



## **Cisco ASR 5000 Series AAA and GTPP Interface Administration and Reference**

**Versions 12.0 and 12.1**

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# CONTENTS

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<b>About this Guide .....</b>	<b>vii</b>
Conventions Used.....	viii
Contacting Customer Support .....	x
<b>AAA Introduction and Overview.....</b>	<b>11</b>
Overview .....	12
Supported Products and License .....	13
Diameter Proxy.....	14
Supported Features .....	15
Diameter Server Selection for Load-balancing.....	15
Fire-and-Forget Feature .....	15
Realm-based Routing .....	16
Dynamic Route Addition .....	16
Dynamic Route Deletion.....	16
<b>AAA Interface Configuration.....</b>	<b>19</b>
Configuring RADIUS AAA Functionality .....	20
Configuring RADIUS AAA Functionality at Context Level.....	20
Verifying Your Configuration .....	22
Configuring Diameter AAA Functionality .....	23
Configuring Diameter Endpoint .....	23
Configuring Diameter AAA Functionality at Context Level.....	25
Verifying Your Configuration .....	26
Configuring Diameter Authentication Failure Handling .....	26
Configuring at Context Level .....	26
Configuring at AAA Group Level .....	27
Configuring System-Level AAA Functionality.....	28
Verifying your configuration .....	28
Configuring AAA Server Group for AAA Functionality .....	30
AAA Server Group Configuration.....	31
Verifying Your Configuration .....	31
Applying a AAA Server Group to a Subscriber .....	32
Verifying Subscriber Configuration.....	32
Applying a AAA Server Group to an APN .....	33
Verifying APN Configuration.....	33
Configuring the Destination Context Attribute .....	34
Verifying Your Configuration .....	35
<b>Verifying and Saving Your Configuration .....</b>	<b>37</b>
Verifying the Configuration .....	38
Feature Configuration .....	38
Service Configuration .....	39
Context Configuration .....	39
System Configuration .....	39
Finding Configuration Errors .....	40
Saving the Configuration.....	41
Saving the Configuration on the Chassis.....	42

<b>Managing and Monitoring the AAA Servers .....</b>	<b>45</b>
Managing the AAA Servers .....	46
Using the RADIUS Testing Tools.....	46
Testing a RADIUS Authentication Server.....	46
Testing a RADIUS Accounting Server.....	47
Monitoring AAA Status and Performance .....	48
Clearing Statistics and Counters .....	49
Session Recovery and AAA Statistics Behavior .....	49
<b>Diameter Attribute Definitions .....</b>	<b>51</b>
Diameter Dictionary Types .....	52
DPCA .....	52
DCCA .....	53
CSCF .....	53
Diameter AAA .....	54
Attributes.....	56
<b>RADIUS Attribute Definitions.....</b>	<b>375</b>
Dictionary Types.....	376
Attributes.....	378
Attribute Notes.....	814
RFC 2868 Tunneling Attributes .....	814
<b>GTPP Accounting Overview .....</b>	<b>815</b>
Overview.....	816
CDR Transport by GTPP .....	817
Path Protocol.....	818
GTPP Message Types .....	819
Usage of GTPP Header in Charging.....	820
Information Elements .....	821
GTPP Messages .....	822
Node Alive Request.....	822
Node Alive Response .....	823
Redirection Request .....	823
Redirection Response .....	824
Data Record Transfer Request.....	825
Information Elements in Data Record Transfer Request .....	825
Packet Transfer Command IE.....	825
Data Record Packet IE.....	826
Sequence Numbers of Released Packets IE.....	826
Sequence Numbers of Canceled Packets IE .....	827
Private Extension IE .....	828
Data Record Transfer Response .....	828
Handling Error Response Cause .....	829
GTPP Configuration.....	830
Charging Characteristics .....	831
GTPP Accounting Interface in ECS .....	833
Charging Record Generation.....	834
Standard GGSN Call Detail Records (G-CDRs) .....	834
G-CDR Format .....	834
Enhanced GGSN Call Detail Records (eG-CDRs).....	835
eG-CDR Format .....	835
PDN Gateway Call Detail Records (PGW-CDRs).....	835
PGW-CDR Format .....	835
Serving Gateway Call Detail Records (SGW-CDRs).....	835
SGW-CDR Format .....	835

Sample GTPP Configuration .....	836
Sample Configuration for GGSN/PGW .....	836
Sample Configuration for SGW .....	837
<b>G-CDR and Enhanced G-CDR Field Reference Tables .....</b>	<b>839</b>
CDR Fields Supported in G-CDRs.....	840
custom1 – custom4 Dictionaries.....	840
custom5 – custom7, custom9, custom12, custom14, custom15, custom17, custom19, custom20, and custom22 Dictionaries .....	842
standard, custom8, custom10, custom11, custom13, custom18, custom21, custom23 – custom29 Dictionaries.....	844
custom16 Dictionary.....	846
custom30 Dictionary.....	848
CDR Fields Supported in eG-CDRs.....	851
custom1 Dictionary.....	851
custom2 Dictionary.....	852
custom3 Dictionary.....	854
custom4 Dictionary.....	856
custom5 and custom9 Dictionaries .....	858
List of Traffic Data Volumes.....	860
List of Service Data Volumes .....	860
custom6 – custom8, custom14, custom15, custom17, custom20 Dictionaries .....	862
List of Traffic Data Volumes .....	864
List of Service Data Volumes .....	865
standard and custom10 Dictionaries .....	866
custom12 and custom19 Dictionaries .....	867
List of Traffic Data Volumes .....	869
List of Service Data Volumes .....	870
custom21 Dictionary.....	872
custom27 Dictionary.....	874
custom 30 Dictionary.....	876
custom 33 Dictionary.....	878
List of Service Data Volumes .....	881
<b>G-CDR and Enhanced G-CDR Field Descriptions .....</b>	<b>885</b>
CDR Fields.....	886
<b>P-CDR Field Reference Tables .....</b>	<b>897</b>
CDR Fields Supported in P-CDRs .....	898
Custom Dictionaries .....	898
<b>P-CDR Field Descriptions .....</b>	<b>903</b>
CDR Fields .....	904
<b>SGSN and Mobility Management Charging Detail Record Field Reference Tables .....</b>	<b>923</b>
CDR Fields Supported in S-CDRs .....	924
standard, custom1, custom2, custom4, custom5, custom7, custom9, custom12, custom14 – custom16, custom19 – custom22, custom24 – custom26, custom28 – custom30 Dictionaries .....	924
custom3 Dictionary.....	926
custom6 Dictionary.....	928
custom8 Dictionary.....	930
custom10 and custom11 Dictionaries .....	932
custom13 Dictionary.....	935
custom17 Dictionary.....	937
custom18 Dictionary.....	941
custom27 dictionary .....	943

CDR Fields Supported in S-SMO-CDRs .....	946
standard, custom1 – custom30 Dictionaries .....	946
CDR Fields Supported in S-SMT-CDRs .....	948
standard, custom1 – custom30 Dictionaries .....	948
CDR Fields Supported in M-CDR .....	950
standard, custom1 – custom5, custom7, custom9 – 12, and custom14 – custom30 Dictionaries .....	950
custom6 and custom13 Dictionaries .....	951
custom8 Dictionary .....	953
<b>S-CDR Field Descriptions .....</b>	<b>955</b>
CDR Fields .....	956
<b>SGW-CDR Field Reference Tables .....</b>	<b>965</b>
CDR Fields Supported in SGW-CDRs .....	966
custom6, custom11, and custom24 Dictionaries .....	966
List of Traffic Data Volumes .....	968
<b>SGW-CDR Field Descriptions .....</b>	<b>971</b>
CDR Fields .....	972
<b>WLAN CDR Field Reference Tables .....</b>	<b>991</b>
CDR Fields Supported in WLAN CDRs .....	992
standard, and custom1 - custom6 Dictionaries .....	992
<b>HDD Storage .....</b>	<b>997</b>
Overview .....	998
Benefits .....	999
Hardware Overview .....	1000
How HDD Works .....	1001
Deployment Scenarios .....	1003
HDD Configuration .....	1004
Configuring HDD .....	1004
Configuring EDR/UDR Parameters .....	1004
Viewing Statistics .....	1005
Pushing EDR/UDR Files Manually .....	1006
Retrieving EDR and UDR Files .....	1006
<b>AAA Engineering Rules .....</b>	<b>1007</b>
AAA Interface Rules .....	1008
<b>RADIUS Server State Behavior .....</b>	<b>1009</b>
Understanding RADIUS Server States and Commands .....	1010
Server States .....	1010
RADIUS Server Commands .....	1010
Server State Triggers .....	1012
<b>Switching CDRs .....</b>	<b>1015</b>
Switching CDRs from HDD to GSS .....	1016
LRSN Enabled .....	1016
LRSN Disabled .....	1017
Switching CDRs from GSS to HDD .....	1020
LRSN Enabled .....	1020
LRSN Disabled .....	1021
<b>Diameter Attribute Quick Reference .....</b>	<b>1025</b>
<b>RADIUS Attribute Quick Reference Tables .....</b>	<b>1027</b>

# About this Guide

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This document pertains to the features and functionality that run on and/or that are related to the Cisco® ASR 5000 Chassis, formerly the Starent Networks ST40.

# Conventions Used

The following tables describe the conventions used throughout this documentation.

Icon	Notice Type	Description
	Information Note	Provides information about important features or instructions.
	Caution	Alerts you of potential damage to a program, device, or system.
	Warning	Alerts you of potential personal injury or fatality. May also alert you of potential electrical hazards.
	Electro-Static Discharge (ESD)	Alerts you to take proper grounding precautions before handling a product.

Typeface Conventions	Description
Text represented as a <b>screen display</b>	This typeface represents displays that appear on your terminal screen, for example: <b>Login:</b>
Text represented as <b>commands</b>	This typeface represents commands that you enter, for example: <b>show ip access-list</b> This document always gives the full form of a command in lowercase letters. Commands are not case sensitive.
Text represented as a <b>command variable</b>	This typeface represents a variable that is part of a command, for example: <b>show card slot_number</b> slot_number is a variable representing the desired chassis slot number.
Text represented as menu or sub-menu names	This typeface represents menus and sub-menus that you access within a software application, for example: Click the <b>File</b> menu, then click <b>New</b>

Command Syntax Conventions	Description
{ <b>keyword</b> or <b>variable</b> }	Required keywords and variables are surrounded by grouped brackets. Required keywords and variables are those components that are required to be entered as part of the command syntax.

Command Syntax Conventions	Description
[ <b>keyword</b> or <b>variable</b> ]	Optional keywords or variables, or those that a user may or may not choose to use, are surrounded by square brackets.
	With some commands there may be a group of variables from which the user chooses one. These are called alternative variables and are documented by separating each variable with a vertical bar (also known as a pipe filter). Pipe filters can be used in conjunction with required or optional keywords or variables. For example: { <b>nonce</b>   <b>timestamp</b> } OR [ <b>count</b> <i>number_of_packets</i>   <b>size</b> <i>number_of_bytes</i> ]

# Contacting Customer Support

Use the information in this section to contact customer support.

**For New Customers:** Refer to the support area of <http://www.cisco.com> for up-to-date product documentation or to submit a service request. A valid username and password is required to this site. Please contact your local sales or service representative for additional information.

**For Existing Customers with support contracts through Starent Networks:** Refer to the support area of <https://support.starentnetworks.com/> for up-to-date product documentation or to submit a service request. A valid username and password is required to this site. Please contact your local sales or service representative for additional information.



**Important:** For warranty and repair information, please be sure to include the Return Material Authorization (RMA) tracking number on the outside of the package.

# Chapter 1

## AAA Introduction and Overview

---

This chapter provides the information on how to configure the AAA interface to enable authentication, authorization, and accounting (AAA) functionality for your core network service subscribers in a wireless carrier network.

This chapter provides information on basic AAA features. For information on product-specific AAA features, refer to the administration guide for the product that you are deploying.

# Overview

The Authentication, authorization, and accounting (AAA) subsystem on the chassis provides the basic framework to configure access control on your network. The AAA subsystem in core network supports Remote Authentication Dial-In User Service (RADIUS) and Diameter protocol based AAA interface support. The AAA subsystem also provides a wide range of configurations for AAA servers in groups, which in effect contain a series of RADIUS/Diameter parameters for each application. This allows a single group to define a mix of Diameter and RADIUS servers for the various application functions.

Although AAA functionality is available through AAA subsystem, the chassis provides onboard access control functionality for simple access control through subscriber/APN authentication methods.

AAA functionality provides capabilities to operator to enable authentication and authorization for a subscriber or a group of subscriber through domain or APN configuration. The AAA interface provides the following AAA support to a network service:

- **Authentication:** It is the method of identifying users, including login and password, challenge and response, messaging support, and encryption. Authentication is the way to identify a subscriber prior to being allowed access to the network and network services. An operator can configure AAA authentication by defining a list of authentication methods, and then applying that list to various interfaces.

All authentication methods, except for chassis-level authentication, must be defined through AAA configuration.

- **Authorization:** It is the method to provide access control, including authorization for a subscriber or domain profile. AAA authorization sends a set of attributes to the service describing the services that the user can access. These attributes determine the user's actual capabilities and restrictions.
- **Accounting:** Collects and sends subscriber usage and access information used for billing, auditing, and reporting, such as user identities, start and stop times, performed actions, number of packets, and number of bytes.

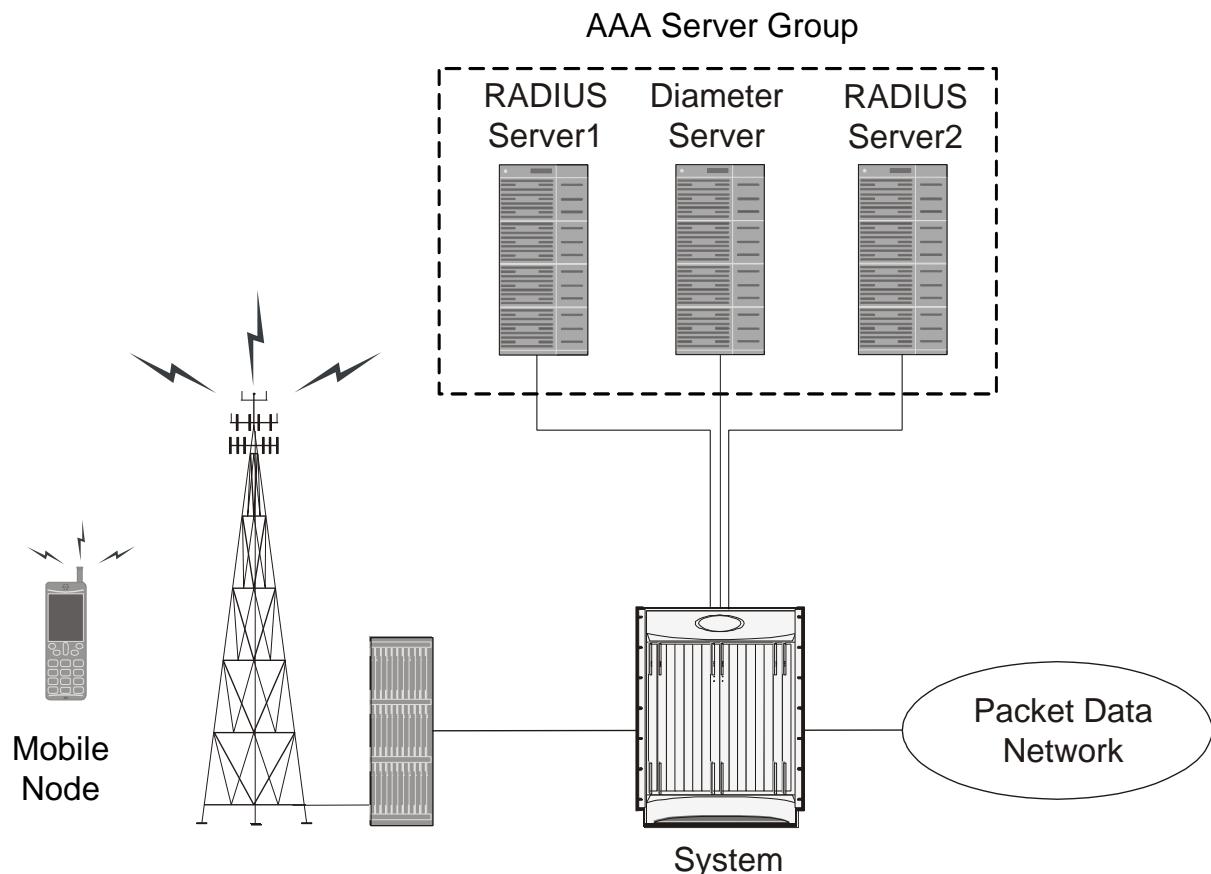
Accounting enables operator to analyze the services users are accessing as well as the amount of network resources they are consuming. Accounting records are comprised of accounting AVPs and are stored on the accounting server. This accounting information can then be analyzed for network management, client billing, and/or auditing.

Advantages of using AAA are:

- Higher flexibility for subscriber access control configuration
- Better accounting, charging, and reporting options
- Industry standard RADIUS and Diameter authentication

The following figure shows a typical AAA server group configuration that includes three AAA servers (RADIUS and Diameter).

Figure 1. AAA Server Group Configuration in a Core Network



## Supported Products and License

AAA interface support is available for all services running on the Cisco chassis.

**Important:** Information to configure product-specific AAA interfaces are provided in the respective Administration Guides.

Some of the features such as Prepaid Accounting and Diameter interface support are licensed features.

**Important:** Use of the AAA interface features requires that a valid license key be installed. Contact your local Sales or Support representative for information on how to obtain a license.

## Diameter Proxy

The proxy acts as an application gateway for Diameter. It gets the configuration information at process startup and decides which Diameter peer has to be contacted for each application. It establishes the peer connection if no peer connection already exists. Upon receiving the answer, it uses the Diameter session ID to identify to which application the message is intended.

Each PSC has a Diameter proxy identified by the IPv6 origin host address. If the number of configured origin hosts is lesser than the number of active PSCs, some (i.e. those number where no origin hosts associated with) PSCs will not activate Diameter processing at all, and instead notify administrators of the erroneous configuration with syslog/traps.

If the number of configured origin hosts is greater than the number of active PSCs, the application will automatically select which configured host is to be used per PSC.

# Supported Features

This section provides the list of features that are supported by RADIUS and Diameter.

## Diameter Server Selection for Load-balancing

Diameter load balancing implementation maintains a fixed number of servers active at all times for load balancing in case of failures. This can be done by selecting a server with lower weight and adding it to the set of active servers.

Consider the following requirements in the Diameter Endpoint configuration for load balancing:

- Endpoint configuration is needed to specify the minimum number of servers that needs to be active for the service.
- If any one of the servers in the current active group fails, one of the idle servers needs to be selected for servicing the new requests.
- New sessions should be assigned to idle servers with higher weight.
- New session should be assigned to idle servers with lower weight only if
  - The number of active servers are less than the minimum number of servers required for the service
  - Idle servers with higher priority are not available

For information on the commands used for configuring the load-balancing feature, refer to the *Command Line Interface Reference*.

## Fire-and-Forget Feature

The current release supports configuring secondary AAA accounting group for the APN. This supports the RADIUS Fire-and-Forget feature in conjunction with GGSN for secondary accounting (with different RADIUS accounting group configuration) to the RADIUS servers without expecting acknowledgement from the server, in addition to standard RADIUS accounting. This secondary accounting will be an exact copy of all the standard RADIUS accounting message (RADIUS Start / Interim / Stop) sent to the standard AAA RADIUS server.

This feature also supports configuring secondary AAA accounting group for the subscriber template. This supports the No-ACK RADIUS Targets feature in conjunction with PDSN and HA for secondary accounting (with different RADIUS accounting group configuration) to the RADIUS servers without expecting the acknowledgement from the server, in addition to standard RADIUS accounting. This secondary accounting will be an exact copy of all the standard RADIUS accounting message (RADIUS Start / Interim / Stop) sent to the standard AAA RADIUS server.

Typically, the request sent to the Radius Accounting Server configured under the AAA group with the CLI "radius accounting fire-and-forget" configured will not expect a response from the server. If there is a need to send the request to multiple servers, the accounting algorithm first-n will be used in the AAA group.

If the server is down, the request is sent to the next server in the group. If all the servers in the group are down, then the request is deleted.



**Important:** Please note that on-the-fly change in the configuration is not permitted. Any change in the configuration will have effect only for the new calls.

For information on the commands used for configuring this feature, refer to the *Command Line Interface Reference*.

## Realm-based Routing

In Release 12.0 and later releases, the Diameter routing logic has been modified to enable routing to destination hosts that are not directly connected to the Diameter clients like GGSN, MME, PGW, and that does not have a route entry configured. Message routing to the host is based on the realm of the host.

For a given session towards a Destination Host, all the messages belonging to the session will be routed through the same peer until the peer is down. If the peer goes down, for the subsequent messages failure handling mechanism will be triggered and the message will be sent using other available peers connected to the destination host.

## Dynamic Route Addition

Dynamic routes are added when a response to a diameter request message arrives with Origin-Host AVP. If there is no route entry corresponding to the Origin-Host, realm and peer, a new dynamic route entry is created and added to the table. This route entry will be flagged as Dynamic and a Path Cache entry. The following entries will be added to the dynamic route entry.

- Flag (Dynamic and Path-Cache)
- Host name (Corresponding to the Origin-Host from the response)
- Realm (Obtained from the session)
- Application id (Obtained from the session)
- Peer (From which the response was received)
- Weight (Inherit the weight of the realm-based route entry based on which the request was routed)

## Dynamic Route Deletion

The dynamic route will be deleted from the routing table in the following conditions:

- The peer associated with the route-entry is deleted.
- When the route is not used by any of the sessions for a given period of time.
- When the realm based route from which the dynamic route is derived, is deleted.

The route deletion can be accomplished by introducing a new CLI in the Diameter Endpoint configuration mode. This CLI allows configuring an expiry timeout based on which the route entry will be deleted.

For information on the commands used for configuring the realm-based routing feature, refer to the *Command Line Interface Reference*.



# Chapter 2

## AAA Interface Configuration

---

This chapter describes how to configure access control to network services, and the type of services available to subscribers once they have access. The authentication, authorization, and accounting (AAA) configuration described in this chapter provides the primary framework through which you can set up AAA functionality in your network for a service subscriber.

Procedures to configure and administer core network services are described in detail in the administration guide for the product that you are deploying. System-related configuration procedures are described in detail in the *System Administration Guide*. Before using the procedures in this chapter, it is recommended to refer the respective product administration guide and the *System Administration Guide*.

This chapter includes the following information:

- [Configuring RADIUS AAA Functionality](#)
- [Configuring Diameter AAA Functionality](#)
- [Configuring System-Level AAA Functionality](#)
- [Configuring AAA Server Group for AAA Functionality](#)
- [Configuring the Destination Context Attribute](#)

# Configuring RADIUS AAA Functionality

RADIUS-based AAA functionality must be configured at the context and system levels. This section describes how to configure the RADIUS-based AAA parameters at the context and system levels.

To configure RADIUS AAA functionality:

- Step 1** Configure RADIUS AAA functionality at context level as described in the [Configuring RADIUS AAA Functionality](#) section.
- Step 2** Configure system-level AAA parameters as described in the [Configuring System-Level AAA Functionality](#) section.
- Step 3** Save your configuration as described in the *Verifying and Saving Your Configuration* chapter.



**Important:** Commands used in the configuration examples in this section provide base functionality to the extent that the most common or likely commands and/or keyword options are presented. In many cases, other optional commands and/or keyword options are available. Refer to the *Cisco ASR 5000 Series Command Line Interface Reference* for complete information regarding all commands.

## Configuring RADIUS AAA Functionality at Context Level

This section describes how to configure context-level RADIUS parameters for subscriber authentication and accounting (optional). As noted in this reference, RADIUS-based AAA functionality can be configured within any context, even its own.



