 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 messageNOTE 3: If the 3GPP-PDP-Type is IPv4, IPv6, or IPv4v6, 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. |

\*\*\* 4th 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 | ConditionalNotes 1 and 7 |
| 95 | NAS-IPv6-Address | IPv6 address of the GGSN/P-GW for communication with the AAA server.  | IPv6 | ConditionalNotes 1 and 7 |
| 32 | NAS-Identifier | Hostname of the GGSN/P-GW for communication with the AAA server. | String | ConditionalNote 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) | OptionalNote 8 |
| 8 | Framed-IP-Address | User IPv4 address | IPv4 | Conditional Note 3 |
| 97 | Framed-IPv6-Prefix | User IPv6 Prefix  | IPv6 | ConditionalNote 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] | OptionalNote 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 integerSee 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 integerSee 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: If the 3GPP-PDP-Type is IPv4, IPv6, or IPv4v6, 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]. |

\*\*\* 5th 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 | ConditionalNotes 1 and 7 |
| 95 | NAS-IPv6-Address | IPv6 address of the GGSN/P-GW for communication with the AAA server.  | IPv6 | ConditionalNotes 1 and 7 |
| 32 | NAS-Identifier | Hostname of the GGSN/P-GW for communication with the AAA server. | String | ConditionalNote 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) | OptionalNote 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 | ConditionalNotes 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 integerSee 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 integerSee 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 messageNOTE 3: If the 3GPP-PDP-Type is IPv4, IPv6, or IPv4v6, 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]. |

\*\*\* 6th 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 | ConditionalNotes 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: If the 3GPP-PDP-Type is IPv4, IPv6, or IPv4v6, 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. |

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