**Important:** This section provides minimum instructions to configure context-level AAA functionality that allows the system to process data sessions. Commands that configure additional context-level AAA properties are described in the *Understanding the System Operation and Configuration* chapter of the *Cisco ASR 5000 Series System Administration Guide*.



**Important:** Commands except `change-authorize-nas-ip`, `accounting prepaid`, `accounting prepaid custom`, and `accounting unestablished-sessions` used in this section, or in the *Understanding the System Operation and Configuration* chapter, are also applicable to support AAA server group for AAA functionality. For details on AAA server group functionality, see the [Configuring AAA Server Group for AAA Functionality](#) section.

To configure RADIUS AAA functionality at the context level use the following configuration:

```
configure
  context <context_name>
    radius server <ipv4/ipv6_address> key <shared_secret> [ max <value>
  ] [ oldports | port <tcp_port> ] [ priority <priority> ]
```

```

        radius [ mediation-device ] accounting server <ipv4/ipv6_address>
key <shared_secret> [ acct-on { enable | disable } ] [ acct-off { enable
| disable } ] [ max <msgs> ] [ oldports ] [ port <port_number> ] [
priority <priority> ] [ type standard ]

        radius attribute nas-identifier <identifier>

        radius attribute nas-ip-address address <primary_ipv4/ipv6_address>
[ backup <secondary_ipv4/ipv6_address> ]

        radius strip-domain [ authentication-only | accounting-only ]

        end

```

Notes:

- *Optional.* If you want to support more than 320 server configurations system-wide, in the Global Configuration Mode, use the following command:

```
aaa large-configuration
```

- <context\_name> must be the system context designated for AAA configuration.
- For information on GGSN-specific additional configurations using RADIUS accounting see the *Creating and Configuring APNs* section of the *Cisco ASR 5000 Series GGSN Administration Guide*.
- In this release, the configuration of NAS IP address with IPv6 prefix is currently not supported.
- <identifier> must be the name designated to identify the system in the Access Request message(s) it sends to the RADIUS server.
- *Optional.* Multiple RADIUS attribute dictionaries have been created for the system. Each dictionary consists of a set of attributes that can be used in conjunction with the system. As a result, users could take advantage of all of the supported attributes or only a subset. To specify the RADIUS attribute dictionary that you want to implement, in the Context Configuration Mode, use the following command:

```
radius dictionary { 3gpp | 3gpp2 | 3gpp2-835 | customXX | standard |
starent | starent-835 | starent-vs1 | starent-vs1-835 }
```

- *Optional.* Configure the system to support NAI-based authentication in the event that the system cannot authenticate the subscriber using a supported authentication protocol. To enable NAI-construction, in the Context Configuration Mode, use the following command:

```
aaa constructed-nai authentication [ encrypted ] password <password>
```

- *Optional.* If RADIUS is configured for GGSN service, the system can be configured to support NAI-based authentication to use RADIUS shared secret as password. To enable, in the Context Configuration Mode, use the following command:

```
aaa constructed-nai authentication use-shared-secret-password
```

If authentication type is set to allow-noauth or msid-auth and aaa constructed-nai authentication use-shared-secret-password is issued then the system will use RADIUS shared secret as password. In case the authentication type is msid-auth it will always send RADIUS shared secret as password by default in ACCESS-REQUEST.

- *Optional.* To configure the system to allow a user session even when all authentication servers are unreachable, in the Context Configuration Mode, use the following command. When enabled, the session is allowed without authentication. However, the accounting information is still sent to the RADIUS accounting server, if it is reachable.

```
radius allow authentication-down
```

- *Optional.* To configure the maximum number of times RADIUS authentication requests must be re-transmitted, in the Context Configuration Mode, use the following command:

```
radius max-transmissions <transmissions>
```

- *Optional.* If RADIUS is configured for PDSN service, to configure the accounting trigger options for R-P originated calls to generate STOP immediately or to wait for active-stop from old PCF on handoff, in the Context Configuration Mode, use the following command:

```
radius accounting rp handoff-stop { immediate | wait-active-stop }
```

For more information on configuring additional accounting trigger options for R-P generated calls for a PDSN service, refer to the **radius accounting rp** command in the *Cisco ASR 5000 Series Command Line Interface Reference*.

- *Optional.* To configure the system to check for failed RADIUS AAA servers, in the Context Configuration Mode, use the following command:

```
radius detect-dead-server { consecutive-failures <count> | keepalive | response-timeout <seconds> }
```

After a server's state is changed to "Down", the deadtime timer is started. When the timer expires, the server's state is returned to "Active". If both **consecutive-failures** and **response-timeout** are configured, then both parameters have to be met before a server's state is changed to "Down". For a complete explanation of RADIUS server states, refer to *RADIUS Server State Behavior* appendix.

- *Optional.* To configure the system to check for failed RADIUS accounting servers, in the Context Configuration Mode, use the following command:

```
radius accounting detect-dead-server { consecutive-failures <count> | response-timeout <seconds> }
```

After a server's state is changed to "Down", the deadtime timer is started. When the timer expires, the server's state is returned to "Active". If both **consecutive-failures** and **response-timeout** are configured, then both parameters have to be met before a server's state is changed to "Down". For a complete explanation of RADIUS server states, refer to *RADIUS Server State Behavior*.

- *Optional.* If required, users can configure the dynamic redundancy for HA as described in the *HA Redundancy for Dynamic Home Agent Assignment* chapter of the *Cisco ASR 5000 Series Home Agent Administration Guide*.

## Verifying Your Configuration

To verify your configurations:

In the Exec mode, enter the following command:

```
show configuration context <aaa_context_name>
```

The output displays a concise list of settings that you have configured for the context.

# Configuring Diameter AAA Functionality

This section describes how to configure the Diameter endpoints and system to use the Diameter servers for subscriber authentication and accounting (optional).

To configure Diameter AAA functionality:

- Step 1** Configure Diameter endpoint as described in the [Configuring Diameter Endpoint](#) section.
- Step 2** Configure Diameter context-level AAA parameters as described in the [Configuring Diameter AAA Functionality at Context Level](#) section.
- Step 3** Configure system-level AAA parameters as described in the [Configuring System-Level AAA Functionality](#) section.
- Step 4** Save your configuration as described in the *Verifying and Saving Your Configuration* chapter.



**Important:** Commands used in the configuration examples in this section provide base functionality to the extent that the most common or likely commands and/or keyword options are presented. In many cases, other optional commands and/or keyword options are available. Refer to the *Cisco ASR 5000 Series Command Line Interface Reference* for complete information regarding all commands.



**Important:** In releases prior to 12.0, the configuration of Diameter nodes and host strings like endpoint name, peer name, host name, realm name, and fqdn were case-sensitive. In 12.0 and later releases, all the Diameter related node IDs are considered case insensitive. This change applies to both the local configuration and communication with external nodes.

## Configuring Diameter Endpoint

Before configuring the Diameter AAA functionality you must configure the Diameter endpoint.

Use the following configuration example to configure Diameter endpoint:

```
configure

  context <context_name>

    diameter endpoint <endpoint_name>

      origin host <host_name> address <ipv4/ipv6_address> [ port
      <port_number> ] [ accept-incoming-connections ] [ address
      <ipv4/ipv6_address_secondary>]

      peer <peer_name> [ realm <realm_name> ] address
      <ipv4/ipv6_address> [ [ port <port_number> ] [ connect-on-application-
      access ] [ send-dpr-before-disconnect [ disconnect-cause
      <disconnect_cause> ] ] [ sctp ] ]+
```

```
end
```

Notes:

- *Optional*. To support Diameter proxy server on per-PAC/PSC or per-system basis, in the Global Configuration Mode, use the following command:

```
require diameter-proxy { multiple | single }
```

- <context\_name> must be the name of the system context designated for AAA configuration.

- *Optional*. To enable Diameter proxy for the endpoint, in the Diameter Endpoint Configuration Mode, use the following command:

```
use-proxy
```

- *Optional*. To set the realm for the Diameter endpoint, in the Diameter Endpoint Configuration Mode, use the following command:

```
origin realm <realm_name>
```

- <realm\_name> is typically a company or service name. The realm is the Diameter identity and will be present in all Diameter messages.

- *Optional*. To create an entry in the route table for the Diameter peer, in the Diameter Endpoint Configuration Mode, use the following command:

```
route-entry { [ host <host_name> ] [ peer <peer_id> ] [ realm <realm_name> ] } [ application credit-control ] [ weight <value> ]
```

- *Optional*. To set how the action after failure, or recovery after failure is performed for the route table, in the Diameter Endpoint Configuration Mode, use the following command:

```
route-failure { deadtime <seconds> | recovery-threshold percent <percent> | result-code <result_code> | threshold <counter> }
```

- *Optional*. To enable/disable the Transport Layer Security (TLS) support between Diameter client and Diameter server node, in the Diameter Endpoint Configuration Mode, use the following command:

```
tls { certificate <cert_string> | password <password> | privatekey <private_key> }
```

- Option. To set the connection timeout, in seconds, in the Diameter Endpoint Configuration Mode, use the following command:

```
connection timeout <timeout>
```

- *Optional*. To set the connection retry timeout, in seconds, in the Diameter Endpoint Configuration Mode, use the following command:

```
connection retry-timeout <retry_timeout>
```

- *Optional*. To set the number of Device Watchdog Requests (DWRs) to be sent before the connection with a Diameter endpoint is closed, in the Diameter Endpoint Configuration Mode, use the following command:

```
device-watchdog-request max-retries <retry_count>
```

- *Optional*. To set the maximum number of Diameter messages that any ACS Manager (ACSMgr)/Session Manager (SessMgr) may send to any one peer awaiting responses, in the Context Configuration Mode, use the following command:

```
max-outstanding <msgs>
```

- *Optional.* To set the response timeout for the Diameter endpoint, in seconds, in the Diameter Endpoint Configuration Mode, use the following command:

```
response-timeout <duration>
```

- *Optional.* To set the watchdog timeout for the Diameter endpoint, in seconds, in the Diameter Endpoint Configuration Mode, use the following command:

```
watchdog-timeout <duration>
```

## Configuring Diameter AAA Functionality at Context Level

There are context-level Diameter parameters that must be configured to provide AAA functionality for subscriber sessions. As noted in *Understanding the System Operation and Configuration* chapter of the *Cisco ASR 5000 Series System Administration Guide*, AAA functionality can be configured within any context, even its own.

This section describes how to configure the Diameter-based AAA parameters at the context level. To configure Diameter-based AAA parameters at the system level, see the [Configuring System-Level AAA Functionality](#) section.



**Important:** This section provides the minimum instruction set to configure context-level Diameter AAA functionality that allows the system to process data sessions. Commands that configure additional context-level AAA properties are provided in *Understanding the System Operation and Configuration* chapter of the *Cisco ASR 5000 Series System Administration Guide*.

To configure Diameter AAA functionality at the context level use the following configuration:

```
configure

context <context_name>

    diameter authentication endpoint <endpoint_name>
    diameter authentication server <host_name> priority <priority>
    diameter authentication dictionary <dictionary>
    diameter accounting endpoint <endpoint_name>
    diameter accounting server <host_name> priority <priority>
    diameter accounting dictionary <dictionary>
end
```

Notes:

- <context\_name> must be the name of the system context designated for AAA configuration.
- <endpoint\_name> must be the same Diameter endpoint name configured in the [Configuring Diameter Endpoint](#) section.
- *Optional.* To configure the number of retry attempts for a Diameter authentication request with the same server, if the server fails to respond to a request, in the Context Configuration Mode, use the following command:

```
diameter authentication max-retries <tries>
```

- *Optional.* To configure the maximum number of transmission attempts for a Diameter authentication request, in the Context Configuration Mode, use the following command. Use this in conjunction with the **max-retries <tries>** option to control how many servers will be attempted to communicate with.  
`diameter authentication max-transmissions <transmissions>`
- *Optional.* To configure how long the system must wait for a response from a Diameter server before re-transmitting the authentication request, in the Context Configuration Mode, use the following command:  
`diameter authentication request-timeout <duration>`
- *Optional.* To configure how many times a Diameter accounting request must be retried with the same server, if the server fails to respond to a request, in the Context Configuration Mode, use the following command:  
`diameter accounting max-retries <tries>`
- *Optional.* To configure the maximum number of transmission attempts for a Diameter accounting request, in the Context Configuration Mode, use the following command. You can use this in conjunction with the **max-retries tries** option to control how many servers will be attempted to communicate with.  
`diameter accounting max-transmissions <transmissions>`
- *Optional.* To configure how long the system will wait for a response from a Diameter server before re-transmitting the accounting request, in the Context Configuration Mode, use the following command:  
`diameter accounting request-timeout <duration>`

## Verifying Your Configuration

To verify your configurations:

In the Exec mode, enter the following command:

`show configuration context <aaa_context_name>`

The output displays a concise list of settings that you have configured for the context.

## Configuring Diameter Authentication Failure Handling

This section describes how to configure Diameter Authentication Failure Handling at the context level and the AAA group level.

### Configuring at Context Level

This section describes how to configure context-level error handling for EAP requests / EAP termination requests. Specific actions (continue, retry-and-terminate, or terminate) can be associated with each possible result-code. Ranges of result codes can be defined with the same action, or actions can be specific on a per-result code basis.

To configure Diameter Authentication Failure Handling at the context level use the following configuration:

```
configure
  context <context_name>
```

```

        diameter authentication failure-handling { authorization-request |
eap-request | eap-termination-request } { request-timeout action {
continue | retry-and-terminate | terminate } | result-code <result_code>
{ [ to <result_code> ] action { continue | retry-and-terminate |
terminate } } }

```

end

Notes:

- <context\_name> must be the name of the system source context designated for subscriber configuration.

## Configuring at AAA Group Level

This section describes how to configure error handling for EAP requests / EAP termination requests at the AAA group level. Specific actions (continue, retry-and-terminate, or terminate) can be associated with each possible result-code. Ranges of result codes can be defined with the same action, or actions can be specific on a per-result code basis.

To configure Diameter Authentication Failure Handling at the AAA group level use the following configuration example:

```

configure

context <context_name>

aaa group <group_name>

        diameter authentication failure-handling { authorization-request |
eap-request | eap-termination-request } { request-timeout action {
continue | retry-and-terminate | terminate } | result-code <result_code>
{ [ to <result_code> ] action { continue | retry-and-terminate |
terminate } } }

end

```

Notes:

- <context\_name> must be the name of the system source context designated for subscriber configuration.
- <group\_name> must be the name of the AAA group designated for AAA functionality within the specific context.

# Configuring System-Level AAA Functionality

There are system-level AAA parameters that must be configured in order to provide AAA functionality for subscriber and context-level administrative user sessions. As noted in *Understanding the System Operation and Configuration* chapter of the *Cisco ASR 5000 Series System Administration Guide*, AAA functionality can be configured within any context, even its own.



**Important:** Commands used in the configuration examples in this section provide base functionality to the extent that the most common or likely commands and/or keyword options are presented. In many cases, other optional commands and/or keyword options are available. Refer to the *Command Line Interface Reference* for complete information regarding all commands.

This procedure applies to both RADIUS and Diameter.

To configure system-level AAA functionality use the following configuration:

```
configure

aaa default-domain subscriber <domain_name>
aaa default-domain administrator <domain_name>
aaa last-resort context subscriber <context_name>
aaa last-resort context administrator <context_name>
aaa username-format { domain | username } { @ | % | - | \ | # | / }
end
```

Notes:

- <domain\_name> is the name of the domain, or context, to use for performing AAA functions in the subscriber session. For information on the role of the default domain in the context selection process can be found in the *Understanding the System Operation and Configuration* chapter of the *Cisco ASR 5000 Series System Administration Guide*.
- <context\_name> must be the name of the context to use for performing AAA functions in the subscriber session. Additional information on the role of the last-resort context in the context selection process can be found in the *Understanding the System Operation and Configuration* chapter of the *Cisco ASR 5000 Series System Administration Guide*.
- Up to six user name formats can be configured. The default format is username@domain.

## Verifying your configuration

To verify your configuration:

In the Exec mode, enter the following command:

```
show configuration context <context_name>
```

In the output, verify the AAA settings that you have configured in this user session.

# Configuring AAA Server Group for AAA Functionality

In addition to the AAA configurations, a AAA server group feature can be configured at the context-level to manage subscriber authentication and accounting through configuring AAA servers into groups.

In general, 128 AAA Server IP address/port per context can be configured on the system and the system selects servers from this list depending on the server selection algorithm (round robin, first server). Instead of having a single list of servers per context, this feature provides the ability to configure multiple server groups. Each server group, in turn, consists of a list of servers.

This feature works in the following way:

- All authentication/accounting servers configured at the context-level are treated as part of a server group named “default”. This default server group is available to all subscribers in that context through the realm (domain)/APN without any additional configuration.
- It provides a facility to create “user defined” AAA server groups, as many as 799 (excluding “default” server group), within a context. Any of the user-defined AAA server groups are available for assignment to a subscriber through the realm (domain)/APN configuration within that context.
- Subscribers/services/APNs/etc. are bound to a AAA group, which serves to define what Diameter/RADIUS server will be used for each AAA function (authentication, accounting, charging, and so on). Based on the request type the RADIUS or Diameter protocol type is selected to handle the AAA requests to be sent to the respective server.

AAA server group configuration is performed at the context-level. Different subscribers may use the same AAA context, but different AAA server groups only. Server configuration defined in the subscriber profile/APN template supersedes the servers or server groups configuration defined in context mode.

AAA server groups are assigned to the subscriber through realm (domain) configuration for all services. For GGSN service AAA server groups can be assigned to the subscriber through APN configuration also.

To configure AAA Server Group for AAA functionality:

**Step 1** Configure the AAA Server Group as described in the [AAA Server Group Configuration](#) section.

- Apply the AAA Server Group to subscriber as described in the [Applying a AAA Server Group to a Subscriber](#) section.  
—OR—
- Apply the AAA server-group to an APN as described in the [Applying a AAA Server Group to an APN](#) section.

**Step 2** Save your configuration as described in the *Verifying and Saving Your Configuration* chapter.



**Important:** Commands used in the configuration examples in this section provide base functionality to the extent that the most common or likely commands and/or keyword options are presented. In many cases, other optional commands and/or keyword options are available. Refer to the *Cisco ASR 5000 Series Command Line Interface Reference* for complete information regarding all commands.

# AAA Server Group Configuration

This section describes how to configure the context to use a group of AAA servers for subscriber authentication and accounting through subscriber/realm (domain)/APN configuration.

There are context-level AAA parameters that must be configured in order to provide AAA server group functionality for subscriber sessions.



**Important:** This section provides the minimum instruction set for configuring a AAA server group for AAA functionality. Commands that configure other properties of this functionality are provided in the *Cisco ASR 5000 Series Command Line Interface Reference*.

To configure a AAA server group use the following configuration:

```
configure
  context <context_name>
    aaa group <group_name>
  end
```

Notes:

- Up to 128 authentication and/or accounting servers can be configured per AAA server group. A maximum of 1600 servers can be configured system-wide regardless of the number of groups unless **aaa large-configuration** is enabled.
- Optional.* If you want to support more than 64 server groups system-wide, in the Global Configuration Mode, use the following command:  
**aaa large-configuration**
  - <context\_name>** must be the name of the system context designated for AAA functionality configuration.
  - <group\_name>** must be the name of the AAA group designated for AAA functionality within the specific context. A total of 800 server groups can be configured system-wide including default server-group unless **aaa large-configuration** is enabled.
- The same AAA server with IP address and port number can be configured with multiple AAA server groups within a context.
- To configure and verify RADIUS authentication and accounting servers and parameters within the AAA server group, refer to the [Configuring RADIUS AAA Functionality](#) section.
- To configure and verify Diameter authentication and accounting servers and parameters within the AAA server group, refer to the [Configuring Diameter AAA Functionality](#) section.

## Verifying Your Configuration

To verify your configuration:

**Step 1** Change to the context in which the AAA server group was configured by entering the following command:

## ■ Configuring AAA Server Group for AAA Functionality

```
context <context_name>
```

**Step 2** Display the context's configuration by entering the following command:

```
show configuration context <context_name>
```

**Step 3** In the output verify the server group's configuration.



**Important:** The “default” server group in a context is applicable to all subscribers/APNs within that context by default.

## Applying a AAA Server Group to a Subscriber

The following procedure assumes that a domain alias was previously configured as described in *Creating Contexts* section of the *Cisco ASR 5000 Series System Administration Guide*.

To apply AAA server group to a subscriber use the following configuration example:

```
configure

context <context_name>

subscriber name <subscriber_name>

aaa group <group_name>

end
```

Notes:

- <context\_name> must be the name of the system source context designated for subscriber configuration.
- <sub\_name> must be the name of the subscriber template configured as the default template for the domain. For more information on creating contexts, refer to the *Creating Contexts* section of the *System Element Configuration Procedures* chapter in the *Cisco ASR 5000 Series System Administration Guide*.
- <group\_name> must be the name of the AAA server group designated for AAA functionality within the context as described in the [AAA Server Group Configuration](#) section.

## Verifying Subscriber Configuration

**Step 1** Change to the context in which the AAA server group was configured by entering the following command:

```
context <context_name>
```

**Step 2** Display the subscriber's configuration by entering the following command:

```
show subscribers configuration username <subscriber_name>
```

**Step 3** In the output verify the subscriber's configuration.

## Applying a AAA Server Group to an APN

After configuring a AAA server group at context-level, an APN within the same context can be configured to use the user-defined server group.

Use the following configuration example to apply a user-defined AAA server group functionality to a previously configured APN within the same context.

```
configure
  context <context_name>
    apn <apn_name>
      aaa group <group_name>
    end
```

Notes:

- *<group\_name>* must be the name of the AAA server group previously configured for AAA functionality in a specific context as described in the [AAA Server Group Configuration](#) section.

## Verifying APN Configuration

**Step 1** Change to the context in which the AAA server group was configured by entering the following command:

```
context <context_name>
```

**Step 2** Display the APN's configuration by entering the following command:

```
show apn name <apn_name>
```

**Step 3** In the output verify the APN's configuration.

# Configuring the Destination Context Attribute

Once a user has been authenticated, a AAA attribute is returned in the access-accept message that contains the name of the destination context where the subscriber will egress from. For RADIUS-based subscribers, this is the SN-VPN-NAME attribute, or SN1-VPN-NAME attribute in some RADIUS dictionaries.

The system supports configuring subscriber profiles locally within a context though subscriber templates or on a RADIUS server. Subscribers configured on the system are configured within the contexts they were created. In the *Understanding the System Operation and Configuration* chapter of the *System Administration Guide*, the role of subscriber default, which is automatically configured for each context, and realm-based subscriber templates, which serves as a default subscriber template for users whose domain portion of their user name matches a domain alias within a context, was discussed. The role of these special subscriber templates is to provide a set of default attributes that may be used to populate any missing values for an authenticated RADIUS-based subscriber. The parameter that would contain this attribute value is called the IP context-name.

Further, it was explained that these attributes must be configured manually for both the subscriber default and any realm-based subscriber template created.

One of the rules that must be configured is a parameter that allows subscriber data traffic to be routed between source and destination contexts. Use the following example configuration to configure that rule.

---

 **Important:** Commands used in the configuration example in this section provide base functionality to the extent that the most common or likely commands and/or keyword options are presented. In many cases, other optional commands and/or keyword options are available. Refer to the *Cisco ASR 5000 Series Command Line Interface Reference* for complete information regarding all commands.

---

**configure**

```
  context <context_name>
    subscriber name default
      ip context-name <destination_context_name>
    end
```

Notes:

- <context\_name> must be the name of the system source context designated for Default subscriber configuration.
- <destination\_context\_name> must be the name of the destination context configured on the system containing the interfaces through which session traffic is routed.
- The “ip context-name” parameter in the subscriber profiles configured on the system corresponds to the SN-VPN-NAME and SN1-VPN-NAME RADIUS attributes.
- Configure the default subscriber in any other configured source contexts.

## Verifying Your Configuration

To verify your global AAA configurations:

In the Exec mode, use the following command:

**show configuration**

The output displays all the settings that you have configured in this user session. Verify the default-domain, last-resort, and username-format settings.



# Chapter 3

## Verifying and Saving Your Configuration

---

This chapter describes how to save your system configuration.

# Verifying the Configuration

You can use a number of commands to verify the configuration of your feature, service, or system. Many are hierarchical in their implementation and some are specific to portions of, or specific lines in, the configuration file.

## Feature Configuration

In many configurations, you have to set and verify specific features. An example includes IP address pool configuration. Using this example, enter the following commands to verify proper feature configuration:

Enter the following command to display the IP address pool configuration:

**show ip pool**

The output from this command should look similar to the sample shown below. In this example, all IP pools were configured in the *ispl* context.

```
context : ispl:
+----Type: (P) - Public (R) - Private
| (S) - Static (E) - Resource
|
| +----State: (G) - Good (D) - Pending Delete (R)-Resizing
|| |
|| +---Priority: 0..10 (Highest (0) .. Lowest (10))
|| |
|| +--Busyout: (B) - Busyout configured
|| |
----- vvvvvv Pool Name Start Address Mask/End Address Used Avail
----- -----
PG00 ipsec 12.12.12.0 255.255.255.0 0 254 PG00
pool1 10.10.0.0 255.255.0.0 0 65534 SG00
vpnpool 192.168.1.250 192.168.1.254 0 5 Total Pool Count: 5
```



**Important:** To configure features on the system, use the *show* commands specifically for these features. Refer to the *Cisco Systems ASR 5000 Command Line Interface Reference* for more information.

## Service Configuration

Verify that your service was created and configured properly by entering the following command:

**show <service\_type><service\_name>**

The output is a concise listing of the service parameter settings similar to the sample displayed below. In this example, a P-GW service called *pgw* is configured.

```
Service name : pgw1
Service-Id : 1
Context : test1
Status : STARTED
Restart Counter : 8
EGTP Service : egtp1
LMA Service : Not defined
Session-Delete-Delay Timer : Enabled
Session-Delete-Delay timeout : 10000(msecs)
PLMN ID List : MCC: 100, MNC: 99
Newcall Policy : None
```

## Context Configuration

Verify that your context was created and configured properly by entering the following command:

**show context name <name>**

The output shows the active context. Its ID is similar to the sample displayed below. In this example, a context named *test1* is configured.

Context Name	ContextID	State
test1	2	Active

## System Configuration

Verify that your entire configuration file was created and configured properly by entering the following command:

**show configuration**

This command displays the entire configuration including the context and service configurations defined above.

## Finding Configuration Errors

Identify errors in your configuration file by entering the following command:

**show configuration errors**

This command displays errors it finds within the configuration. For example, if you have created a service named “service1”, but entered it as “srv1” in another part of the configuration, the system displays this error.

You must refine this command to specify particular sections of the configuration. Add the **section** keyword and choose a section from the help menu:

**show configuration errors section ggsn-service**

or

**show configuration errors section aaa-config**

If the configuration contains no errors, an output similar to the following is displayed:

```
#####
Displaying Global
AAA-configuration errors
#####
Total 0 error(s) in this section !
```

# Saving the Configuration

Save system configuration information to a file locally or to a remote node on the network.



**Caution:** Prior to loading 12.2, we recommend that copies of the original configuration file be made and stored (with unique release-identifying titles) both in the Flash and off the chassis. Configuration files created and saved in release 12.2 cannot be shared across multiple chassis due to a change in the encryption algorithm for passwords and secrets. These 12.2 changes modify encrypted data in the configuration file so that it cannot be recognized by previous software builds. If it is necessary to revert to a previous build, the chassis must be booted with the copy of the original configuration file. If this copy is not available, then the chassis will need to be loaded as if it is a new chassis.

Files saved locally can be stored in the CompactFlash or a PCMCIA memory card on the SMC. Files that are saved to a remote network node can be transmitted through FTP or TFTP.

# Saving the Configuration on the Chassis

These instructions assume that you are at the root prompt for the Exec mode:

```
[local]host_name#
```

To save your current configuration, enter the following command:

```
save configuration url [-redundant] [-noconfirm] [showsecrets] [verbose]
```

Table 1. Command Syntax for Saving the Configuration

Keyword/Variable	Description
url	<p>Specifies the path and name to which the configuration file is to be stored. <i>url</i> may refer to a local or a remote file. <i>url</i> must be entered using one of the following formats:</p> <ul style="list-style-type: none"> <li>• { /flash   /pcmcia1   /pcmcia2 } [ /dir ] /file_name</li> <li>• file:{ /flash   /pcmcia1   /pcmcia2 } [ /dir ] /file_name</li> <li>• tftp:// { ipaddress   host_name [ :port# ] } [ /directory ] /file_name</li> <li>• ftp:// { username [ :pwd ] @ } { ipaddress   host_name } [ :port# ] [ /directory ] /file_name</li> <li>• sftp:// { username [ :pwd ] @ } { ipaddress   host_name } [ :port# ] [ /directory ] /file_name</li> </ul> <p>/flash corresponds to the CompactFlash on the SMC.  /pcmcia1 corresponds to PCMCIA slot 1.  /pcmcia2 corresponds to PCMCIA slot 2.  ipaddress is the IP address of the network server.  host_name is the network server's <i>hostname</i>.  port# is the network server's logical port number. Defaults are: <ul style="list-style-type: none"> <li>• tftp: 69 - data</li> <li>• ftp: 20 - data, 21 - control</li> <li>• sftp: 115 - data</li> </ul> Note: host_name can only be used if the <b>networkconfig</b> parameter is configured for DHCP and the DHCP server returns a valid nameserver.dn  username is the username required to gain access to the server if necessary.  password is the password for the specified username if required.  /directory specifies the directory where the file is located if one exists.  /file_name specifies the name of the configuration file to be saved.  Note: Configuration files should be named with a .cfg extension.</p>
-redundant	<p>Optional: This keyword directs the system to save the CLI configuration file to the local device, defined by the url variable, and then automatically copy that same file to the like device on the Standby SMC, if available.</p> <p>Note: This keyword will only work for like local devices that are located on both the active and standby SMCs. For example, if you save the file to the /pcmcia1 device on the active SMC, that same type of device (a PC-Card in Slot 1 of the standby SMC) must be available. Otherwise, a failure message is displayed.</p> <p>Note: When saving the file to an external network (non-local) device, the system disregards this keyword.</p>

Keyword/Variable	Description
-noconfirm	Optional: Indicates that no confirmation is to be given prior to saving the configuration information to the specified filename (if one was specified) or to the currently active configuration file (if none was specified).
showsecrets	Optional: This keyword saves the CLI configuration file with all passwords in plain text, rather than their default encrypted format.
verbose	Optional: Specifies to display every parameter that is being saved to the new configuration file.



**Important:** The **-redundant** keyword is only applicable when saving a configuration file to local devices. This command does not synchronize the local file system. If you have added, modified, or deleted other files or directories to or from a local device for the active SMC, you must synchronize the local file system on both SMCs.

To save a configuration file called *system.cfg* to a directory that was previously created called *cfgfiles* on the CompactFlash in the SMC, enter the following command:

```
save configuration /flash/cfgfiles/system.cfg
```

To save a configuration file called *simple\_ip.cfg* to a directory called *host\_name\_configs*, using an FTP server with an IP address of *192.168.34.156*, on which you have an account with a username of *administrator* and a password of *secure*, use the following command:

```
save configuration
ftp://administrator:secure@192.168.34.156/host_name_configs/
simple_ip.cfg
```

To save a configuration file called *init\_config.cfg* to the root directory of a TFTP server with a hostname of *config\_server*, enter the following command:

```
save configuration tftp://config_server/init_config.cfg
```



# Chapter 4

## Managing and Monitoring the AAA Servers

---

This chapter provides information for managing and monitoring the AAA server status and performance using the commands found in the Command Line Interface (CLI). These command have many related keywords that allow them to provide useful information on all aspects of the AAA interface activity and status.

The selection of keywords described in this chapter is intended to provided the most useful and in-depth information for monitoring AAA managers, interface, and servers on the system. For additional information on these command keywords, refer to the *Cisco ASR 5000 Series Command Line Interface Reference*.

In addition to the CLI, the system supports the sending of Simple Network Management Protocol (SNMP) traps that indicate status and alarm conditions. Refer to the *Cisco ASR 5000 Series SNMP MIB Reference* for a detailed listing of these traps.

This chapter includes the following sections:

- [Managing the AAA Servers](#)
- [Monitoring AAA Status and Performance](#)
- [Clearing Statistics and Counters](#)

# Managing the AAA Servers

This section provides information and instructions for using the system Command Line Interface (CLI) for troubleshooting the network reachability issues for AAA servers that may arise during system operation.

The following topics are discussed in this section:

- [Using the RADIUS Testing Tools](#)

## Using the RADIUS Testing Tools

The CLI provides a mechanism for testing network connectivity with and configuration of RADIUS authentication and accounting servers. This functionality can be extremely useful in determining the accuracy of the system's RADIUS configuration, the configuration of the subscriber profile on the RADIUS server, and troubleshooting the server's response time.

### Testing a RADIUS Authentication Server

When used to test a RADIUS authentication server, the tool generates an authentication request message for a specific user name.



**Important:** The user name must already be configured on the RADIUS authentication server prior to executing the test.

To execute the RADIUS authentication test tool, in the Exec mode, use the following command:

```
radius test authentication { all | radius group <group_name> | server <server_name> port <server_port> } <user_name> <password>
```

Notes:

- **all** specifies that all configured RADIUS authentication servers be tested.
- **radius group <group\_name>** specifies the configured RADIUS authentication servers in a RADIUS server group named <group\_name> for server group functionality.
- **<server\_name>** specifies the IP address of a specific RADIUS authentication server to test.
- **<server\_port>** specifies the TCP port over that the system should use when communicating with the RADIUS authentication server to test.
- **<user\_name>** specifies a username that is supplied to the RADIUS server for authentication.
- **<password>** specifies the password associated with the username that is supplied to the RADIUS server for authentication.

The following is a sample of this command's output for a successful response when testing a RADIUS authentication server with an IP address of 192.168.250.150 on port 1812.

```
Authentication from authentication server 192.168.250.150, port 1812
Authentication Success: Access-Accept received
Round-trip time for response was 8.8 ms
```

## Testing a RADIUS Accounting Server

When used to test a RADIUS accounting server, the tool generates an accounting start/stop pair for a specific username.



**Important:** The user name must already be configured on the RADIUS authentication server prior to executing the test.

To execute the RADIUS authentication test tool, enter the following command:

```
radius test accounting { all | radius group <group_name> | server
<server_name> port <server_port> } <user_name>
```

Notes:

- **all** specifies that all configured RADIUS accounting servers be tested.
- **radius group <group\_name>** specifies the configured RADIUS authentication servers in a RADIUS server group named **<group\_name>** for server group functionality.
- **<server\_name>** specifies the IP address of a specific RADIUS accounting server to test.
- **<server\_port>** specifies the TCP port over that the system should use when communicating with the RADIUS accounting server to test.
- **<user\_name>** specifies a username that is supplied to the RADIUS server for accounting.

The following is a sample of this command's output for a successful response when testing a RADIUS accounting server with an IP address of 192.168.1.102 on port 1813.

```
RADIUS Start to accounting server 192.168.1.102, port 1813
Accounting Success: response received
Round-trip time for response was 554.6 ms
```

```
RADIUS Stop to accounting server 192.168.1.102, port 1813
Accounting Success: response received
Round-trip time for response was 85.5 ms
```

# Monitoring AAA Status and Performance

This section describes the commands used to monitor the status of AAA servers in the service. Output descriptions for most of the commands are available in the *Cisco ASR 5000 Series Statistics and Counters Reference*.

To do this:	Enter this command:
View AAA Manager statistics	<b>show session subsystem facility aaamgr all</b>
<b>View AAA and RADIUS Counters</b>	
Display Local AAA Counters	
View Local AAA counters for the current context	<b>show aaa local counters</b>
Display RADIUS Server States	
 <b>Important:</b> These commands can display 10 state transition histories of RADIUS accounting and authentication servers (Active/Not responding/Down States). For explanation of RADIUS server states, refer to the <i>RADIUS Server State Behavior Appendix</i> .	
View RADIUS accounting server states	<b>show radius accounting servers detail</b>
View RADIUS authentication server states	<b>show radius authentication servers detail</b>
Display RADIUS Server Group Server States	
 <b>Important:</b> RADIUS Server Group functionality is a license controlled feature. A valid feature license must be installed prior to configuring RADIUS group for AAA functionality. If you have not previously purchased this enhanced feature, contact your sales representative for more information. For explanation of RADIUS server states, refer to the <i>RADIUS Server State Behavior Appendix</i> .	
View RADIUS authentication server group server states for a specific group	<b>show radius authentication servers radius group &lt;group_name&gt; detail</b>
View RADIUS accounting server group server states for a specific group	<b>show radius accounting servers radius group &lt;group_name&gt; detail</b>
Display RADIUS Protocol Counters	
View cumulative RADIUS protocol counters	<b>show radius counters all</b>
View RADIUS protocol counter summary of RADIUS authentication and accounting	<b>show radius counters summary</b>

## Clearing Statistics and Counters

It may be necessary to periodically clear statistics and counters in order to gather new information. The system provides the ability to clear statistics and counters based on their grouping (PPP, MIPHA, MIPFA, etc.).

Statistics and counters can be cleared using the CLI **clear** commands. For detailed information on using this command, refer to the *Cisco ASR 5000 Series Command Line Interface Reference*.

## Session Recovery and AAA Statistics Behavior

After a Session Recovery operation, some statistics/counters, such as those collected and maintained on a per manager basis (AAA Manager, Session Manager, etc.) are in general not recovered, only accounting/billing related information is checkpointed/recovered.

For more information, refer to the *Cisco ASR 5000 Series System Administration Guide*.



# Chapter 5

## Diameter Attribute Definitions

---

This chapter presents Diameter attribute definitions.

For the quick reference table, see the *Diameter Attribute Quick Reference* appendix.

# Diameter Dictionary Types

## DPCA

To configure the Diameter dictionary for Policy Control Configuration, use the following configuration:

```
configure

  context <context_name>

    ims-auth-service <ims_auth_service_name>

      policy-control

        diameter dictionary { Standard | dPCA-custom1 | dPCA-custom10 |
dPCA-custom11 | dPCA-custom12 | dPCA-custom13 | dPCA-custom14 | dPCA-custom15 |
dPCA-custom16 | dPCA-custom17 | dPCA-custom18 | dPCA-custom19 | dPCA-custom2 |
dPCA-custom20 | dPCA-custom3 | dPCA-custom4 | dPCA-custom5 | dPCA-custom6 |
dPCA-custom7 | dPCA-custom8 | dPCA-custom9 | gxa-3gpp2-standard | gxc-standard |
pdsn-ty | r8-gx-standard | std-pdsn-ty | ty-plus | ty-standard }

      end
```

Dictionary	Description
Standard	Specifies standard attributes for the Rel 6 Gx interface.
dPCA-custom1...dPCA-customn	Custom-defined dictionaries.
gxa-3gpp2-standard	Specifies standard Gxa 3GPP2 Standard attributes.
gxc-standard	Specifies Gxc Standard attributes.
pdsn-ty	Specifies the standard attributes for the PDSN Ty interface.
r8-gx-standard	Specifies standard R8 Gx attributes.
std-pdsn-ty	Specifies standard attributes for the Ty interface.
ty-plus	Specifies customer-specific enhanced attributes for the Ty interface.
ty-standard	Specifies standard Ty attributes.



**Important:** For information on custom-defined dictionaries, please contact your local service representative.

## DCCA

To configure the DCCA dictionary for Active Charging service, use the following configuration:

**configure**

```
active-charging service <acs_service_name>
```

```
    credit-control
```

```
        diameter dictionary { dcca-custom1 | dcca-custom10 | dcca-custom11 |
dcca-custom12 | dcca-custom13 | dcca-custom14 | dcca-custom15 | dcca-custom16 |
dcca-custom17 | dcca-custom18 | dcca-custom19 | dcca-custom2 | dcca-custom20 |
dcca-custom21 | dcca-custom22 | dcca-custom23 | dcca-custom24 | dcca-custom25 |
dcca-custom26 | dcca-custom27 | dcca-custom28 | dcca-custom29 | dcca-custom3 |
dcca-custom30 | dcca-custom4 | dcca-custom5 | dcca-custom6 | dcca-custom7 |
dcca-custom8 | dcca-custom9 | standard }
```

```
    end
```

Dictionary	Description
dcca-custom1 ... dcca-customn	Custom-defined dictionaries.
standard	Specifies standard attributes for the Gy interface.



**Important:** For information on custom-defined dictionaries, please contact your local service representative.

## CSCF

In Star OS 8.1 and later releases, to configure the Diameter Policy Control dictionary, use the following configuration:

**configure**

```
context <context_name>
```

```
cscf service <cscf_service_name>
```

```
    proxy-cscf
```

```
        diameter policy-control dictionary { Gq-custom | Gq-standard | Rq-
custom | Rx-rel8 | Rx-standard | Tx-standard | custom01 | custom02 | custom03 |
custom04 | custom05 | custom06 | custom07 | custom08 | custom09 }
```

```
    end
```

Dictionary	Description

## ■ Diameter Dictionary Types

Dictionary	Description
Cx-standard	Specifies standard attributes for the Cx interface.
Gq-custom	Specifies customized attributes for the 3GPP Gq interface.
Gq-standard	Specifies standard attributes for the 3GPP Gq interface.
Rq-custom	Custom-defined dictionary.
Rx-rel8	Rel. 8 Rx dictionary.
Rx-standard	Specifies standard attributes for the 3GPP Rx interface.
Tx-standard	Specifies the standard attributes for the 3GPP2 Tx interface.
custom01...custom $n$	Custom-defined dictionaries.



**Important:** For information on custom-defined dictionaries, please contact your local service representative.

## Diameter AAA

To specify the AAA dictionary to be used when Diameter is being used for accounting, in the AAA Server Group Configuration Mode or in the Context Configuration Mode, use the following command:

```
diameter accounting dictionary { aaa-custom1 | aaa-custom10 | aaa-custom2 | aaa-custom3 | aaa-custom4 | aaa-custom5 | aaa-custom6 | aaa-custom7 | aaa-custom8 | aaa-custom9 | nasreq | rf-plus }
```

To specify the AAA dictionary to be used when Diameter is being used for authentication, in the AAA Server Group Configuration Mode or in the Context Configuration Mode, use the following command:

```
diameter authentication dictionary { aaa-custom1 | aaa-custom10 | aaa-custom11 | aaa-custom12 | aaa-custom13 | aaa-custom14 | aaa-custom15 | aaa-custom16 | aaa-custom17 | aaa-custom18 | aaa-custom19 | aaa-custom2 | aaa-custom20 | aaa-custom3 | aaa-custom4 | aaa-custom5 | aaa-custom6 | aaa-custom7 | aaa-custom8 | aaa-custom9 | nasreq }
```

Dictionary	Description
aaa-custom1... aaa-custom8, aaa-custom10 ... aaa-custom $n$	Custom-defined dictionaries.
aaa-custom9	Specifies standard attributes for the STa interface.
nasreq	Specifies the NASREQ attributes defined by RFC 4005.
rf-plus	Specifies customer-specific enhanced attributes for the Rf interface.



**Important:** For information on custom-defined dictionaries, please contact your local service representative.

# Attributes



**Important:** Diameter attributes received by the system from the Diameter server always take precedence over local-subscriber attributes and parameters configured on the system.

## 3GPP-Called-Station-Id

This AVP identifies the layer 2 addresses the user contacted in the request.

**AVP Header**

30 10415

**Vendor ID**

10415

**VSA Type**

30

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

N/A

## 3GPP-CAMEL-Charging-Info

This AVP identifies the Customized Application for Mobile Enhanced Logic (CAMEL) charging information.

**AVP Header**

24 10415

**Vendor ID**

10415

**VSA Type**

24

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

N/A

---

## 3GPP-CF-IPv6-Address

3GPP-CF-IPv6-Address.

**AVP Header**

14 10415

**Vendor ID**

10415

**VSA Type**

14

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## 3GPP-CG-Address

This AVP contains the Charging Gateway address.

**AVP Header**

846 10415

**Vendor ID**

10415

**VSA Type**

846

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## 3GPP-Charging-Characteristics

This AVP contains the charging characteristics for this PDP Context received in the Create PDP Context Request Message.

**AVP Header**

13 10415

**Vendor ID**

10415

**VSA Type**

13

**AVP Type**

**■ Attributes**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

## 3GPP-Charging-Id

This AVP contains the Charging ID for this PDP Context (this together with the **GGSN-Address** constitutes a unique identifier for the PDP context).

**AVP Header**

2 10415

**Vendor ID**

10415

**VSA Type**

2

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## 3GPP-Charging-Rule-Based-Name

This AVP indicates the group name of charging rules residing in the TPF.

**AVP Header**

1004 10415

**Vendor ID**

10415

**VSA Type**

1004

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

## 3GPP-Feature-List

This AVP contains a bit mask indicating the supported features of an application.

**AVP Header**  
630 10415

**Vendor ID**  
10415

**VSA Type**  
630

**AVP Type**  
UINT32

**Group Value**  
N/A

**AVP Flag**  
M

## 3GPP-Feature-List-ID

This AVP contains the identity of a feature list.

**AVP Header**  
629 10415

**Vendor ID**  
10415

**VSA Type**  
629

**AVP Type**  
UINT32

**Group Value**  
N/A

**AVP Flag**  
M

## 3GPP-GGSN-Address

This AVP contains the GGSN IP address used by the GTP control plane for the context establishment. It is the same as the GGSN IP address used in the GCDRs.

**AVP Header**  
7 10415

**Vendor ID**  
10415

**VSA Type**  
7

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**■ Attributes**

**AVP Flag**  
M

---

## 3GPP-GGSN-MCC-MNC

This AVP contains MCC-MNC of the network the GGSN belongs to.

**AVP Header**  
9 10415

**Vendor ID**  
10415

**VSA Type**  
9

**AVP Type**  
UTF8STRING

**Group Value**  
N/A

**AVP Flag**  
M

---

## 3GPP-GPRS-QoS-Negotiated-Profile

This AVP contains QoS profile applied by GGSN.

**AVP Header**  
5 10415

**Vendor ID**  
10415

**VSA Type**  
5

**AVP Type**  
UTF8STRING

**Group Value**  
N/A

**AVP Flag**  
M

---

## 3GPP-IMEISV

This AVP contains International Mobile Equipment ID and its Software Version.

**AVP Header**  
20 10415

**Vendor ID**  
10415

**VSA Type**

20

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## 3GPP-IMSI

This AVP contains an IMSI of the user.

**AVP Header**

1 10415

**Vendor ID**

10415

**VSA Type**

1

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## 3GPP-IMSI-MCC-MNC

MCC and MNC extracted from the user's IMSI (first 5 or 6 digits, as applicable from the presented IMSI).

**AVP Header**

8 10415

**Vendor ID**

10415

**VSA Type**

8

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## 3GPP-MS-TimeZone

Indicates the Mobile Station Time Zone.

**AVP Header**

23 10415

**Vendor ID**

10415

**VSA Type**

23

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## 3GPP-NSAPI

Identifies a particular PDP context for the associated PDN and MSISDN/IMSI from creation to deletion.

**AVP Header**

10 10415

**Vendor ID**

10415

**VSA Type**

10

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## 3GPP-PDP-Type

Type of PDP context, for example IP or PPP.

**AVP Header**

3 10415

**Vendor ID**

10415

**VSA Type**

3

**AVP Type**

ENUM. Supported values are:

IPv4 (0)  
 PPP (1)  
 IPv6 (2)  
 IPv4v6 (3)

**Group Value**

N/A

**AVP Flag**

M

## 3GPP-Public-Identity

This AVP contains the public identity of a user in the IMS.

**AVP Header**

601 10415

**Vendor ID**

10415

**VSA Type**

601

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

## 3GPP-Quota-Consumption-Time

This AVP contains an idle traffic threshold time in seconds.

**AVP Header**

881 10415

**Vendor ID**

10415

**VSA Type**

881

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## 3GPP-Quota-Holding-Time

This AVP contains the quota holding time in seconds. The client starts the quota holding timer when quota consumption ceases. This is always when traffic ceases, i.e. the timer is re-started at the end of each packet. The Credit Control Client deems a quota to have expired when no traffic associated with the quota is observed for the value indicated by this AVP.

**AVP Header**

871 10415

**Vendor ID**

10415

**VSA Type**

871

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## 3GPP-RAT-Type

Indicates which Radio Access Technology is currently serving the UE.

**AVP Header**

21 10415

**Vendor ID**

10415

**VSA Type**

21

**AVP Type**

ENUM

**Group Value**

N/A

**AVP Flag**

M

## 3GPP-RAT-Type-Enum

Type of Radio Access Technology.

**AVP Header**

21 10415

**Vendor ID**

10415

**VSA Type**

21

**AVP Type**

ENUM. Supported values are:

- UTRAN (1)
- GERAN (2)
- WLAN (3)
- GAN (4)
- HSPA (5)
- EUTRAN (6)
- 3GPP2\_eHRPD (102)

**Group Value**

N/A

**AVP Flag**

M

## 3GPP-Reporting-Reason

Specifies the reason for usage reporting for one or more types of quota for a particular category.

**AVP Header**

872 10415

**Vendor ID**

10415

**VSA Type**

872

**AVP Type**

ENUM. Supported values are:

- THRESHOLD (0)
- QHT (1)
- FINAL (2)
- QUOTA\_EXAUSTED (3)
- VALIDITY\_TIME (4)
- OTHER\_QUOTA\_TYPE (5)
- RATING\_CONDITION\_CHANGE (6)
- FORCED\_REAUTHORIZATION (7)
- POOL\_EXAISTED (8)

**Group Value**

N/A

**AVP Flag**

M

---

## 3GPP-Selection-Mode

This AVP contains the Selection mode for this PDP Context received in the Create PDP Context Request Message.

**AVP Header**

12 10415

**Vendor ID**

10415

**VSA Type**

12

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## 3GPP-Server-Name

This AVP contains a SIP-URL of the S-CSCF server.

**AVP Header**

602 10415

**Vendor ID**

10415

**VSA Type**

602

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## 3GPP-Session-Stop-Indicator

Indicates to the AAA server that the last PDP context of a session is released and that the PDP session has been terminated.

**AVP Header**

11 10415

**Vendor ID**

10415

**VSA Type**

11

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## 3GPP-SGSN-Address

This AVP contains the SGSN address used by the GTP control plane for the handling of control messages. It may be used to identify the PLMN to which the user is attached.

**AVP Header**

6 10415

**Vendor ID**

10415

**VSA Type**

6

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## 3GPP-SGSN-IPv6-Address

This AVP contains the SGSN IPv6 address used by the GTP control plane for the handling of control messages. It may be used to identify the PLMN to which the user is attached.

**AVP Header**

15 10415

**Vendor ID**

10415

**VSA Type**

15

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## 3GPP-SGSN-MCC-MNC

Specifies the MCC-MNC of the network the SGSN belongs to.

**■ Attributes****AVP Header**

18 10415

**Vendor ID**

10415

**VSA Type**

18

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

## 3GPP-Supported-Features

This AVP contains a list of supported features of the origin host.

**AVP Header**

628 10415

**Vendor ID**

10415

**VSA Type**

628

**AVP Type**

GROUPED

**Group Value**

[ VENDOR\_ID ]

[ 3GPP FEATURE LIST ID ]

[ 3GPP FEATURE LIST ]

**AVP Flag**

M

## 3GPP-Time-Quota-Threshold

This AVP contains a threshold value in seconds.

**AVP Header**

868 10415

**Vendor ID**

10415

**VSA Type**

868

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## 3GPP-Trigger-Type

This AVP contains information about type of trigger, for example, CHANGE\_IN\_SGSN\_IP\_ADDRESS, CHANGE\_IN\_QOS, etc. for activation of the associated action.

**AVP Header**

870 10415

**Vendor ID**

10415

**VSA Type**

870

**AVP Type**

ENUM. Supported values are:

- CHANGE\_IN\_SGSN\_IP\_ADDRESS (1)
- CHANGE\_IN\_QOS (2)
- CHANGE\_IN\_LOCATION (3)
- CHANGE\_IN\_RAT (4)
- CHANGEINQOS\_TRAFFIC\_CLASS (10)
- CHANGEINQOS\_RELIABILITY\_CLASS (11)
- CHANGEINQOS\_DELAY\_CLASS (12)
- CHANGEINQOS\_PEAK\_THROUGHPUT (13)
- CHANGEINQOS\_PRECEDENCE\_CLASS (14)
- CHANGEINQOS\_MEAN\_THROUGHPUT (15)
- CHANGEINQOS\_MAXIMUM\_BIT\_RATE\_FOR\_UPLINK (16)
- CHANGEINQOS\_MAXIMUM\_BIT\_RATE\_FOR\_DOWNLINK (17)
- CHANGEINQOS\_RESIDUAL\_BER (18)
- CHANGEINQOS\_SDU\_ERROR\_RATIO (19)
- CHANGEINQOS\_TRANSFER\_DELAY (20)
- CHANGEINQOS\_TRAFFIC\_HANDLING\_PRIORITY (21)
- CHANGEINQOS\_GUARANTEED\_BIT\_RATE\_FOR\_UPLINK (22)
- CHANGEINQOS\_GUARANTEED\_BIT\_RATE\_FOR\_DOWNLINK (23)
- CHANGEINLOCATION\_MCC (30)
- CHANGEINLOCATION\_MNC (31)
- CHANGEINLOCATION\_RAC (32)
- CHANGEINLOCATION\_LAC (33)

**■ Attributes**

CHANGEINLOCATION\_CellId (34)  
CHANGE\_IN\_SERVING\_NODE (61)

**Group Value**

N/A

**AVP Flag**

M

## 3GPP-Unit-Quota-Threshold

This AVP contains a threshold value in service specific units.

**AVP Header**

1226 10415

**Vendor ID**

10415

**VSA Type**

1226

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## 3GPP-User-Data

This AVP contains the user data required to give service to a user.

**AVP Header**

606 10415

**Vendor ID**

10415

**VSA Type**

606

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## 3GPP-User-Location-Info

This AVP contains information about the users current geographical location.

**AVP Header**  
 22 10415

**Vendor ID**  
 10415

**VSA Type**  
 22

**AVP Type**  
 UTF8STRING

**Group Value**  
 N/A

**AVP Flag**  
 M

## 3GPP-Volume-Quota-Threshold

This AVP contains a threshold value in octets.

**AVP Header**  
 869 10415

**Vendor ID**  
 10415

**VSA Type**  
 869

**AVP Type**  
 UINT32

**Group Value**  
 N/A

**AVP Flag**  
 M

## 3GPP-WLAN-APN-Id

This AVP contains the W-APN for which the user will have services available.

**AVP Header**  
 11003 10415

**Vendor ID**  
 10415

**VSA Type**  
 11003

**AVP Type**  
 OCTETSTRING

**Group Value**  
 N/A

**AVP Flag**

## ■ Attributes

M

---

## 3GPP2-Allowed-Persistent-TFTS

Maximum allowed persistent TFTs.

**AVP Header**

6083 5535

**Vendor ID**

5535

**VSA Type**

6083

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## 3GPP2-BSID

3GPP2 BSID.

**AVP Header**

9010 5535

**Vendor ID**

5535

**VSA Type**

9010

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## 3GPP2-Correlation-Id

Correlation ID in 3GPP2 networks.

**AVP Header**

6071 5535

**Vendor ID**

5535

**VSA Type**

6071

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## 3GPP2-Information

**AVP Header**

6077 5535

**Vendor ID**

5535

**VSA Type**

6077

**AVP Type**

GROUPED

**Group Value**

- [ SUBSCRIBER\_PRIORITY ]
- [ AUTH\_PROFILE\_ID\_FORWARD ]
- [ AUTH\_PROFILE\_ID\_REVERSE ]
- [ AUTH\_PROFILE\_ID\_BI\_DIRECTION ]

**AVP Flag**

M

---

## 3GPP2-Inter-User-Priority

Inter user priority.

**AVP Header**

139 5535

**Vendor ID**

5535

**VSA Type**

139

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## 3GPP2-MEID

This AVP contains the International Mobile Equipment Identity.

**AVP Header**

1471 10415

**Vendor ID**

10415

**VSA Type**

1471

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## 3GPP2-Max-Auth-Aggr-BW-BET

Maximum allowed bandwidth for best effort link.

**AVP Header**

130 5535

**Vendor ID**

5535

**VSA Type**

130

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## 3GPP2-Max-Inst-Per-Service-Option

Maximum service option instances.

**AVP Header**

6082 5535

**Vendor ID**

5535

**VSA Type**

6082

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## 3GPP2-Max-Per-Flow-Priority-User

Per flow priority for the user.

**AVP Header**

6088 5535

**Vendor ID**

5535

**VSA Type**

6088

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## 3GPP2-Max-Svc-Inst-Link-Flow-Total

Maximum allowed link flows per service instance.

**AVP Header**

6084 5535

**Vendor ID**

5535

**VSA Type**

6084

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## 3GPP2-RAT-Type

3GPP2-RAT type.

**AVP Header**

1001 5535

**■ Attributes****Vendor ID**

5535

**VSA Type**

1001

**AVP Type**

ENUM. Supported values are:

3G1X (0)

HRPD (1)

WLAN (2)

**Group Value**

N/A

**AVP Flag**

M

## 3GPP2-RP-Session-ID

3GPP2 RP Session Identifier.

**AVP Header**

6074 5535

**Vendor ID**

5535

**VSA Type**

6074

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## 3GPP2-Service-Option

3GPP2 Service option number.

**AVP Header**

16 5535

**Vendor ID**

5535

**VSA Type**

16

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**  
M

## 3GPP2-Service-Option-Profile

3GPP2-Service-Option-Profile.

**AVP Header**  
74 5535

**Vendor ID**  
5535

**VSA Type**  
74

**AVP Type**  
GROUPED

**Group Value**  
[ 3GPP2\_SERVICE\_OPTION ]  
[ 3GPP2\_MAX\_INST\_PER\_SERVICE\_OPTION ]

**AVP Flag**  
M

## 3GPP2-Serving-PCF

3GPP2 Serving PCF Address

**AVP Header**  
6073 5535

**Vendor ID**  
5535

**VSA Type**  
6073

**AVP Type**  
ADDRESS

**Group Value**  
N/A

**AVP Flag**  
M

## 3GPP2-User-Zone

3GPP2 User Zone.

**AVP Header**  
6075 5535

## ■ Attributes

<b>Vendor ID</b>	5535
<b>VSA Type</b>	6075
<b>AVP Type</b>	OCTETSTRING
<b>Group Value</b>	N/A
<b>AVP Flag</b>	M

---

## Abort-Cause

Determines the cause of a session abort request or of an RAR indicating a PDP context release.

<b>AVP Header</b>	500 10415
<b>Vendor ID</b>	10415
<b>VSA Type</b>	500
<b>AVP Type</b>	ENUM
<b>Group Value</b>	N/A
<b>AVP Flag</b>	M

---

## Acceptable-Service-Info

The maximum bandwidth for an AF session and/or for specific media components that will be authorized by the PCRF.

<b>AVP Header</b>	526 10415
<b>Vendor ID</b>	10415
<b>VSA Type</b>	526
<b>AVP Type</b>	GROUPED
<b>Group Value</b>	<ul style="list-style-type: none"> <li>[ MEDIA_COMPONENT_DESCRIPTION ]</li> <li>[ MAX_REQUESTED_BANDWIDTH_DL ]</li> <li>[ MAX_REQUESTED_BANDWIDTH ]</li> </ul>

**AVP Flag**  
M

---

## Access-Network-Charging-Address

Indicates the IP address of the network entity within the access network performing charging (for example, the GGSN IP address).

**AVP Header**  
501 10415

**Vendor ID**  
10415

**VSA Type**  
501

**AVP Type**  
ADDRESS

**Group Value**  
N/A

**AVP Flag**  
M

---

## Access-Network-Charging-Identifier

This AVP contains a charging identifier (for example, GCID) within the Access-Network-Charging-Identifier-Value AVP along with information about the flows transported within the corresponding bearer within the Flows AVP.

**AVP Header**  
502 10415

**Vendor ID**  
10415

**VSA Type**  
502

**AVP Type**  
GROUPED

**Group Value**  
[ ACCESS\_NETWORK\_CHARGING\_IDENTIFIER\_VALUE ]  
[ FLOWS ]

**AVP Flag**  
M

---

## Access-Network-Charging-Identifier-Gx

The PCRF may use this information for charging correlation towards the AF.

**AVP Header**  
1022 10415

## ■ Attributes

**Vendor ID**

10415

**VSA Type**

1022

**AVP Type**

GROUPED

**Group Value**

[ ACCESS\_NETWORK\_CHARGING\_IDENTIFIER\_VALUE ]

[ CHARGING\_RULE\_BASE\_NAME ]

[ CHARGING\_RULE\_NAME ]

**AVP Flag**

M

## Access-Network-Charging-Identifier-Ty

This grouped AVP contains a charging identifier generated by the AGW within the Access-Network-Charging-Identifier-Value AVP and the related PCC rule name(s) within the Charging-Rule-Name AVP(s). The PCRF may use this information for charging correlation towards the AF.

**AVP Header**

1022 10415

**Vendor ID**

10415

**VSA Type**

1022

**AVP Type**

GROUPED

**Group Value**

[ ACCESS\_NETWORK\_CHARGING\_IDENTIFIER\_VALUE ]

[ CHARGING\_RULE\_BASE\_NAME ]

[ CHARGING\_RULE\_NAME ]

**AVP Flag**

M

## Access-Network-Charging-Identifier-Value

This AVP contains a charging identifier (for example, GCID).

**AVP Header**

503 10415

**Vendor ID**

10415

**VSA Type**

503

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

## Access-Network-Charging-Physical-Access-Id

This AVP indicates the identifier for the physical device the user is connected for charging.

**AVP Header**  
In 12.1 and earlier releases: 1472 10415

**Vendor ID**  
In 12.1 and earlier releases: 10415

**VSA Type**  
1472

**AVP Type**  
GROUPED

**Group Value**  
[ ACCESS\_NETWORK\_CHARGING\_PHYSICAL\_ACCESS\_ID\_VALUE ]  
[ ACCESS\_NETWORK\_CHARGING\_PHYSICAL\_ACCESS\_ID\_REALM ]

**AVP Flag**  
M

## Access-Network-Charging-Physical-Access-Id-Realm

This AVP indicates the domain of the physical device the user is connected for charging.

**AVP Header**  
In 12.1 and earlier releases: 1474 10415

**Vendor ID**  
In 12.1 and earlier releases: 10415

**VSA Type**  
1474

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

---

## Access-Network-Charging-Physical-Access-Id-Value

This AVP indicates the identifier value of the physical device the user is connected for charging.

**AVP Header**

In 12.1 and earlier releases: 1473 10415

**Vendor ID**

In 12.1 and earlier releases: 10415

**VSA Type**

1473

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## Access-Network-Information

This AVP indicates access network information, such as the information included in the SIP P-header “P-Access-Network-Information”.

**AVP Header**

1263 0

**Vendor ID**

0

**VSA Type**

1263

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## Access-Network-Physical-Access-Id

Conveys an identifier that represents the topological segment hosting the AT within the serving IP-CAN.

**AVP Header**

1472 5535

**Vendor ID**

5535

**VSA Type**

1472

**AVP Type**

GROUPED

**Group Value**

- [ ACCESS\_NETWORK\_PHYSICAL\_ACCESS\_ID\_VALUE ]
- [ ACCESS\_NETWORK\_PHYSICAL\_ACCESS\_ID\_REALM ]

**AVP Flag**

M

## Access-Network-Physical-Access-Id-Realm

Access-Network-Physical-Access ID Realm.

**AVP Header**

1474 5535

**Vendor ID**

5535

**VSA Type**

1474

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## Access-Network-Physical-Access-Id-Value

Access-Network-Physical-Access ID Value.

**AVP Header**

1473 5535

**Vendor ID**

5535

**VSA Type**

1473

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## Access-Network-Type

This attribute specifies the type of access network over which IP connectivity is provided to the user equipment.

## ■ Attributes

**AVP Header**  
306 0

**Vendor ID**  
0

**VSA Type**  
306

**AVP Type**  
GROUPED

**Group Value**  
N/A

**AVP Flag**  
M

## Access-Restriction-Data

Contains a bit mask indicating the services of a subscriber, that are barred by the operator.

**AVP Header**  
1426 10415

**Vendor ID**  
10415

**VSA Type**  
1426

**AVP Type**  
UINT32

**Group Value**  
N/A

**AVP Flag**  
M

## Accounting-EAP-Auth-Method

Indicates the EAP method(s) used to authenticate the user.

**AVP Header**  
465 0

**Vendor ID**  
0

**VSA Type**  
465

**AVP Type**  
UINT64

**Group Value**  
N/A

**AVP Flag**

N/A

---

## Accounting-Input-Octets

This AVP contains the number of octets in IP packets received from the user.

**AVP Header**

363 0

**Vendor ID**

0

**VSA Type**

363

**AVP Type**

UINT64

**Group Value**

N/A

**AVP Flag**

M

---

## Accounting-Input-Packets

This AVP contains the number of IP packets received from the user.

**AVP Header**

365 0

**Vendor ID**

0

**VSA Type**

365

**AVP Type**

UINT64

**Group Value**

N/A

**AVP Flag**

M

---

## Accounting-Output-Octets

This AVP contains the number of octets in IP packets sent to the user.

**AVP Header**

364 0

**Vendor ID**

0

**VSA Type**

## ■ Attributes

364

**AVP Type**

UINT64

**Group Value**

N/A

**AVP Flag**

M

## Accounting-Output-Packets

This AVP contains the number of IP packets sent to the user.

**AVP Header**

366 0

**Vendor ID**

0

**VSA Type**

366

**AVP Type**

UINT64

**Group Value**

N/A

**AVP Flag**

M

## Accounting-PCC-R3-P-Capability

This AVP indicates the accounting capabilities in a CCR that are supported by the sender. CCA will not include this AVP.

**AVP Header**

403 24757

**Vendor ID**

24757

**VSA Type**

403

**AVP Type**

ENUM. Supported values are:

Online (0)

Offline (1)

Online\_and\_Offline (2)

**Group Value**

N/A

**AVP Flag**

M

---

## Accounting-Record-Number

This AVP identifies this record within one session.

**AVP Header**

485 0

**Vendor ID**

0

**VSA Type**

485

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## Accounting-Record-Type

This AVP contains the type of accounting record being sent.

**AVP Header**

480 0

**Vendor ID**

0

**VSA Type**

480

**AVP Type**

ENUM. Supported values are:

EVENT\_RECORD (1)

START\_RECORD (2)

INTERIM\_RECORD (3)

STOP\_RECORD (4)

**Group Value**

N/A

**AVP Flag**

M

---

## Accounting-Sub-Session-Id

This AVP contains the accounting sub-session identifier.

## ■ Attributes

**AVP Header**

287 0

**Vendor ID**

0

**VSA Type**

287

**AVP Type**

UINT64

**Group Value**

N/A

**AVP Flag**

M

## Acct-Application-Id

Advertise support of the Accounting portion of an application.

**AVP Header**

259 0

**Vendor ID**

0

**VSA Type**

259

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## Acct-Interim-Interval

Sent from the Diameter Home Authorization Server to the Diameter client.

**AVP Header**

85 0

**Vendor ID**

0

**VSA Type**

85

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

N/A

---

## Acct-Multi-Session-Id

Link multiple related accounting sessions.

**AVP Header**

50 0

**Vendor ID**

0

**VSA Type**

50

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## Acct-Realtime-Required

This AVP is used to decide the action to be performed when sending of accounting records to the accounting server has been temporarily prevented due to network problem.

**AVP Header**

483 0

**Vendor ID**

0

**VSA Type**

483

**AVP Type**

ENUM. Supported values are:

DELIVER\_AND\_GRANT (1)

GRANT\_AND\_STORE (2)

GRANT\_AND\_LOSE (3)

**Group Value**

N/A

**AVP Flag**

M

---

## Acct-Session-Id

This AVP is only used when RADIUS/Diameter translation occurs. This AVP contains the contents of the RADIUS Acct-Session-Id attribute.

## ■ Attributes

**AVP Header**  
 44 0

**Vendor ID**  
 0

**VSA Type**  
 44

**AVP Type**  
 OCTETSTRING

**Group Value**  
 N/A

**AVP Flag**  
 M

---

## Acct-Session-Time

This AVP indicates the length of the current session in seconds. This AVP MUST be included in all Accounting-Request messages and MAY be present in the corresponding Accounting-Answer messages as well.

**AVP Header**  
 46 10415

**Vendor ID**  
 10415

**VSA Type**  
 46

**AVP Type**  
 UINT32

**Group Value**  
 N/A

**AVP Flag**  
 M

---

## Additional-MBMS-Trace-Info

This AVP contains additional information such as Trace-Reference, Triggering Events in BMSC, List of interfaces in BMSC, Trace Activity Control, etc.

**AVP Header**  
 910 10415

**Vendor ID**  
 10415

**VSA Type**  
 910

**AVP Type**  
 OCTETSTRING

**Group Value**

N/A

**AVP Flag**  
M

---

## Address-Realm

This AVP contains the realm that the user belongs to.

**AVP Header**  
1005 0**Vendor ID**  
0**VSA Type**  
1005**AVP Type**  
OCTETSTRING**Group Value**  
N/A**AVP Flag**  
M

---

## AF-Application-Identifier

This AVP contains information that identifies particular service that the Application Function (AF) service session belongs to.

**AVP Header**  
504 10415**Vendor ID**  
10415**VSA Type**  
504**AVP Type**  
OCTETSTRING**Group Value**  
N/A**AVP Flag**  
M

---

## AF-Charging-Identifier

The Application Function (AF) charging identifier that may be used in charging correlation.

**AVP Header**  
505 10415

**■ Attributes**

<b>Vendor ID</b>	10415
<b>VSA Type</b>	505
<b>AVP Type</b>	OCTETSTRING
<b>Group Value</b>	N/A
<b>AVP Flag</b>	M

---

## AF-Correlation-Information

This grouped AVP includes the AF Charging Identifier (ICID for IMS) and associated flow identifiers generated by the AF and received by GGSN over Rx/Gx.

<b>AVP Header</b>	1276 10415
<b>Vendor ID</b>	10415
<b>VSA Type</b>	1276
<b>AVP Type</b>	GROUPED
<b>Group Value</b>	[ AF_CHARGING_IDENTIFIER ] [ FLOWS ]
<b>AVP Flag</b>	M

---

## AGW-IP-Address

This AVP contains the IP address of Access Gateway (AGW) in IPv4 decimal notation format.

<b>AVP Header</b>	806 5535
<b>Vendor ID</b>	5535
<b>VSA Type</b>	806
<b>AVP Type</b>	OctetString
<b>Group Value</b>	N/A
<b>AVP Flag</b>	

M

---

## AGW-IPv6-Address

This AVP contains the IP address of Access Gateway (AGW) in IPv6 colon notation format.

**AVP Header**

807 5535

**Vendor ID**

5535

**VSA Type**

807

**AVP Type**

OctetString

**Group Value**

N/A

**AVP Flag**

M

---

## AGW-MCC-MNC

This AVP indicates the Mobile Country Code (MCC) and Mobile Network Code (MNC) of the AGW.

**AVP Header**

1002 5535

**Vendor ID**

5535

**VSA Type**

1002

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## Alert-Reason

This AVP indicates that the mobile subscriber is present or the MS has available memory.

**AVP Header**

1434 10415

**Vendor ID**

10415

**VSA Type**

**■ Attributes**

1434

**AVP Type**

ENUM. Supported values are:

UE\_PRESENT (0)

UE\_MEMORY\_AVAILABLE (1)

**Group Value**

N/A

**AVP Flag**

M

---

## All-APN-Configurations-Included-Indicator

This AVP indicates addition/modification/deletion of APN configuration for MME/SGSN service.

**AVP Header**

1428 10415

**Vendor ID**

10415

**VSA Type**

1428

**AVP Type**

ENUM. Supported values are:

ALL\_APN\_CONFIGURATIONS\_INCLUDED (0)

MODIFIED\_ADDED\_APN\_CONFIGURATIONS\_INCLUDED (1)

**Group Value**

N/A

**AVP Flag**

M

---

## Allocation-Retention-Priority

Allocation and retention priority.

**AVP Header**

1034 10415

**Vendor ID**

10415

**VSA Type**

1034

**AVP Type**

GROUPED

**Group Value**

[ AVP\_PRIORITY\_LEVEL ]

[ PRE\_EMPTION\_CAPABILITY ]

[ PRE\_EMPTION\_VULNERABILITY ]

**AVP Flag**  
M

## Alternative-APN

This AVP contains the value of a new APN. BM-SC only includes it if the UE must use a different APN for the MBMS PDP Context from the one used in the Join message.

**AVP Header**  
905 10415

**Vendor ID**  
10415

**VSA Type**  
905

**AVP Type**  
UTF8STRING

**Group Value**  
N/A

**AVP Flag**  
M

## AMBR

This AVP contains the UE Aggregate Maximum Bit Rate (AMBR) of the user. This will be present only if the non-3GPP access network is trusted.

**AVP Header**  
1435 10415

**Vendor ID**  
10415

**VSA Type**  
1435

**AVP Type**  
GROUPED

**Group Value**  
[ MAX\_REQUESTED\_BANDWIDTH\_UL ]  
[ MAX\_REQUESTED\_BANDWIDTH\_DL ]

**AVP Flag**  
M

## Anchor-Data-Path-Address

This AVP is set to the IP address of the serving SFA and is included in the CCR message.

**■ Attributes****AVP Header**

401 24757

**Vendor ID**

24757

**VSA Type**

401

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## AN-GW-Address

Access network gateway address.

**AVP Header**

1050 10415

**Vendor ID**

10415

**VSA Type**

1050

**AVP Type**

ADDRESS

**Group Value**

N/A

**AVP Flag**

M

## AN-Trusted

This AVP contains the 3GPP AAA Server's decision on handling the non-3GPP access network trusted or non-trusted.

**AVP Header**

1503 10415

**Vendor ID**

10415

**VSA Type**

1503

**AVP Type**

ENUM. Supported values are:

TRUSTED (0)

UNTRUSTED (1)

**Group Value**

N/A

**AVP Flag**

M

## ANID

Access Network Identity. This AVP contains the Access Network Identifier used for key derivation at the HSS.

**AVP Header**

6112 10415

**Vendor ID**

10415

**VSA Type**

In 10.2 and earlier releases: 6112

In 11.0 and later releases: 1504

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

## APN-Aggregate-Max-Bitrate-DL

Maximum aggregate bit rate in bits per seconds for the downlink direction across all non-GBR bearers related with the same APN.

**AVP Header**

1040 10415

**Vendor ID**

10415

**VSA Type**

1040

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## APN-Aggregate-Max-Bitrate-UL

Maximum aggregate bit rate in bits per seconds for the uplink direction across all non-GBR bearers related with the same APN.

**■ Attributes****AVP Header**

1041 10415

**Vendor ID**

10415

**VSA Type**

1041

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## APN-Authorized

APN-Authorized.

**AVP Header**

6090 10415

**Vendor ID**

10415

**VSA Type**

6090

**AVP Type**

GROUPED

**Group Value**

- [ CONTEXT\_IDENTIFIER ]
- [ CALLED\_STATION\_ID ]
- [ APN\_BARRING\_TYPE ]
- [ FRAMED\_IP\_ADDRESS ]
- [ FRAMED\_IPV6\_PREFIX ]
- [ MIP6\_AGENT\_INFO ]
- [ PDN\_GW\_ALLOCATION\_TYPE ]
- [ VPLMN\_DYNAMIC\_ADDRESS\_ALLOWED ]
- [ EPS\_SUBSCRIBED\_QOS\_PROFILE ]

**AVP Flag**

M

## APN-Barring-Type

Allows operator to disable all APNs for a subscriber at one time.

**AVP Header**

6091 10415

**Vendor ID**

10415

**VSA Type**

6091

**AVP Type**

ENUM. Supported values are:

NON\_3GPP\_APNS\_ENABLE (0)  
NON\_3GPP\_APNS\_DISABLE (1)

**Group Value**

N/A

**AVP Flag**

M

---

## APN-Configuration

This AVP contains the information related to the user's subscribed APN configurations.

**AVP Header**

1430 10415

**Vendor ID**

10415

**VSA Type**

1430

**AVP Type**

GROUPED

**Group Value**

- [ CONTEXT\_IDENTIFIER ]
- [ PDN\_TYPE ]
- [ SERVICE\_SELECTION ]
- [ EPS\_SUBSCRIBED\_QOS\_PROFILE ]
- [ VPLMN\_DYNAMIC\_ADDRESS\_ALLOWED ]
- [ MIP6\_AGENT\_INFO ]
- [ PDN\_GW\_ALLOCATION\_TYPE ]
- [ 3GPP\_CHARGING\_CHARACTERISTICS ]
- [ AMBR ]
- [ SERVED\_PARTY\_IP\_ADDRESS ]
- [ SPECIFIC\_APN\_INFO ]

**AVP Flag**

M

---

## APN-Configuration-Profile

This AVP contains the information related to the user's subscribed APN configurations for EPS.

**AVP Header**

1429 10415

**Vendor ID**

10415

**VSA Type**

1429

**AVP Type**

GROUPED

**Group Value**

- [ CONTEXT\_IDENTIFIER ]
- [ ALL\_APN\_CONFIGURATIONS\_INCLUDED\_INDICATOR ]
- [ APN\_CONFIGURATION ]

**AVP Flag**

M

---

## APN-OI-Replacement

This AVP contains the domain name to replace the APN OI when constructing the PDN GW FQDN upon which to perform a DNS resolution.

**AVP Header**

1427 10415

**Vendor ID**

10415

**VSA Type**

1427

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## Application-Provided-Called-Party-Address

This AVP holds the called party number (SIP URL, E.164), if it is determined by an application server.

**AVP Header**

837 10415

**Vendor ID**

10415

**VSA Type**

837

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## Application-Server

This AVP holds the SIP URL(s) of the AS(s) addressed during the session.

**AVP Header**

836 10415

**Vendor ID**

10415

**VSA Type**

836

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## Application-Server-Information

This AVP contains the list of application servers visited on the ISC interface.

**AVP Header**

850 10415

**Vendor ID**

10415

**VSA Type**

850

**AVP Type**

GROUPED

**Group Value**

[ APPLICATION\_SERVER ]

[ APPLICATION\_PROVIDED\_CALLED\_PARTY\_ADDRESS ]

**AVP Flag**

M

---

## ARP

Allocation and retention priority for the corresponding APN configuration.

**AVP Header**

6039 10415

**Vendor ID**

10415

**VSA Type**

6039

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## Associated-Identities

This AVP contains the private user identities associated to an IMS subscription.

**AVP Header**

632 10415

**Vendor ID**

10415

**VSA Type**

632

**AVP Type**

GROUPED

**Group Value**

[ USER\_NAME ]

**AVP Flag**

M

---

## Associated-Registered-Identities

Contains the Private User Identities registered with the Public User Identity received in the request command.

**AVP Header**

647 10415

**Vendor ID**

10415

**VSA Type**

647

**AVP Type**

GROUPED

**Group Value**

[ USER\_NAME ]

**AVP Flag**

N/A

## Associated-URI

This AVP holds a non-barred public user identity (SIP URI or TEL URI) associated to the the public user identity under registration.

**AVP Header**

856 10415

**Vendor ID**

10415

**VSA Type**

856

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

## Auth-Application-Id

This AVP contains the Diameter supported authorization application ID.

**AVP Header**

258 0

**Vendor ID**

0

**VSA Type**

258

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

N

## Auth-Grace-Period

This AVP contains the number of seconds the Diameter server will wait following the expiration of the Authorization-Lifetime AVP before cleaning up resources for the session.

**AVP Header**

**■ Attributes**

276 0

**Vendor ID**

0

**VSA Type**

276

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

N

## Authentication-Info

This AVP contains the Authentication Vectors.

**AVP Header**

6016 10415

**Vendor ID**

10415

**VSA Type**

6016

**AVP Type**

GROUPED

**Group Value**

[ EPS\_VECTOR ]

[ UMTS\_VECTOR ]

[ GERAN\_VECTOR ]

**AVP Flag**

M

## Authorised-QoS

This AVP holds the authorized QoS.

**AVP Header**

849 0

**Vendor ID**

0

**VSA Type**

849

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**  
M

---

## Authorization-Lifetime

This AVP contains the maximum number of seconds of service to be provided to the user before the user is to be re-authenticated and/or re-authorized.

**AVP Header**  
291 0

**Vendor ID**  
0

**VSA Type**  
291

**AVP Type**  
UINT32

**Group Value**  
N/A

**AVP Flag**  
N

---

## Authorization-Token

This AVP contains the authorization token defined in RFC 3520.

**AVP Header**  
506 10415

**Vendor ID**  
10415

**VSA Type**  
506

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

---

## Authorized-QoS

Used to carry the authorized QoS from the E-PDF to the IPC/GGSN.

**AVP Header**  
1016 10415

## ■ Attributes

**Vendor ID**

10415

**VSA Type**

1016

**AVP Type**

GROUPED

**Group Value**

[ QoS-Class ]

[ Max-Requested-Bandwidth-UL ]

[ Max-Requested-Bandwidth-DL ]

**AVP Flag**

M

## Auth-Profile-Id-Bi-Direction

3GPP2 Auth profile ID bi-direction.

**AVP Header**

6081 5535

**Vendor ID**

5535

**VSA Type**

6081

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## Auth-Profile-Id-Forward

3GPP2 Auth profile ID forward.

**AVP Header**

6079 5535

**Vendor ID**

5535

**VSA Type**

6079

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**  
M

---

## Auth-Profile-Id-Reverse

3GPP2 Auth profile ID reverse.

**AVP Header**  
6080 5535

**Vendor ID**  
5535

**VSA Type**  
6080

**AVP Type**  
UINT32

**Group Value**  
N/A

**AVP Flag**  
M

---

## Auth-Request-Type

Includes authorization request type to inform the peers whether a user is to be authenticated only, authorized only or both.

**AVP Header**  
274 0

**Vendor ID**  
0

**VSA Type**  
274

**AVP Type**  
ENUM. Supported values are:  
AUTHENTICATE\_ONLY (1)  
AUTHORIZE\_ONLY (2)  
AUTHORIZE\_AUTHENTICATE (3)

**Group Value**  
N/A

**AVP Flag**  
M

---

## Auth-Session-State

Specifies whether state is maintained for a particular session.

**AVP Header**

**■ Attributes**

277 0

**Vendor ID**

0

**VSA Type**

277

**AVP Type**

ENUM. Supported values are:

STATE\_MAINTAINED (0)

NO\_STATE\_MAINTAINED (1)

**Group Value**

N/A

**AVP Flag**

M

## AUTN

This AVP contains the Authentication token AUTN (EAP Authentication Vector).

**AVP Header**

1449 10415

**Vendor ID**

10415

**VSA Type**

1449

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## Base-Time-Interval

This AVP contains the length of the base time interval for controlling the consumption of time quota, in seconds.

**AVP Header**

1265 10415

**Vendor ID**

10415

**VSA Type**

1265

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**  
M

## BCID

This AVP holds the PacketCable 1.5 Billing Correlation ID as generated for a SIP session. This value is copied from the BCID field in the P-DCS-LAES header.

**AVP Header**  
200 4491

**Vendor ID**  
4491

**VSA Type**  
200

**AVP Type**  
UTF8STRING

**Group Value**  
N/A

**AVP Flag**  
M

## Bearer-Control-Mode

This AVP indicates the preferred bearer control mode.

In 10.0 and later releases, if the Bearer-Control-Mode (BCM) AVP is not received from PCRF, the IP-CAN session is not terminated. The value negotiated between UE/SGSN/GGSN is considered as the BCM. In earlier releases, if the PCRF did not send a BCM in CCA-I, the PCEF terminated the session.

The following values are considered for each of the service types.

- GGSN: The negotiated value between UE/SGSN/GGSN is considered.

In the following scenarios UE\_ONLY is chosen as the BCM:

Scenario 1:

- UE-> UE\_ONLY
- SGSN-> UE\_ONLY
- GGSN-> UE\_ONLY
- PCRF-> NO BCM

Scenario 2:

- UE-> UE\_ONLY
- SGSN-> UE\_ONLY
- GGSN-> Mixed
- PCRF-> NO BCM

**■ Attributes**

- GTP-PGW: BCM of UE\_NW is considered.
- IPSG: BCM of UE\_ONLY is considered.
- HSGW/SGW/PDIF/FA/PDSN/HA/MIPV6HA: BCM of NONE is considered.

**AVP Header**

1023 10415

**Vendor ID**

10415

**VSA Type**

1023

**AVP Type**

ENUM. Supported values are:

UE\_ONLY (0)

RESERVED (1)

UE\_NW (2)

**Group Value**

N/A

**AVP Flag**

M

## Bearer-Identifier

This AVP indicates the bearer to which the information belongs.

**AVP Header**

1020 10415

**Vendor ID**

10415

**VSA Type**

1020

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## Bearer-Operation

This AVP indicates the bearer event that causes the request for PCC rules.

**AVP Header**

1021 10415

**Vendor ID**

10415

**VSA Type**

1021

**AVP Type**

ENUM. Supported values are:

TERMINATION (0)

ESTABLISHMENT (1)

MODIFICATION (2)

**Group Value**

N/A

**AVP Flag**

M

## Bearer-Service

This AVP holds the used bearer service for the application, for example, PSTN leg in the case of voice.

**AVP Header**

854 10415

**Vendor ID**

10415

**VSA Type**

854

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## Bearer-Usage

This AVP indicates how the bearer is being used, for example, whether it is used as a dedicated IMS signaling context or not.

**AVP Header**

1000 10415

**Vendor ID**

10415

**VSA Type**

1000

**AVP Type**

ENUM. Supported values are:

GENERAL (0)

IMS\_SIGNALLING (1)

**■ Attributes**

DEDICATED (2) - This is specific to customer.

**Group Value**

N/A

**AVP Flag**

M

## Binding-Information

Used to convey binding information required for NA(P)T, hosted NA(P)T, and NA(P)T-PT control.

**AVP Header**

450 13019

**Vendor ID**

13019

**VSA Type**

450

**AVP Type**

GROUPED

**Group Value**

[ BINDING\_INPUT\_LIST ]  
[ BINDING\_OUTPUT\_LIST ]

**AVP Flag**

N/A

## Binding-Input-List

Contains a list of transport addresses for which a binding is requested.

**AVP Header**

451 13019

**Vendor ID**

13019

**VSA Type**

451

**AVP Type**

GROUPED

**Group Value**

[ V6\_TRANSPORT\_ADDRESS ]  
[ V4\_TRANSPORT\_ADDRESS ]

**AVP Flag**

N/A

---

## Binding-Output-List

Contains a list of transport addresses which is the result of the binding operation performed by the transport plane functions.

**AVP Header**

452 13019

**Vendor ID**

13019

**VSA Type**

452

**AVP Type**

GROUPED

**Group Value**

[ V6\_TRANSPORT\_ADDRESS ]

[ V4\_TRANSPORT\_ADDRESS ]

**AVP Flag**

N/A

---

## BM-Correlation-ID

Indicates unique correlation identifier for entire MIP session.

**AVP Header**

527 10415

**Vendor ID**

10415

**VSA Type**

527

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## BM-Type

Indicates home and visited Bearer Manager in current service flow.

**AVP Header**

1454 10415

**Vendor ID**

10415

**VSA Type**

1454

**■ Attributes****AVP Type**

ENUM. Supported values are:

HBM (0)

VBM (1)

**Group Value**

N/A

**AVP Flag**

M

**BSID**

BSID

**AVP Header**

10003 0

**Vendor ID**

0

**VSA Type**

10003

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

**Callback-Id**

This AVP contains the name of a place to be called, to be interpreted by the NAS.

**AVP Header**

20 0

**Vendor ID**

0

**VSA Type**

20

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## Callback-Number

This AVP contains a dialing string to be used for callback.

**AVP Header**

19 0

**Vendor ID**

0

**VSA Type**

19

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## Call-Barring-Info-List

This AVP contains the service codes for the short message related call barring services for a subscriber.

**AVP Header**

1488 10415

**Vendor ID**

10415

**VSA Type**

1488

**AVP Type**

GROUPED

**Group Value**

[ SS\_CODE ]

**AVP Flag**

M

---

## Called-Asserted-Identity

This AVP holds the address (Public User ID: SIP URI, E.164, etc.) of the finally asserted called party.

**AVP Header**

1250 10415

**Vendor ID**

10415

**VSA Type**

1250

**AVP Type**

UTF8STRING

## ■ Attributes

**Group Value**

N/A

**AVP Flag**

M

## Called-Party-Address

This AVP holds the address of the party to whom a session is established.

**AVP Header**

832 0

**Vendor ID**

0

**VSA Type**

832

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

## Called-Station-Id

Describing the layer 2 addresses the user contacted in the request.

**AVP Header**

30 0

**Vendor ID**

0

**VSA Type**

30

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## Call-ID-SIP-Header

Contains the information in the Call-ID header.

**AVP Header**

643 10415

<b>Vendor ID</b>	10415
<b>VSA Type</b>	643
<b>AVP Type</b>	OCTETSTRING
<b>Group Value</b>	N/A
<b>AVP Flag</b>	N/A

---

## Calling-Party-Address

This AVP holds the address of the party initiating a session.

<b>AVP Header</b>	831 10415
<b>Vendor ID</b>	10415
<b>VSA Type</b>	831
<b>AVP Type</b>	UTF8STRING
<b>Group Value</b>	N/A
<b>AVP Flag</b>	M

---

## Calling-Station-Id

Allows the NAS to send the ASCII string describing the layer 2 address from which the user connected in the request.

<b>AVP Header</b>	31 0
<b>Vendor ID</b>	0
<b>VSA Type</b>	31
<b>AVP Type</b>	UTF8STRING
<b>Group Value</b>	N/A
<b>AVP Flag</b>	N/A

---

## Cancellation-Type

Indicates the type of cancellation.

**AVP Header**

1420 10415

**Vendor ID**

10415

**VSA Type**

1420

**AVP Type**

ENUM. Supported values are:

MME\_UPDATE\_PROCEDURE (0)

SGSN\_UPDATE\_PROCEDURE (1)

SUBSCRIPTION\_WITHDRAWAL (2)

UPDATE\_PROCEDURE\_IWF (3)

**Group Value**

N/A

**AVP Flag**

M

---

## Carrier-Select-Routing-Information

This AVP holds information on carrier selection performed by S-CSCF/AS.

**AVP Header**

2023 10415

**Vendor ID**

10415

**VSA Type**

2023

**AVP Type**

UTF8 String

**Group Value**

N/A

**AVP Flag**

M

---

## Cause-Code

This AVP includes the cause code value from IMS node. It is used in Accounting-Request[stop] and/or Accounting-Request[event] messages.

**AVP Header**

861 0

**Vendor ID**

0

**VSA Type**

861

**AVP Type**

INT32

**Group Value**

N/A

**AVP Flag**

M

## CC-Correlation-Id

Correlates credit control requests generated for different components of the service.

**AVP Header**

411 0

**Vendor ID**

0

**VSA Type**

411

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## CC-Input-Octets

This AVP contains the number of requested granted or used octets that can be/have been received from the end user.

**AVP Header**

412 0

**Vendor ID**

0

**VSA Type**

412

**AVP Type**

UINT64

**Group Value**

N/A

**AVP Flag**

M

---

## CC-Money

This AVP indicates the monetary amount in the given currency.

**AVP Header**

413 0

**Vendor ID**

0

**VSA Type**

413

**AVP Type**

GROUPED

**Group Value**

N/A

**AVP Flag**

M

---

## CC-Output-Octets

This AVP contains the number of requested, granted, or used octets that can be/have been sent to the end user.

**AVP Header**

414 0

**Vendor ID**

0

**VSA Type**

414

**AVP Type**

UINT64

**Group Value**

N/A

**AVP Flag**

M

---

## CC-Request-Number

This AVP contains the number of Credit Control request for mapping requests and answers.

**AVP Header**

415 0

**Vendor ID**

0

**VSA Type**

415

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## CC-Request-Type

This AVP contains the type of credit-control Request/Answer message.

**AVP Header**

416 0

**Vendor ID**

0

**VSA Type**

416

**AVP Type**

ENUM. Supported values are:

- INITIAL\_REQUEST (1)
- UPDATE\_REQUEST (2)
- TERMINATION\_REQUEST (3)
- EVENT\_REQUEST (4)

**Group Value**

N/A

**AVP Flag**

M

## CC-Service-Specific-Units

This AVP specifies the number of service-specific units (for example, number of events, points) given in a selected service.

**AVP Header**

417 0

**Vendor ID**

0

**VSA Type**

417

**AVP Type**

UINT64

**Group Value**

N/A

**AVP Flag**

M

---

## CC-Session-Failover

Information as to whether moving the credit-control message stream to a backup server during an ongoing credit-control session is supported.

**AVP Header**

418 0

**Vendor ID**

0

**VSA Type**

418

**AVP Type**

ENUM. Supported values are:

FAILOVER\_NOT\_SUPPORTED (0)

FAILOVER\_SUPPORTED (1)

**Group Value**

N/A

**AVP Flag**

M

---

## CC-Sub-Session-Id

This AVP contains the credit-control sub-session identifier.

**AVP Header**

419 0

**Vendor ID**

0

**VSA Type**

419

**AVP Type**

UINT64

**Group Value**

N/A

**AVP Flag**

M

---

## CC-Time

This AVP indicates the length of the requested, granted, or used time in seconds.

**AVP Header**

420 0

**Vendor ID**

0

**VSA Type**

420

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## CC-Total-Octets

This AVP contains the total number of requested, granted, or used octets regardless of the direction.

**AVP Header**

421 0

**Vendor ID**

0

**VSA Type**

421

**AVP Type**

UINT64

**Group Value**

N/A

**AVP Flag**

M

---

## CC-Unit-Type

This AVP indicates the type of units.

**AVP Header**

454 0

**Vendor ID**

0

**VSA Type**

454

**AVP Type**

ENUM. Supported values are:

TIME (0)

MONEY(1)

TOTAL-OCTETS (2)

INPUT-OCTETS (3)

OUTPUT-OCTETS (4)

SERVICE-SPECIFIC-UNITS(5)

## ■ Attributes

**Group Value**

N/A

**AVP Flag**

M

## CG-Address

This AVP holds the IP-address of the charging gateway.

**AVP Header**

846 10415

**Vendor ID**

10415

**VSA Type**

846

**AVP Type**

ADDRESS

**Group Value**

N/A

**AVP Flag**

M

## Change-Condition

This AVP indicates the change in charging condition.

**AVP Header**

2037 10415

**Vendor ID**

10415

**VSA Type**

2037

**AVP Type**

ENUM. Supported values are:

NORMAL\_RELEASE (0)

ABNORMAL\_RELEASE(1)

QOS\_CHANGE(2)

VOLUME\_LIMIT(3)

TIME\_LIMIT(4)

SERVING\_NODE\_CHANGE(5)

SERVING\_NODE\_PLMN\_CHANGE(6)

USER\_LOCATION\_CHANGE(7)

RAT\_CHANGE(8)

UE\_TIME\_ZONE\_CHANGE(9)  
 TARIFF\_TIME\_CHANGE(10)  
 SERVICE\_IDLED\_OUT(11)  
 SERVICE\_SPECIFIC\_UNIT\_LIMIT(12)  
 MAX\_NUMBER\_OF\_CHARGING\_CONDITIONS(13)  
 MANAGEMENT\_INTERVENTION(14)

**Group Value**

N/A

**AVP Flag**

M

---

## Change-Time

This attribute holds the time in UTC format when the volume counts associated to the service data container is closed and reported due to Charging condition change.

**AVP Header**

2038 10415

**Vendor ID**

10415

**VSA Type**

2038

**AVP Type**

TIME

**Group Value**

N/A

**AVP Flag**

M

---

## CHAP-Auth

CHAP-Authentication

**AVP Header**

402 10415

**Vendor ID**

10415

**VSA Type**

402

**AVP Type**

GROUPED

**Group Value**

[ CHAP-IDENT ]

[ CHAP-RESPONSE ]

---

**■ Attributes**

**AVP Flag**  
M

---

## CHAP-Challenge

CHAP-Challenge

**AVP Header**  
60 10415

**Vendor ID**  
10415

**VSA Type**  
60

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

---

## CHAP-Ident

CHAP-Identifier

**AVP Header**  
404 10415

**Vendor ID**  
10415

**VSA Type**  
404

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

---

## CHAP-Response

CHAP-Response

**AVP Header**  
405 10415

**Vendor ID**  
10415

**VSA Type**  
405

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

---

## Chargeable-User-Id

MN-NAI identifying the user in EPS network.

**AVP Header**  
89 0

**Vendor ID**  
0

**VSA Type**  
89

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

---

## Charging-Characteristics

This AVP contains the charging mode to be applied.

**AVP Header**  
11006 10415

**Vendor ID**  
10415

**VSA Type**  
11006

**AVP Type**  
UINT32

**Group Value**  
N/A

**AVP Flag**  
M

---

## Charging-Data

This AVP contains addresses of the charging functions.

**AVP Header**

11005 10415

**Vendor ID**

10415

**VSA Type**

11005

**AVP Type**

GROUPED

**Group Value**

[ CHARGING\_CHARACTERISTICS ]

**AVP Flag**

M

---

## Charging-Information

This AVP contains the addresses of the charging functions in the grouped AVPs.

**AVP Header**

618 10415

**Vendor ID**

10415

**VSA Type**

618

**AVP Type**

GROUPED

**Group Value**

[ Primary-Event-Charging-Function-Name ]  
 [ Secondary-Event-Charging-Function-Name ]  
 [ Primary-Charging-Collection-Function-Name ]  
 [ Secondary-Charging-Collection-Function-Name ]

**AVP Flag**

M

---

## Charging-Rule-Base-Name

Indicates the name of a pre defined group of charging rules residing at the TPF.

**AVP Header**

1004 10415

**Vendor ID**

10415

**VSA Type**

1004

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## Charging-Rule-Definition

Defines the charging rule for a service flow sent by the CRF to the TPF.

**AVP Header**

1003 10415

**Vendor ID**

10415

**VSA Type**

1003

**AVP Type**

GROUPED

**Group Value**

- [ CHARGING\_RULE\_NAME ]
- [ SERVICE\_IDENTIFIER ]
- [ RATING\_GROUP ]
- [ FLOW\_DESCRIPTION ]
- [ REPORTING\_LEVEL ]
- [ ONLINE ]
- [ OFFLINE ]
- [ FLOW\_STATUS ]
- [ QOS\_INFORMATION ]
- [ METERING\_METHOD ]
- [ PRECEDENCE ]
- [ AF\_CHARGING\_IDENTIFIER ]
- [ FLOWS ]

**AVP Flag**

M

---

## Charging-Rule-Install

Used to activate, install, or modify Charging/Firewall rules from the Policy server. Charging/Firewall ruledefs for a subscriber can be dynamically activated from gx server. If the incoming rule fails to match in the charging ruledefs of a rulebase, then there will be a lookup with the Firewall ruledefs of the rulebase.

**AVP Header**

1001 10415

**Vendor ID**

10415

**VSA Type**

1001

**AVP Type**

GROUPED

**Group Value**

- [ CHARGING\_RULE\_DEFINITION ]
- [ CHARGING\_RULE\_NAME ]
- [ CHARGING\_RULE\_BASE\_NAME ]
- [ BEARER\_IDENTIFIER ]
- [ RULE\_ACTIVATION\_TIME ]
- [ RULE\_DEACTIVATION\_TIME ]
- [ RESOURCE\_ALLOCATION\_NOTIFICATION ]

**AVP Flag**

M

---

## Charging-Rule-Name

Specifies the charging rule name provided by the CRF. It uniquely identifies a charging rule for a bearer.

**AVP Header**

1005 10415

**Vendor ID**

10415

**VSA Type**

1005

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## Charging-Rule-Name-LI

Charging rule name for LI-Indicator-Gx.

**AVP Header**

1005 10415

**Vendor ID**

10415

**VSA Type**

1005

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## Charging-Rule-Remove

Specifies the deactivated or removed Charging/Firewall rules from the Policy server. Charging/Firewall ruledefs for a subscriber can be dynamically deactivated from gx server. If the incoming rule fails to match in the charging ruledefs of a rulebase, then there will be a lookup with the Firewall ruledefs of the rulebase.

**AVP Header**

1002 10415

**Vendor ID**

10415

**VSA Type**

1002

**AVP Type**

GROUPED

**Group Value**

[ CHARGING\_RULE\_NAME ]

[ CHARGING\_RULE\_BASE\_NAME ]

**AVP Flag**

M

---

## Charging-Rule-Report

This AVP is used to report the status of a Policy and Charging Control (PCC) rule for installation successful/removal. It is a reference for a specific PCC rule at the AGW that has been successfully installed, modified or removed because of trigger from the MS. The PCC-Rule-Status AVP indicates the action being performed on the PCC rule. Multiple instances of Charging-Rule-Report AVPs shall be used in the case it is required to report different PCCRULE-Status values for different groups of rules within the same Diameter command.

**AVP Header**

## ■ Attributes

1018 5535

**Vendor ID**

5535

**VSA Type**

1018

**AVP Type**

GROUPED

**Group Value**

- [ CHARGING\_RULE\_NAME ]
- [ CHARGING\_RULE\_BASE\_NAME ]
- [ PCC\_RULE\_STATUS ]
- [ RULE\_FAILURE\_CODE ]
- [ FINAL\_UNIT\_INDICATION ]

**AVP Flag**

M

## Check-Balance-Result

Result of the balance check. Applicable only when requested-Action AVP indicates CHECK\_BALANCE.

**AVP Header**

422 0

**Vendor ID**

0

**VSA Type**

422

**AVP Type**

ENUM. Supported values are:

ENOUGH\_CREDIT (0)

NO\_CREDIT (1)

**Group Value**

N/A

**AVP Flag**

M

## Civic-Location

This attribute provides location information.

**AVP Header**

355 13019

**Vendor ID**

13019

<b>VSA Type</b>	
355	
<b>AVP Type</b>	
OCTETSTRING	
<b>Group Value</b>	
N/A	
<b>AVP Flag</b>	
M	

---

## Class

Used by Diameter servers to return state information to the access device.

<b>AVP Header</b>	
25 0	
<b>Vendor ID</b>	
0	
<b>VSA Type</b>	
25	
<b>AVP Type</b>	
OCTETSTRING	
<b>Group Value</b>	
N/A	
<b>AVP Flag</b>	
M	

---

## Client-Identity

This attribute contains the ISDN number of the external client.

<b>AVP Header</b>	
1480 10415	
<b>Vendor ID</b>	
10415	
<b>VSA Type</b>	
1480	
<b>AVP Type</b>	
OCTETSTRING	
<b>Group Value</b>	
N/A	
<b>AVP Flag</b>	
M	

## CoA-Information

This attribute contains care-of-address and the tunnel information related to the care of address.

**AVP Header**

1039 10415

**Vendor ID**

10415

**VSA Type**

1039

**AVP Type**

GROUPED

**Group Value**

[ TUNNEL\_INFORMATION ]

[ COA\_IP\_ADDRESS ]

**AVP Flag**

M

## CoA-IP-Address

Care of IP address for DSMIP6 access.

**AVP Header**

1035 10415

**Vendor ID**

10415

**VSA Type**

1035

**AVP Type**

ADDRESS

**Group Value**

N/A

**AVP Flag**

M

## Codec-Data

This AVP contains CODEC-related information known at the AF.

**AVP Header**

524 10415

**Vendor ID**

10415

**VSA Type**

524

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

## Complete-Data-List-Included-Indicator

This attribute indicates addition/modification/deletion of PDP-Contexts at MME/SGSN.

**AVP Header**  
1468 10415

**Vendor ID**  
10415

**VSA Type**  
1468

**AVP Type**  
ENUM. Supported values are:

ALL\_PDP\_CONTEXTS\_INCLUDED (0)  
MODIFIED\_ADDED\_PDP\_CONTEXTS\_INCLUDED (1)

**Group Value**  
N/A

**AVP Flag**  
M

## Confidentiality-Key

This AVP contains the Confidentiality Key (CK).

**AVP Header**  
625 10415

**Vendor ID**  
10415

**VSA Type**  
625

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

## Configuration-Token

Sent by a Diameter Server to a Diameter Proxy Agent or Translation Agent in an AA-Answer command to indicate a type of user profile to be used.

**AVP Header**

78 0

**Vendor ID**

0

**VSA Type**

78

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

N/A

## Connect-Info

Sent in the AA-Request message or ACR STOP message.

**AVP Header**

77 0

**Vendor ID**

0

**VSA Type**

77

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

## Contact

Contains the contact addresses and parameters in the Contact header.

**AVP Header**

641 10415

**Vendor ID**

10415

**VSA Type**

641

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

N/A

---

## Content-Disposition

This AVP indicates how the message body or a message body part is to be interpreted (for example, session, render).

**AVP Header**

828 10415

**Vendor ID**

10415

**VSA Type**

828

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## Content-Length

This AVP holds the size of the message body.

**AVP Header**

827 10415

**Vendor ID**

10415

**VSA Type**

827

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## Content-Type

This AVP holds the media type (for example, application/sdp, text/html) of the message-body.

**AVP Header**

**■ Attributes**

826 10415

**Vendor ID**

10415

**VSA Type**

826

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

## Context-Identifier

Context identifier.

**AVP Header**

1423 10415

**Vendor ID**

10415

**VSA Type**

1423

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## Correlate-Reason

Indicates the reason that the Correlate message was sent.

**AVP Header**

202 4491

**Vendor ID**

4491

**VSA Type**

202

**AVP Type**

ENUM. Supported values are:

UNKNOWN (0)

B2BUA (1)

INITIAL\_SIP\_MESSAGE (2) — Initial SIP Message sent by target's S-CSCF

ADDITIONAL\_TARGET\_ENCOUNTERED (3)

HAND\_OFF\_OCCURRED (4)

ORIGINATION\_FROM\_APP\_SERVER (5) — Origination from an Application Server as a result of a termination on that Application Server.

BCID (6) — BCID received in the P-DCS-LAES header.

**Group Value**

N/A

**AVP Flag**

M

## Cost-Information

Cost information of service transferred by the credit-control client to the end user.

**AVP Header**

423 0

**Vendor ID**

0

**VSA Type**

423

**AVP Type**

GROUPED

**Group Value**

[ Unit-Value ]

[ Currency-Code ]

[ Cost-Unit ]

**AVP Flag**

M

## Cost-Unit

Specifies the applicable unit to the Cost-Information when the service cost is a cost per unit: can be minutes, hours, days and kilobytes.

**AVP Header**

424 0

**Vendor ID**

0

**VSA Type**

424

**AVP Type**

UTF8STRING

**Group Value**

N/A

**■ Attributes**

**AVP Flag**  
M

---

## CSG-Id

Closed Subscriber Group Identity used to identify Closed Subscriber Group within a PLMN.

**AVP Header**  
1437 10415

**Vendor ID**  
10415

**VSA Type**  
1437

**AVP Type**  
UINT32

**Group Value**  
N/A

**AVP Flag**  
M

---

## CSG-Subscription-Data

This attribute contains the CSG-Id and optionally an associated expiration date.

**AVP Header**  
1436 10415

**Vendor ID**  
10415

**VSA Type**  
1436

**AVP Type**  
GROUPED

**Group Value**  
[ CSG\_ID ]  
[ EXPIRATION\_DATE ]

**AVP Flag**  
M

---

## Credit-Control

Included in AA requests when the service element has credit-control application.

**AVP Header**  
426 0

**Vendor ID**

0

**VSA Type**

426

**AVP Type**

ENUM. Supported values are:

CREDIT\_AUTHORIZATION (0)

RE\_AUTHORIZATION (1)

**Group Value**

N/A

**AVP Flag**

M

## Credit-Control-Failure-Handling

The credit-control client uses this information to handle the credit control server failure.

**AVP Header**

427 0

**Vendor ID**

0

**VSA Type**

427

**AVP Type**

ENUM. Supported values are:

TERMINATE (0)

CONTINUE (1)

RETRY\_AND\_TERMINATE (2)

**Group Value**

N/A

**AVP Flag**

M

## Currency-Code

Currency in which the values of AVPs containing monetary units were given.

**AVP Header**

425 0

**Vendor ID**

0

**VSA Type**

425

**AVP Type**

UINT32

## ■ Attributes

**Group Value**

N/A

**AVP Flag**

M

## Current-Location

Indicates whether an active location retrieval has to be initiated or not.

**AVP Header**

707 0

**Vendor ID**

0

**VSA Type**

707

**AVP Type**

ENUM

**Group Value**

N/A

**AVP Flag**

M

## Customer-Id

Customer ID; used in header enrichment scenarios.

**AVP Header**

1146 8164

**Vendor ID**

8164

**VSA Type**

1146

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

## Data-Reference

Indicates the type of the requested used data in the operation UDR and SNR.

**AVP Header**

703 0

**Vendor ID**

0

**VSA Type**

703

**AVP Type**

ENUM

**Group Value**

N/A

**AVP Flag**

M

## Default-EPS-Bearer-QoS

Defines the QoS information for the EPS default bearer.

**AVP Header**

1049 10415

**Vendor ID**

10415

**VSA Type**

1049

**AVP Type**

GROUPED

**Group Value**

[ QOS\_CLASS\_IDENTIFIER ]

[ ALLOCATION\_RETENTION\_PRIORITY ]

**AVP Flag**

M

## Deregistration-Reason

This AVP contains the reason for a de-registration operation.

**AVP Header**

615 10415

**Vendor ID**

10415

**VSA Type**

615

**AVP Type**

GROUPED

**Group Value**

[ REASON\_CODE ]

[ REASON\_INFO ]

**■ Attributes**

**AVP Flag**  
M

---

## Destination-Host

The destination endpoint of the message. This attribute is present in all request messages.

**AVP Header**  
293 0

**Vendor ID**  
0

**VSA Type**  
293

**AVP Type**  
DIAMIDENT

**Group Value**  
N/A

**AVP Flag**  
M

---

## Destination-Realm

The realm the message is to be routed to. It is present in all request messages sent from DCCA.

**AVP Header**  
283 0

**Vendor ID**  
0

**VSA Type**  
283

**AVP Type**  
DIAMIDENT

**Group Value**  
N/A

**AVP Flag**  
M

---

## Diagnostics

This attribute provides a more detailed cause value for sending Accounting-request from PCN node.

**AVP Header**  
2039 10415

**Vendor ID**  
10415

**VSA Type**

2039

**AVP Type**

ENUM. Supported values are:

UNSPECIFIED (0)  
 SESSION\_TIMEOUT (1)  
 RESOURCE\_LIMITATION (2)  
 ADMIN\_DISCONNECT (3)  
 IDLE\_TIMEOUT (4)  
 PCRF\_UNREACHABLE (5)  
 AAA\_UNREACHABLE (6)  
 AAA\_INITIATED\_SESSION\_TERMINATION (7)  
 REAUTHENTICATION\_FAILED (8)  
 PCRF\_INITIATED\_SESSION\_TERMINATION (9)  
 PCRF\_INITIATED\_FLOW\_TERMINATION (10)  
 PCRF\_ACCOUNTING\_PARAMETERS\_CHANGED (11)  
 PMIP\_INITIATED\_SESSION\_TERMINATION (12)  
 PPP\_INITIATED\_SESSION\_TERMINATION (13)  
 GTP\_INITIATED\_SESSION\_TERMINATION (14)  
 PMIP\_REVOCATION (15)  
 HANDOVER\_ERROR (16)  
 PMIP\_LIFETIME\_EXPIRED (17)

**Group Value**

N/A

**AVP Flag**

M

---

## Dialog-Id

Contains the SIP dialog identifier in the form: Call-ID=x;FTag=y;TTag=z, where x is the value of the SIP Call-ID header, y is the contents of the From header tag, and z is the contents of the To header tag. If the To header tag value is not present in the SIP message then TTag field MUST not be present in the AVP.

**AVP Header**

203 4491

**Vendor ID**

4491

**VSA Type**

203

**AVP Type**

UTF8STRING

**■ Attributes****Group Value**

N/A

**AVP Flag**

M

## Digest-Algorithm

Holds the algorithm parameter that influences the HTTP Digest calculation.

**AVP Header**

111 0

**Vendor ID**

0

**VSA Type**

111

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## Digest-Auth-Param

This attribute is a placeholder for future extensions and corresponds to the "auth-param" parameter defined in section 3.2.1 of [RFC2617].

**AVP Header**

117 0

**Vendor ID**

0

**VSA Type**

117

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## Digest-Domain

Consists of a single URI that defines a protection space component.

**AVP Header**

119 0

<b>Vendor ID</b>	0
<b>VSA Type</b>	119
<b>AVP Type</b>	OCTETSTRING
<b>Group Value</b>	N/A
<b>AVP Flag</b>	M

---

## Digest-HA1

Contains the hexadecimal representation of H(A1) as described in [RFC2617].

<b>AVP Header</b>	121 0
<b>Vendor ID</b>	0
<b>VSA Type</b>	121
<b>AVP Type</b>	OCTETSTRING
<b>Group Value</b>	N/A
<b>AVP Flag</b>	M

---

## Digest-QoP

Holds the Quality of Protection parameter that influences the HTTP Digest calculation.

<b>AVP Header</b>	110 0
<b>Vendor ID</b>	0
<b>VSA Type</b>	110
<b>AVP Type</b>	OCTETSTRING
<b>Group Value</b>	N/A
<b>AVP Flag</b>	M

---

## Digest-Realm

Describes a protection space component of the RADIUS server.

**AVP Header**

104 0

**Vendor ID**

0

**VSA Type**

104

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## DIR

**AVP Header**

11000 0

**Vendor ID**

0

**VSA Type**

11000

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## Direct-Debiting-Failure-Handling

Specifies the action to handle the failure of request message to the credit control server with DIRECT\_DEBITING attribute.

**AVP Header**

428 0

**Vendor ID**

0

**VSA Type**

428

**AVP Type**

ENUM. Supported values are:

TERMINATE\_OR\_BUFFER (0)

CONTINUE (1)

**Group Value**

N/A

**AVP Flag**

M

## Direction

Indicates whether the reported message was sent "to" or "from" the intercept target.

**AVP Header**

210 4491

**Vendor ID**

4491

**VSA Type**

210

**AVP Type**

ENUM. Supported values are:

UNDEFINED (0)

TO\_TARGET (1)

FROM\_TARGET (2)

**Group Value**

N/A

**AVP Flag**

M

## Direct-Message

Indicates if the reported message is exchanged directly between the IAP and the intercept target.

**AVP Header**

211 4491

**Vendor ID**

4491

**VSA Type**

211

**AVP Type**

ENUM. Supported values are:

FALSE (0)

TRUE (1)

**Group Value**

N/A

**■ Attributes**

**AVP Flag**  
M

---

## Disconnect-Cause

Specifies the reason or cause of disconnection with peer.

**AVP Header**  
273 0

**Vendor ID**  
0

**VSA Type**  
273

**AVP Type**  
ENUM. Supported values are:

- REBOOTING (0)
- BUSY (1)
- DO\_NOT\_WANT\_TO\_TALK\_TO\_YOU (2)

**Group Value**  
N/A

**AVP Flag**  
N/A

---

## DSA-Flags

This AVP contains a bit mask.

**AVP Header**  
1422 10415

**Vendor ID**  
10415

**VSA Type**  
1422

**AVP Type**  
UINT32

**Group Value**  
N/A

**AVP Flag**  
M

---

## DSR-Flags

This AVP contains a bit mask.

**AVP Header**

1421 10415

**Vendor ID**

10415

**VSA Type**

1421

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## Dynamic-Address-Flag

This AVP indicates whether the PDP context/PDN address is statically or dynamically allocated. If not present, then it is statically allocated.

**AVP Header**

2051 10415

**Vendor ID**

10415

**VSA Type**

2051

**AVP Type**

ENUM. Supported values are:

STATIC (0)

DYNAMIC (1)

**Group Value**

N/A

**AVP Flag**

M

## EAP-Key-Name

This AVP contains an opaque key identifier (name) generated by the EAP method.

**AVP Header**

102 0

**Vendor ID**

0

**VSA Type**

102

**AVP Type**

OCTETSTRING

**■ Attributes****Group Value**

N/A

**AVP Flag**

M

## EAP-Master-Session-Key

This AVP contains keying material for protecting the communications between the user and the NAS.

**AVP Header**

464 0

**Vendor ID**

0

**VSA Type**

464

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

N/A

## EAP-Payload

Used to encapsulate the actual EAP packet that is being exchanged between the EAP client and the home Diameter server.

**AVP Header**

462 0

**Vendor ID**

0

**VSA Type**

462

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## EAP-Reissued-Payload

Sent in DEA for a non-fatal error, and encapsulates the previous EAP Request sent by the server

**AVP Header**

463 0

<b>Vendor ID</b>	0
<b>VSA Type</b>	463
<b>AVP Type</b>	OCTETSTRING
<b>Group Value</b>	N/A
<b>AVP Flag</b>	M

---

## Early-Media-Description

This grouped AVP describes the SDP session, media parameters, and timestamps related to media components set to active according to SDP signalling exchanged during a SIP session establishment before the final successful or unsuccessful SIP answer to the initial SIP INVITE message is received.

<b>AVP Header</b>	1272 10415
<b>Vendor ID</b>	10415
<b>VSA Type</b>	1272
<b>AVP Type</b>	GROUPED
<b>Group Value</b>	<ul style="list-style-type: none"> <li>[ SDP_TIMESTAMP ]</li> <li>[ SDP_MEDIA_COMPONENT ]</li> <li>[ SDP_SESSION_DESCRIPTION ]</li> </ul>
<b>AVP Flag</b>	M

---

## Element-ID

This AVP identifies the PacketCable IAP sending an intercept message to the DF.

<b>AVP Header</b>	212 4491
<b>Vendor ID</b>	4491
<b>VSA Type</b>	212
<b>AVP Type</b>	UTF8STRING
<b>Group Value</b>	

**■ Attributes**

N/A

**AVP Flag**  
M

## Element-Type

This AVP identifies the type of node where the intercept message was generated.

**AVP Header**  
213 4491**Vendor ID**  
4491**VSA Type**  
213**AVP Type**  
ENUM. Supported values are:

- S\_CSCF (0)
- P\_CSCF (1)
- I\_CSCF(2)
- MRFC (3)
- MGCF (4)
- BGCF (5)
- AS (6)
- UE (7)

**Group Value**  
N/A**AVP Flag**  
M

## Envelope

Reports the start and end time of one time envelope using the **AttributeEnvelope-Start-Time** and **AttributeEnvelope-End-Time** AVPs.

**AVP Header**  
1266 10415**Vendor ID**  
10415**VSA Type**  
1266**AVP Type**  
GROUPED**Group Value**

[ ENVELOPE\_START\_TIME ]  
 [ ENVELOPE\_END\_TIME ]  
 [ CC\_TOTAL\_OCTETS ]  
 [ CC\_INPUT\_OCTETS ]  
 [ CC\_OUTPUT\_OCTETS ]  
 [ CC\_SERVICE\_SPECIFIC\_UNITS ]

**AVP Flag**

M

---

## Envelope-End-Time

Time of the end of the time envelope.

**AVP Header**

1267 10415

**Vendor ID**

10415

**VSA Type**

1267

**AVP Type**

TIME

**Group Value**

N/A

**AVP Flag**

M

---

## Envelope-Reporting

Indicate whether the CLCI-C shall report the start and end of each time envelope, in those cases in which quota is consumed in envelopes.

**AVP Header**

1268 10415

**Vendor ID**

10415

**VSA Type**

1268

**AVP Type**

ENUM

**Group Value**

N/A

**AVP Flag**

M

---

## Envelope-Start-Time

Time of the packet of user data which caused the time envelope to start.

**AVP Header**

1269 10415

**Vendor ID**

10415

**VSA Type**

1269

**AVP Type**

TIME

**Group Value**

N/A

**AVP Flag**

M

---

## EPS-Information

EPS information.

**AVP Header**

1041 10415

**Vendor ID**

10415

**VSA Type**

1041

**AVP Type**

GROUPED

**Group Value**

[ AF\_CORRELATION\_INFORMATION ]

[ SGW\_ADDRESS ]

[ PGW\_ADDRESS ]

[ HSGW\_ADDRESS ]

[ 3GPP\_CF\_IPV6\_ADDRESS ]

[ PGW\_MCC\_MNC ]

[ EPS\_CAUSE\_CODE ]

[ NODE\_FUNCTIONALITY ]

[ CALLED\_STATION\_ID ]

[ ACCOUNTING\_INPUT\_OCTETS ]

[ ACCOUNTING\_OUTPUT\_OCTETS ]

[ ACCOUNTING\_INPUT\_PACKETS ]

[ ACCOUNTING\_OUTPUT\_PACKETS ]

- [ START\_TIME ]
- [ STOP\_TIME ]
- [ ACCT\_SESSION\_TIME ]
- [ OPERATOR\_STRING ]
- [ ACCESS\_NETWORK\_CHARGING\_IDENTIFIER\_VALUE ]
- [ FIRST\_PACKET\_DIRECTION ]
- [ PSCID ]
- [ FID ]
- [ CHARGING\_RULE\_BASE\_NAME ]
- [ CHARGING\_RULE\_NAME ]
- [ FLOW\_DESCRIPTION ]
- [ QOS\_INFORMATION ]
- [ PMIP\_MOBILE\_NODE\_ADDRESS ]
- [ 3GPP2\_BSID ]
- [ USER\_EQUIPMENT\_INFO ]

**AVP Flag**

M

---

## EPS-Subscribed-QoS-Profile

This attribute contains the bearer-level QoS parameters associated to the default bearer for an APN.

**AVP Header**

1431 10415

**Vendor ID**

10415

**VSA Type**

1431

**AVP Type**

GROUPED

**Group Value**

[ QOS\_CLASS\_IDENTIFIER ]

[ ARP ]

[ AMBR ]

**AVP Flag**

M

---

## EPS-Vector

This attribute contains Authentication Information for EPS.

**AVP Header**

**■ Attributes**

6017 10415

**Vendor ID**

10415

**VSA Type**

6017

**AVP Type**

GROUPED

**Group Value**

[ ITEM\_NUMBER ]

[ RAND ]

[ XRES ]

[ AUTN ]

[ KASME ]

**AVP Flag**

M

## Equipment-Status

This attribute contains the status of the mobile equipment.

**AVP Header**

1445 10415

**Vendor ID**

10415

**VSA Type**

1445

**AVP Type**

ENUM. Supported values are:

WHITELISTED (0)

BLACKLISTED (1)

GREYLISTED (2)

**Group Value**

N/A

**AVP Flag**

M

## ESN

ESN.

**AVP Header**

6109 10415

**Vendor ID**

10415  
**VSA Type**  
6109  
**AVP Type**  
OCTETSTRING  
**Group Value**  
N/A  
**AVP Flag**  
M

---

## Error-Message

Human Readable Error Message.

**AVP Header**  
281 0  
**Vendor ID**  
0  
**VSA Type**  
281  
**AVP Type**  
UTF8STRING  
**Group Value**  
N/A  
**AVP Flag**  
N/A

---

## Error-Reporting-Host

This AVP contains the identity of the Diameter host that sent the Result Code AVP to a value other than 2001.

**AVP Header**  
294 0  
**Vendor ID**  
0  
**VSA Type**  
294  
**AVP Type**  
DIAMIDENT  
**Group Value**  
N/A  
**AVP Flag**  
M

## ■ Attributes

---

## EUTRAN-Vector

EUTRAN Vector.

**AVP Header**

1414 10415

**Vendor ID**

10415

**VSA Type**

1414

**AVP Type**

GROUPED

**Group Value**

[ ITEM\_NUMBER ]

[ RAND ]

[ XRES ]

[ AUTN ]

[ KASME ]

**AVP Flag**

M

---

## Event

This AVP holds the content of the "Event" header used in SUBSCRIBE and NOTIFY messages.

**AVP Header**

825 10415

**Vendor ID**

10415

**VSA Type**

825

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## Event-Message-Type

Identifies the type of surveillance message.

**AVP Header**

214 4491

**Vendor ID**

4491

**VSA Type**  
214**AVP Type**

ENUM. Supported values are:

REPORT (0)

CORRELATE (1)

CARRIER\_INFO (2)

**Group Value**

N/A

**AVP Flag**

M

## Event-Report-Indication

Specifies which type of changes will trigger an event report from the PCRF. This attribute is used to report an event coming from BBERF/PCEF and also to provide information about some event-triggers to the PCRF.

**AVP Header**  
1033 10415**Vendor ID**  
10415**VSA Type**  
1033**AVP Type**  
GROUPED**Group Value**  

- [ EVENT\_TRIGGER ]
- [ RAT\_TYPE ]
- [ QOS\_INFORMATION ]
- [ RAI ]
- [ 3GPP\_USER\_LOCATION\_INFO ]
- [ TRACE\_DATA ]
- [ TRACE\_REFERENCE ]
- [ 3GPP2\_BSID ]
- [ 3GPP\_MS\_TIMEZONE ]
- [ 3GPP\_SGSN\_ADDRESS ]
- [ 3GPP\_SGSN\_IPV6\_ADDRESS ]

**AVP Flag**  
M

---

## Event-Timestamp

Records the time the event was reported.

**AVP Header**

55 0

**Vendor ID**

0

**VSA Type**

55

**AVP Type**

TIME

**Group Value**

N/A

**AVP Flag**

M

---

## Event-Trigger

Indicates an event that shall cause a re-request of charging rules.

**AVP Header**

1006 10415

**Vendor ID**

10415

**VSA Type**

1006

**AVP Type**

ENUM. Supported values are:

SGSN\_CHANGE (0)

QOS\_CHANGE (1)

RAT\_CHANGE (2)

TFT\_CHANGE (3)

PLMN\_CHANGE (4)

LOSS\_OF\_FLOW (5)

RECOVERY\_OF\_FLOW (6)

IP\_CAN\_CHANGE (7)

GW\_PCEF\_MALFUNCTION (8) — obsolete; must not be used

RESOURCES\_LIMITATION (9) — obsolete; must not be used

MAX\_NR\_BEARERS\_REACHED (10) — obsolete; must not be used

QOS\_CHANGE\_EXCEEDING\_AUTHORIZATION (11)

RAI\_CHANGE (12)

USER\_LOCATION\_CHANGE (13)  
 NO\_EVENT\_TRIGGER (14)  
 OUT\_OF\_CREDIT (15)  
 REALLOCATION\_OF\_CREDIT (16)  
 REVALIDATION\_TIMEOUT (17)  
 UE\_IP\_ADDRESS\_ALLOCATE (18)  
 UE\_IP\_ADDRESS\_RELEASE (19)  
 DEFAULT\_EPS\_BEARER\_QOS\_CHANGE (20)  
 AN\_GW\_CHANGE (21)  
 SUCCESSFUL\_RESOURCE\_ALLOCATION (22)  
 RESOURCE\_MODIFICATION\_REQUEST (23)  
 PGW\_TRACE\_CONTROL (24)  
 UE\_TIME\_ZONE\_CHANGE (25)  
 USAGE\_REPORT (26)  
 USAGE\_THRESHOLD\_REACHED (33)  
 SERVICE\_FLOW\_DETECTION (34)  
 PRESERVATION\_CHANGED (2000)  
 REACTIVATION\_CHANGED (2001)  
 TFT\_DELETED (1000)  
 LOSS\_OF\_BEARER (1001)  
 RECOVERY\_OF\_BEARER (1002)  
 POLICY\_ENFORCEMENT\_FAILED (1003)

**Group Value**  
N/A

**AVP Flag**  
M

---

## Event-Type

This grouped AVP contains information about the type of chargeable telecommunication service/event for which the accounting-request message is generated.

**AVP Header**  
823 10415

**Vendor ID**  
10415

**VSA Type**  
823

**AVP Type**  
GROUPED

## ■ Attributes

**Group Value**

- [ SIP\_METHOD ]
- [ EVENT ]
- [ EXPIRES ]

**AVP Flag**

M

## Experimental-Result

This AVP contains the Result code of SUCCESS or FAILURE. The exact value is specific to Vendor-Id.

**AVP Header**

297 0

**Vendor ID**

0

**VSA Type**

297

**AVP Type**

GROUPED

**Group Value**

- [ VENDOR\_ID ]
- [ EXPERIMENTAL\_RESULT\_CODE ]

**AVP Flag**

M

## Experimental-Result-Code

This AVP contains vendor specific result codes to indicate temporary or permanent failures.

**AVP Header**

298 0

**Vendor ID**

0

**VSA Type**

298

**AVP Type**

ENUM. Supported values are:

- DIAMETER\_MULTI\_ROUND\_AUTH (1001)
- DIAMETER\_SUCCESS (2001)
- DIAMETER\_LIMITED\_SUCCESS (2002)
- DIAMETER\_PDP\_CONTEXT\_DELETION\_INDICATION (2021)
- DIAMETER\_UNREGISTERED\_SERVICE (2003)
- DIAMETER\_SUCCESS\_NOT\_SUPPORTED\_USER\_DATA (2004)

DIAMETER\_SUCCESS\_SERVER\_NAME\_NOT\_STORED (2005)  
DIAMETER\_COMMAND\_UNSUPPORTED (3001)  
DIAMETER\_UNABLE\_TO\_DELIVER (3002)  
DIAMETER\_REALM\_NOT\_SERVED (3003)  
DIAMETER\_TOO\_BUSY (3004)  
DIAMETER\_LOOP\_DETECTED (3005)  
DIAMETER\_REDIRECT\_INDICATION (3006)  
DIAMETER\_APPLICATION\_UNSUPPORTED (3007)  
DIAMETER\_INVALID\_HDR\_BITS (3008)  
DIAMETER\_INVALID\_AVP\_BITS (3009)  
DIAMETER\_UNKNOWN\_PEER (3010)  
DIAMETER\_AUTHENTICATION\_REJECTED (4001)  
DIAMETER\_OUT\_OF\_SPACE (4002)  
ELECTION\_LOST (4003)  
DIAMETER\_END\_USER\_SERVICE\_DENIED (4010)  
DIAMETER\_CREDIT\_CONTROL\_NOT\_APPLICABLE (4011)  
DIAMETER\_CREDIT\_LIMIT\_REACHED (4012)  
INSUFFICIENT-RESOURCES (4041)  
COMMIT-FAILURE (4043)  
REFRESH-FAILURE (4044)  
QOS-PROFILE-FAILURE (4045)  
ACCESS-PROFILE-FAILURE (4046)  
PRIORITY-NOT-GRANTED (4047)  
DIAMETER\_USER\_DATA\_NOT\_AVAILABLE (4100)  
DIAMETER\_PRIOR\_UPDATE\_IN\_PROGRESS (4101)  
DIAMETER\_ERROR\_OUT\_OF\_RESOURCES (4121)  
DIAMETER\_PCC\_BEARER\_EVENT (4141)  
AUTHENTICATION\_DATA\_UNAVAILABLE (4181)  
DIAMETER\_AVP\_UNSUPPORTED (5001)  
DIAMETER\_UNKNOWN\_SESSION\_ID (5002)  
DIAMETER\_AUTHORIZATION\_REJECTED (5003)  
DIAMETER\_INVALID\_AVP\_VALUE (5004)  
DIAMETER\_MISSING\_AVP (5005)  
DIAMETER\_RESOURCES\_EXCEEDED (5006)  
DIAMETER\_CONTRADICTING\_AVPS (5007)  
DIAMETER\_AVP\_NOT\_ALLOWED (5008)  
DIAMETER\_AVP\_OCCURS\_TOO\_MANY\_TIMES (5009)

## ■ Attributes

DIAMETER\_NO\_COMMON\_APPLICATION (5010)  
DIAMETER\_UNSUPPORTED\_VERSION (5011)  
DIAMETER\_UNABLE\_TO\_COMPLY (5012)  
DIAMETER\_INVALID\_BIT\_IN\_HEADER (5013)  
DIAMETER\_INVALID\_AVP\_LENGTH (5014)  
DIAMETER\_INVALID\_MESSAGE\_LENGTH (5015)  
DIAMETER\_INVALID\_AVP\_BIT\_COMBO (5016)  
DIAMETER\_NO\_COMMON\_SECURITY (5017)  
BINDING-FAILURE (5021)  
DIAMETER\_USER\_UNKNOWN (5030)  
DIAMETER\_RATING\_FAILED (5031)  
MODIFICATION-FAILURE (5041)  
INVALID\_SERVICE\_INFORMATION (5061)  
FILTER\_RESTRICTIONS (5062)  
REQUESTED\_SERVICE\_NOT\_AUTHORIZED (5063)  
DUPLICATED\_AF\_SESSION (5064)  
IP\_CAN\_SESSION\_NOT\_AVAILABLE (5065)  
DIAMETER\_ERROR\_USER\_DATA\_NOT\_RECOGNIZED (5100)  
DIAMETER\_ERROR\_OPERATION\_NOT\_ALLOWED (5101)  
DIAMETER\_ERROR\_USER\_DATA\_CANNOT\_BE\_READ (5102)  
DIAMETER\_ERROR\_USER\_DATA\_CANNOT\_BE\_MODIFIED (5103)  
DIAMETER\_ERROR\_USER\_DATA\_CANNOT\_BE\_NOTIFIED (5104)  
DIAMETER\_ERROR\_SUBS\_DATA\_ABSENT (5106)  
DIAMETER\_ERROR\_NO\_SUBSCRIPTION\_TO\_DATA (5107)  
DIAMETER\_ERROR\_DSAI\_NOT\_AVAILABLE (5108)  
DIAMETER\_ERROR\_START\_INDICATION (5120)  
DIAMETER\_ERROR\_STOP\_INDICATION (5121)  
DIAMETER\_ERROR\_UNKNOWN\_MBMS\_BEARER\_SERVICE (5122)  
DIAMETER\_ERROR\_SERVICE\_AREA (5123)  
DIAMETER\_ERROR\_INITIAL\_PARAMETERS (5140)  
DIAMETER\_ERROR\_TRIGGER\_EVENT (5141)  
DIAMETER\_PCC\_RULE\_EVENT (5142)  
DIAMETER\_ERROR\_BEARER\_NOT\_AUTHORIZED (5143)  
DIAMETER\_ERROR\_TRAFFIC\_MAPPING\_INFO\_REJECTED (5144)  
DIAMETER\_QOS\_RULE\_EVENT (5145)  
DIAMETER\_BEARER\_EVENT (5146) — in 10.2 and earlier releases  
DIAMETER\_BEARER\_EVENT (4142) — in 11.0 and later releases

DIAMETER\_ERROR\_CONFLICTING\_REQUEST (5147)  
 ERROR\_UNKNOWN\_EPS\_SUBSCRIPTION (5420)  
 ERROR\_RAT\_NOT\_ALLOWED (5421)  
 ERROR\_ROAMING\_NOT\_ALLOWED (5402)  
 ERROR\_EQUIPMENT\_UNKNOWN (5422)

**Group Value**

N/A

**AVP Flag**

M

---

## Expiration-Date

This attribute contains the information on when the subscription to the CSG-Id expires.

**AVP Header**

1439 10415

**Vendor ID**

10415

**VSA Type**

1439

**AVP Type**

TIME

**Group Value**

N/A

**AVP Flag**

M

---

## Expires

This AVP holds the content of the "Expires" header.

**AVP Header**

888 10415

**Vendor ID**

10415

**VSA Type**

888

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## Exponent

Exponent AVP contains the exponent value to be applied for the Value-Digit AVP within the Unit-Value AVP.

**AVP Header**

429 0

**Vendor ID**

0

**VSA Type**

429

**AVP Type**

INT32

**Group Value**

N/A

**AVP Flag**

M

## Extended-QoS-Filter-Rule

Defines one or more traffic flows together with a set of QoS parameters that should be applied to the flow(s) by the Resource Management Function.

**AVP Header**

6066 0

**Vendor ID**

0

**VSA Type**

6066

**AVP Type**

INT32

**Group Value**

N/A

**AVP Flag**

M

## External-Client

This attribute contains the identities of the external clients that are allowed to locate a target UE for a MT-LR.

**AVP Header**

1479 10415

**Vendor ID**

10415

**VSA Type**

1479

**AVP Type**

GROUPED

**Group Value**

- [ CLIENT\_IDENTITY ]
- [ GMLC\_RESTRICTION ]
- [ NOTIFICATION\_TO\_UE\_USER ]

**AVP Flag**

M

## Failed-AVP

This AVP contains the missing and/or unsupported AVPs that caused the failure.

**AVP Header**

279 0

**Vendor ID**

0

**VSA Type**

279

**AVP Type**

GROUPED

**Group Value**

N/A

**AVP Flag**

M

## FDR-Reason

Indicates the reason for FDR cut.

**AVP Header**

1501 10415

**Vendor ID**

10415

**VSA Type**

1501

**AVP Type**

ENUM. Supported values are:

- END\_FLOW (0)
- IPGW\_HO (1)
- FORCED\_CLOSURE (2)

**Group Value**

N/A

**AVP Flag**

M

## Feature-List

This AVP contains a bit mask indicating the supported features of an application.

**AVP Header**

630 10415

**Vendor ID**

10415

**VSA Type**

630

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

N/A

## Feature-List-ID

This AVP contains the identity of the featured list.

**AVP Header**

629 10415

**Vendor ID**

10415

**VSA Type**

629

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

N/A

## Feature-List-ID-Resp

Contains the identity of the featured list.

**AVP Header**

629 10415

**Vendor ID**

10415

**VSA Type**

629

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

N/A

---

## Feature-List-Resp

Contains a bit mask indicating the supported features of an application.

**AVP Header**

630 10415

**Vendor ID**

10415

**VSA Type**

630

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

N/A

---

## FID

Contains the Flow Correlation ID.

**AVP Header**

7003 10415

**Vendor ID**

10415

**VSA Type**

7003

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## Filter-Id

The name of the filter list for this user.

**AVP Header**

11 0

## ■ Attributes

<b>Vendor ID</b>	0
<b>VSA Type</b>	11
<b>AVP Type</b>	UTF8STRING
<b>Group Value</b>	N/A
<b>AVP Flag</b>	M

---

## Final-Unit-Action

The Final-Unit-Action AVP defines the behavior of the service element when the user's account cannot cover the cost of the service.

<b>AVP Header</b>	449 0
<b>Vendor ID</b>	0
<b>VSA Type</b>	449
<b>AVP Type</b>	ENUM. Supported values are: TERMINATE(0) REDIRECT(1) RESTRICT_ACCESS (2)
<b>Group Value</b>	N/A
<b>AVP Flag</b>	M

---

## Final-Unit-Indication

Indicates that the Granted-Service-Unit AVP in the Credit-Control-Answer, or in the AA answer, contains the final units for the service.

<b>AVP Header</b>	430 0
<b>Vendor ID</b>	0
<b>VSA Type</b>	430
<b>AVP Type</b>	GROUPED

**Group Value**

- [ FINAL\_UNIT\_ACTION ]
- [ RESTRICTION\_FILTER\_RULE ]
- [ FILTER\_ID ]
- [ REDIRECT\_SERVER ]

**AVP Flag**

M

---

## Firmware-Revision

Support for Vendor Specific Applications.

**AVP Header**

267 0

**Vendor ID**

0

**VSA Type**

267

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

N/A

---

## Flow-Description

Defines the service flow filter parameters for a charging rule.

**AVP Header**

507 10415

**Vendor ID**

10415

**VSA Type**

507

**AVP Type**

IPFILTERRULE

**Group Value**

N/A

**AVP Flag**

M

## Flow-Description-Info

This grouped AVP is used within the Flow-Info AVP to identify a flow and associated precedence value from the AGW to the PCRF.

**AVP Header**

1022 5535

**Vendor ID**

5535

**VSA Type**

1022

**AVP Type**

GROUPIED

**Group Value**

[ FLOW\_DESCRIPTION ]

[ PRECEDENCE ]

**AVP Flag**

M

## Flow-Grouping

Indicates that no other IP Flows shall be transported together with the listed IP Flows in the same PDP context(s).

**AVP Header**

508 10415

**Vendor ID**

10415

**VSA Type**

508

**AVP Type**

GROUPIED

**Group Value**

[ FLOWS ]

**AVP Flag**

M

## Flow-Identifier

This AVP contains the identifier of the IP flow(s) of a given Flow-Info to which specific information refers.

**AVP Header**

810 5535

**Vendor ID**

5535

**VSA Type**

810

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

## Flow-Info

This AVP contains the customized information of the IP flow(s). This is a unique identifier within the context of an IP-CAN session for the IP flow(s) given within the same Flow-Info AVP. The flow identifier is selected by AGW. The Flow-Description AVP(s) describe the flow using an IPFilterRule. If two Flow-Description AVPs are included, one shall represent the uplink and the other the downlink.

**AVP Header**  
809 5535

**Vendor ID**  
5535

**VSA Type**  
809

**AVP Type**  
GROUPED

**Group Value**  
[ FLOW\_IDENTIFIER ]  
[ FLOW\_DESCRIPTION\_INFO ]  
[ REQUESTED\_QOS ]  
[ GRANTED\_QOS ]  
[ FLOW\_STATUS ]

**AVP Flag**  
M

## Flow-Information

This AVP contains the information from a single IP flow packet filter including the flow description.

**AVP Header**  
1058 10415

**Vendor ID**  
10415

**VSA Type**  
1058

**AVP Type**  
GROUPED

**Group Value**  
[ FLOW\_DESCRIPTION ]

**■ Attributes**

[ PACKET\_FILTER\_IDENTIFIER ]  
 [ TOS\_TRAFFIC\_CLASS ]  
 [ SECURITY\_PARAMETER\_INDEX ]  
 [ FLOW\_LABEL ]

**AVP Flag**

M

## Flow-Label

Contains the IPv6 flow label header field.

**AVP Header**

1057 10415

**Vendor ID**

10415

**VSA Type**

1057

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## Flow-Number

This AVP contains the ordinal number of the IP flow(s).

**AVP Header**

509 10415

**Vendor ID**

10415

**VSA Type**

509

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## Flow-Operation

This AVP indicates the IP-CAN flow event that causes a request for PCC rules.

**AVP Header**

800 5535

**Vendor ID**

5535

**VSA Type**

800

**AVP Type**

ENUM. Supported values are:

TERMINATION (0)

ESTABLISHMENT (1)

MODIFICATION (2)

**Group Value**

N/A

**AVP Flag**

M

## Flows

The flow identifiers of the IP flows related to a charging rule as provided by the Application Function (AF).

**AVP Header**

510 10415

**Vendor ID**

10415

**VSA Type**

510

**AVP Type**

GROUPED

**Group Value**

[ MEDIA\_COMPONENT\_NUMBER ]

[ FLOW\_NUMBER ]

**AVP Flag**

M

## Flow-Status

Describes whether the IP flow(s) are enabled or disabled.

**AVP Header**

511 10415

**Vendor ID**

10415

**VSA Type**

511

**■ Attributes****AVP Type**

ENUM. Supported values are:

ENABLED-UPLINK (0)

ENABLED-DOWNLINK (1)

ENABLED (2)

DISABLED (3)

REMOVED (4)

TERMINATE (5)

**Group Value**

N/A

**AVP Flag**

M

## Flow-Usage

Provides information about the usage of IP Flows.

**AVP Header**

512 10415

**Vendor ID**

10415

**VSA Type**

512

**AVP Type**

ENUM

**Group Value**

N/A

**AVP Flag**

M

## Framed-Appletalk-Link

This AVP contains the AppleTalk network number that should be used for the serial link to the user, which is another AppleTalk router.

**AVP Header**

37 0

**Vendor ID**

0

**VSA Type**

37

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**  
M

---

## Framed-Appletalk-Network

This AVP contains the AppleTalk Network number that the NAS should probe to allocate an AppleTalk node for the user.

**AVP Header**  
38 0

**Vendor ID**  
0

**VSA Type**  
38

**AVP Type**  
UINT32

**Group Value**  
N/A

**AVP Flag**  
M

---

## Framed-Appletalk-Zone

This AVP contains the AppleTalk Default Zone to be used for the user.

**AVP Header**  
39 0

**Vendor ID**  
0

**VSA Type**  
39

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

---

## Framed-Compression

This AVP contains the compression protocol to be used for the link.

**AVP Header**  
13 0

**Vendor ID**

**■ Attributes**

0

**VSA Type**  
13**AVP Type**

ENUM. Supported values are:

None (0)

VJ\_TCP-IP\_header\_compression (1)

IPX-header-compression (2)

Stac-LZS-compression (3)

**Group Value**

N/A

**AVP Flag**

M

## Framed-Interface-Id

This AVP contains the IPv6 interface identifier to be configured for the user.

**AVP Header**

96 0

**Vendor ID**

0

**VSA Type**

96

**AVP Type**

UINT64

**Group Value**

N/A

**AVP Flag**

M

## Framed-IP-Address

This AVP contains an IPv4 address of the type specified in the attribute value to be configured for the user.

**AVP Header**

8 0

**Vendor ID**

0

**VSA Type**

8

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**  
M

## Framed-IP-Netmask

This AVP contains the four octets of the IPv4 netmask to be configured for the user when the user is a router to a network.

**AVP Header**  
9 0

**Vendor ID**  
0

**VSA Type**  
9

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

## Framed-IPv6-Pool

This AVP contains the name of an assigned pool that must be used to assign an IPv6 prefix for the user.

**AVP Header**  
100 0

**Vendor ID**  
0

**VSA Type**  
100

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

## Framed-IPv6-Prefix

This AVP contains the IPv6 prefix to be configured for the user. One or more AVPs MAY be used in authorization requests as a hint to the server that a specific IPv6 prefixes are desired.

**AVP Header**  
97 0

## ■ Attributes

**Vendor ID**  
0

**VSA Type**  
97

**AVP Type**  
OctetString

**Group Value**  
N/A

**AVP Flag**  
M

## Framed-IPv6-Route

This AVP contains the ASCII routing information to be configured for the user on the NAS.

**AVP Header**  
99 0

**Vendor ID**  
0

**VSA Type**  
99

**AVP Type**  
UTF8STRING

**Group Value**  
N/A

**AVP Flag**  
N/A

## Framed-IPX-Network

This AVP contains the IPX network number to be configured for the user.

**AVP Header**  
23 0

**Vendor ID**  
0

**VSA Type**  
23

**AVP Type**  
UINT32

**Group Value**  
N/A

**AVP Flag**  
M

---

## Framed-MTU

This AVP contains the Maximum Transmission Unit to be configured for the user, when it is not negotiated by some other means (such as PPP).

**AVP Header**

12 0

**Vendor ID**

0

**VSA Type**

12

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## Framed-Pool

This AVP contains the name of an assigned address pool that SHOULD be used to assign an address for the user.

**AVP Header**

88 0

**Vendor ID**

0

**VSA Type**

88

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## Framed-Protocol

This AVP contains the framing to be used for framed access.

**AVP Header**

7 0

**Vendor ID**

0

**VSA Type**

7

**AVP Type**

**■ Attributes**

ENUM. Supported values are:

- PPP (1)
- SLIP (2)
- AppleTalk-Remote-Access-Protocol\_ARAP (3)
- Gandalf-proprietary-SingleLink\_MultiLink-protocol (4)
- Xylogics-proprietary\_IPX-SLIP (5)
- X75-Synchronous (6)

**Group Value**

N/A

**AVP Flag**

M

## Framed-Route

This AVP contains the ASCII routing information to be configured for the user on the NAS.

**AVP Header**

22 0

**Vendor ID**

0

**VSA Type**

22

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

## Framed-Routing

This AVP contains the routing method for the user when the user is a router to a network.

**AVP Header**

10 0

**Vendor ID**

0

**VSA Type**

10

**AVP Type**

ENUM. Supported values are:

- None (0)
- Send-routing-packets (1)

Listen-for-routing-packets (2)

Send-and-Listen (3)

**Group Value**

N/A

**AVP Flag**

M

---

## From-SIP-Header

This AVP contains the information in the From header

**AVP Header**

644 10415

**Vendor ID**

10415

**VSA Type**

644

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

N/A

---

## Geospatial-Location

This AVP provides location information using the Location Configuration Information (LCI) format.

**AVP Header**

356 13019

**Vendor ID**

13019

**VSA Type**

356

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## GERAN-Vector

This AVP contains Authentication Information for GERAN.

## ■ Attributes

**AVP Header**  
6019 10415

**Vendor ID**  
10415

**VSA Type**  
6019

**AVP Type**  
GROUPED

**Group Value**  
[ ITEM\_NUMBER ]  
[ RAND ]  
[ SRES ]  
[ KC\_KEY ]

**AVP Flag**  
M

## GGSN-Address

GGSN IP address used by the GTP control plane for the context establishment. It is the same as the IP-address of the GGSN that generated the GPRS Charging ID used in the GCDRs.

**AVP Header**  
847 10415

**Vendor ID**  
10415

**VSA Type**  
847

**AVP Type**  
ADDRESS

**Group Value**  
N/A

**AVP Flag**  
M

## Globally-Unique-Address

This AVP represents the UE's address.

**AVP Header**  
300 13019

**Vendor ID**  
13019

**VSA Type**  
300

**AVP Type**  
GROUPED

**Group Value**  
[ Framed\_IP\_Address ]  
[ Address\_Realm ]

**AVP Flag**  
M

---

## GMLC-Address

This AVP contains the IPv4 or IPv6 address of the V-GMLC associated with the serving node.

**AVP Header**  
1474 10415

**Vendor ID**  
10415

**VSA Type**  
1474

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

---

## GMLC-Number

This AVP contains the ISDN number of the GMLC.

**AVP Header**  
1474 10415

**Vendor ID**  
10415

**VSA Type**  
1474

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

## GMLC-Restriction

This attribute contains GMLC Restriction List.

**AVP Header**

1481 10415

**Vendor ID**

10415

**VSA Type**

1481

**AVP Type**

ENUM. Supported values are:

GMLC\_LIST (0)

HOME\_COUNTRY (1)

**Group Value**

N/A

**AVP Flag**

M

## GPRS-Subscription-Data

This AVP contains the information related to the user profile relevant for GPRS.

**AVP Header**

1467 10415

**Vendor ID**

10415

**VSA Type**

1467

**AVP Type**

GROUPED

**Group Value**

[ COMPLETE\_DATA\_LIST\_INCLUDED\_INDICATOR ]

[ PDP\_CONTEXT ]

**AVP Flag**

M

## Granted-QoS

It is used within the Flow-Info AVP to indicate the QoS granted to the UE for a particular IP flow in the high rate packet data radio access network.

**AVP Header**

811 5535

**Vendor ID**

5535

**VSA Type**

811

**AVP Type**

GROUPED

**Group Value**

[ QoS-Class ]

[ Min-Bandwidth-UL ]

[ Min-Bandwidth-DL ]

**AVP Flag**

M

## Granted-Service-Unit

This AVP contains the amount of units that the Diameter credit-control client can provide to the end user until the service must be released or the new Credit-Control-Request must be sent.

**AVP Header**

431 0

**Vendor ID**

0

**VSA Type**

431

**AVP Type**

GROUPED

**Group Value**

[ TARIFF\_TIME\_CHANGE ]

[ TARIFF\_CHANGE\_USAGE ]

[ CC\_TIME ]

[ CC\_MONEY ]

[ CC\_TOTAL\_OCTETS ]

[ CC\_INPUT\_OCTETS ]

[ CC\_OUTPUT\_OCTETS ]

[ CC\_SERVICE\_SPECIFIC\_UNITS ]

**AVP Flag**

M

## G-S-U-Pool-Identifier

Specifies the credit pool from which credit is drawn for this unit type.

**AVP Header**

453 0

## ■ Attributes

**Vendor ID**

0

**VSA Type**

453

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## G-S-U-Pool-Reference

This AVP contains a reference to a credit pool, a unit-type and a multiplier (using the Unit-Value AVP). It is used within Granted-Service-Units AVP to indicate that credit Service-Units AVP to indicate that credit of a particular type is pooled.

**AVP Header**

457 0

**Vendor ID**

0

**VSA Type**

457

**AVP Type**

GROUPED

**Group Value**

[ G\_S\_U\_POOL\_IDENTIFIER ]

[ CC\_UNIT\_TYPE ]

[ UNIT\_VALUE ]

**AVP Flag**

M

## Guaranteed-Bitrate-DL

Defines the guaranteed bit rate allowed for the downlink direction.

**AVP Header**

1025 10415

**Vendor ID**

10415

**VSA Type**

1025

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**  
M

---

## Guaranteed-Bitrate-UL

Defines the guaranteed bit rate allowed for the uplink direction.

**AVP Header**  
1026 10415

**Vendor ID**  
10415

**VSA Type**  
1026

**AVP Type**  
UINT32

**Group Value**  
N/A

**AVP Flag**  
M

---

## HBM-Address

HBM-Address.

**AVP Header**  
1462 10415

**Vendor ID**  
10415

**VSA Type**  
1462

**AVP Type**  
ADDRESS

**Group Value**  
N/A

**AVP Flag**  
M

---

## Home-Agent

Used to convey the HA IPv4 address that the MS requests or the HA IPv4 address that the H-AAA assigns.

**AVP Header**  
3 5535

**Vendor ID**  
5535

## ■ Attributes

**VSA Type**

3

**AVP Type**

ADDRESS

**Group Value**

N/A

**AVP Flag**

M

## Host-IP-Address

This attribute indicates the Mobile station IP address.

**AVP Header**

257 0

**Vendor ID**

0

**VSA Type**

257

**AVP Type**

ADDRESS

**Group Value**

N/A

**AVP Flag**

M

## HPLMN-ODB

This AVP contains a bit mask indicating the HPLMN specific services of a subscriber that are barred by the operator.

**AVP Header**

1418 10415

**Vendor ID**

10415

**VSA Type**

1418

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## HSGW-Address

HSGW IP address. In 12.2 and later releases, this attribute is deprecated.

**AVP Header**

1415 10415

**Vendor ID**

10415

**VSA Type**

1415

**AVP Type**

ADDRESS

**Group Value**

N/A

**AVP Flag**

M

---

## IDA-Flags

The IDA-Flags AVP contains a bit mask.

**AVP Header**

1441 10415

**Vendor ID**

10415

**VSA Type**

1441

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## Identity-Set

Indicates the requested set of IMS Public identities.

**AVP Header**

708 0

**Vendor ID**

0

**VSA Type**

708

**AVP Type**

ENUM

**■ Attributes****Group Value**

N/A

**AVP Flag**

N/A

## Idle-Timeout

Sets the maximum number of consecutive seconds of idle connection allowable to the user before termination of the session or before a prompt is issued.

**AVP Header**

28 0

**Vendor ID**

0

**VSA Type**

28

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## IDR-Flags

Contains a bit mask.

**AVP Header**

1490 10415

**Vendor ID**

10415

**VSA Type**

1490

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## IMEI

This AVP contains the International Mobile Equipment Identity.

**AVP Header**

6003 10415

**Vendor ID**  
10415

**VSA Type**  
6003

**AVP Type**  
UTF8STRING

**Group Value**  
N/A

**AVP Flag**  
M

## Immediate-Response-Preferred

Indicates which type of AV is requested for immediate use in the MME/SGSN.

**AVP Header**  
6015 10415

**Vendor ID**  
10415

**VSA Type**  
6015

**AVP Type**  
UINT32

**Group Value**  
N/A

**AVP Flag**  
M

## IMS-3GPP-Charging-Id

IMS-3GPP-Charging ID.

**AVP Header**  
2 10415

**Vendor ID**  
10415

**VSA Type**  
2

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

---

## IMS-Charging-Identifier

This AVP holds the IMS Charging Identifier (ICID) as generated by an IMS node for a SIP session.

**AVP Header**

841 10415

**Vendor ID**

10415

**VSA Type**

841

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## IMS-Communication-Service-Identifier

Holds the IMS Communication Service Identifier (ICSI) as contained in the P-Asserted-Service header of a SIP request to identify an IMS Communication Service as defined in TS 24.229.

**AVP Header**

1281 10415

**Vendor ID**

10415

**VSA Type**

1281

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## IMS-Information

This grouped AVP allows the transmission of additional IMS service specific information elements.

**AVP Header**

876 10415

**Vendor ID**

10415

**VSA Type**

876

**AVP Type**

GROUPED

**Group Value**

- [ EVENT\_TYPE ]
- [ ROLE\_OF\_NODE ]
- [ NODE\_FUNCTIONALITY ]
- [ USER\_SESSION\_ID ]
- [ CALLING\_PARTY\_ADDRESS ]
- [ CALLED\_PARTY\_ADDRESS ]
- [ CALLED\_ASSERTED\_IDENTITY ]
- [ ASSOCIATED\_URI ]
- [ TIME\_STAMPS ]
- [ APPLICATION\_SERVER\_INFORMATION ]
- [ INTER\_OPERATOR\_IDENTIFIER ]
- [ IMS\_CHARGING\_IDENTIFIER ]
- [ SDP\_SESSION\_DESCRIPTION ]
- [ SDP\_MEDIA\_COMPONENT ]
- [ MESSAGE\_BODY ]
- [ CAUSE\_CODE ]
- [ ACCESS\_NETWORK\_INFORMATION ]
- [ EARLY\_MEDIA\_DESCRIPTION ]

**AVP Flag**

M

---

## IMSI-Unauthenticated-Flag

This attribute indicates whether or not the served IMSI is authenticated.

**AVP Header**

2308 10415

**Vendor ID**

10415

**VSA Type**

2308

**AVP Type**

ENUM. Supported values are:

- AUTHENTICATED (0)
- UNAUTHENTICATED (1)

**Group Value**

N/A

**AVP Flag**

M

---

## Inband-Security-Id

Advertise support of the Security portion of the application.

**AVP Header**

299 0

**Vendor ID**

0

**VSA Type**

299

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## Incoming-Trunk-Group-ID

This AVP identifies the incoming PSTN leg.

**AVP Header**

852 0

**Vendor ID**

0

**VSA Type**

852

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## Integrity-Key

This AVP contains the Integrity Key (IK).

**AVP Header**

626 10415

**Vendor ID**

10415

**VSA Type**

626

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## Inter-Operator-Identifier

This AVP contains the identification of the network neighbors (originating and terminating) as exchanged via SIP signalling. The Inter-Operator-Identifier AVP contains the CIC code present in the Carrier-info message.

**AVP Header**

838 10415

**Vendor ID**

10415

**VSA Type**

838

**AVP Type**

GROUPED

**Group Value**

[ ORIGINATING\_IOI ]

[ TERMINATING\_IOI ]

**AVP Flag**

M

## IP-CAN-Type

This AVP indicate the type of Connectivity Access Network in which the user is connected.

**AVP Header**

1027 10415

**Vendor ID**

10415

**VSA Type**

1027

**AVP Type**

ENUM. Supported values are:

3GPP (0)

DOCSIS (1)

xDSL (2)

WiMAX (3)

3GPP2 (4)

3GPP-EPS (5)

NON-3GPP-EPS (6)

## ■ Attributes

**Group Value**

N/A

**AVP Flag**

M

**IP-MMS**

IP mobility selector.

**AVP Header**

6076 10415

**Vendor ID**

10415

**VSA Type**

6076

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

**IP-Version-Authorized**

Used to indicate whether the MS is authorised for using IPv4 and/or IPv6.

**AVP Header**

11 5535

**Vendor ID**

5535

**VSA Type**

11

**AVP Type**

ENUM. Supported values are:

IPv4\_or\_IPv6 (0)

IPv4\_ONLY (1)

IPv6\_ONLY (2)

**Group Value**

N/A

**AVP Flag**

M

---

## Item-Number

If more than one EPS Vector is included within one Authentication-Info AVP, the Item-Number AVP shall be present within each EPS Vector.

**AVP Header**

1419 10415

**Vendor ID**

10415

**VSA Type**

1419

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## KASME

This AVP contains the KASME (EAP Authentication Vector).

**AVP Header**

1450 10415

**Vendor ID**

10415

**VSA Type**

1450

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## KC-Key

This AVP contains the Ciphering Key.

**AVP Header**

1453 10415

**Vendor ID**

10415

**VSA Type**

1453

**AVP Type**

**■ Attributes**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## Last-CellSector-ID

String contains last Cell ID and Sector ID.

**AVP Header**

1420 10415

**Vendor ID**

10415

**VSA Type**

1420

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

## Last-CellSector-Location

Indicates subscriber last cell/sector location.

**AVP Header**

536 10415

**Vendor ID**

10415

**VSA Type**

536

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

## Latching-Indication

This AVP contains the latching indication.

**AVP Header**

457 13019

**Vendor ID**

13019

**VSA Type**

457

**AVP Type**

ENUM. Supported values are:

LATCH (0)

RELATCH (1)

**Group Value**

N/A

**AVP Flag**

N/A

---

## LCS-Info

This AVP contains LCS related information for a subscriber.

**AVP Header**

1473 10415

**Vendor ID**

10415

**VSA Type**

1473

**AVP Type**

GROUPED

**Group Value**

[ GMLC\_ADDRESS ]

[ LCS\_PRIVACYEXCEPTION ]

[ MO\_LR ]

**AVP Flag**

M

---

## LCS-PrivacyException

This AVP contains the classes of LCS Client that are allowed to locate any target UE.

**AVP Header**

1475 10415

**Vendor ID**

10415

**VSA Type**

1475

**AVP Type**

**■ Attributes**

GROUPED

**Group Value**

- [ SS\_CODE ]
- [ SS\_STATUS ]
- [ NOTIFICATION\_TO\_UE\_USER ]
- [ EXTERNAL\_CLIENT ]
- [ PLMN\_CLIENT ]
- [ SERVICE\_TYPE ]

**AVP Flag**

M

## LI-Information

This AVP holds all the other surveillance AVPs.

**AVP Header**

218 4491

**Vendor ID**

4491

**VSA Type**

218

**AVP Type**

GROUPED

**Group Value**

- [ EVENT\_MESSAGE\_TYPE ]
- [ ELEMENT\_TYPE ]
- [ ELEMENT\_ID ]
- [ TAP\_ID ]
- [ SIP\_MESSAGE ]
- [ DIRECT\_MESSAGE ]
- [ DIRECTION ]
- [ DIALOG\_ID ]
- [ NEW\_DIALOG\_ID ]
- [ CORRELATE\_REASON]
- [ BCID ]

**AVP Flag**

M

## Line-Identifier

This AVP contains a fixed broadband access line identifier associated with the user.

**AVP Header**  
500 13019

**Vendor ID**  
13019

**VSA Type**  
500

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

---

## Local-Sequence-Number

This AVP holds the service data container sequence number; incremented by 1 for each service data container closed.

**AVP Header**  
2063 10415

**Vendor ID**  
10415

**VSA Type**  
2063

**AVP Type**  
UINT32

**Group Value**  
N/A

**AVP Flag**  
M

---

## Location-Information

This AVP contains the location information (or a pointer to such information) in a form that is suitable for the requesting application.

**AVP Header**  
350 13019

**Vendor ID**  
13019

**VSA Type**  
350

**AVP Type**  
GROUPED

**Group Value**  
[ LINE\_IDENTIFIER ]

## ■ Attributes

[ CIVIC\_LOCATION ]  
 [ GEOSPATIAL\_LOCATION ]

**AVP Flag**

M

## Logical-Access-Id

This specifies the identity of the logical access where the user equipment is connected.

**AVP Header**

302 0

**Vendor ID**

0

**VSA Type**

302

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## Loose-Route-Indication

Indicates to the S-CSCF whether or not the loose route mechanism is required to serve the registered Public User Identities.

**AVP Header**

638 10415

**Vendor ID**

10415

**VSA Type**

638

**AVP Type**

ENUM. Supported values are:

LOOSE\_ROUTE\_NOT\_REQUIRED (0)

LOOSE\_ROUTE\_REQUIRED (1)

**Group Value**

N/A

**AVP Flag**

N/A

---

## Mandatory-Capability

This AVP contains single determined mandatory capability of an S-CSCF.

**AVP Header**

604 10415

**Vendor ID**

10415

**VSA Type**

604

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## Max-Requested-Bandwidth

Indicates the maximum subscriber requested bandwidth.

**AVP Header**

313 10415

**Vendor ID**

10415

**VSA Type**

313

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## Max-Requested-Bandwidth-DL

Indicates the maximum requested bandwidth in bits per second for a downlink IP flow.

**AVP Header**

515 10415

**Vendor ID**

10415

**VSA Type**

515

**AVP Type**

UINT32

## ■ Attributes

**Group Value**

N/A

**AVP Flag**

M

## Max-Requested-Bandwidth-UL

Indicates the maximum requested bandwidth in bits per second for an uplink IP flow.

**AVP Header**

516 10415

**Vendor ID**

10415

**VSA Type**

516

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## MBMS-2G-3G-Indicator

Indicates whether the MBMS bearer service will be delivered in 2G only, 3G only or both coverage areas.

**AVP Header**

907 10415

**Vendor ID**

10415

**VSA Type**

907

**AVP Type**

ENUM. Supported values are:

2G (0)

3G (1)

2G\_AND\_3G (2)

**Group Value**

N/A

**AVP Flag**

M

---

## MBMS-BMSC-SSM-IP-Address

Contains the value of BM-SCs IPv4 address for Source Specific Multicasting.

**AVP Header**

918 10415

**Vendor ID**

10415

**VSA Type**

918

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## MBMS-BMSC-SSM-IPv6-Address

Contains the value of BM-SCs IPv6 address for Source Specific Multicasting.

**AVP Header**

919 10415

**Vendor ID**

10415

**VSA Type**

919

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## MBMS-Counting-Information

Contains explicit information about whether the MBMS Counting procedures are applicable for the MBMS Service that is about to start.

**AVP Header**

914 10415

**Vendor ID**

10415

**VSA Type**

914

**AVP Type**

**■ Attributes**

ENUM. Supported values are:

COUNTING\_NOT\_APPLICABLE (0)

COUNTING\_APPLICABLE (1)

**Group Value**

N/A

**AVP Flag**

M

## MBMS-GGSN-Address

Contains the value of GGSN's IPv4 address for user plane data.

**AVP Header**

916 10415

**Vendor ID**

10415

**VSA Type**

916

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

## MBMS-GGSN-IPv6-Address

Contains the value of GGSN's IPv6 address for user plane data.

**AVP Header**

917 10415

**Vendor ID**

10415

**VSA Type**

917

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## MBMS-Required-QoS

Indicates the quality of service required for the MBMS bearer service.

**AVP Header**

913 10415

**Vendor ID**

10415

**VSA Type**

913

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## MBMS-Service-Area

Indicates the area over which the MBMS bearer service has to be distributed

**AVP Header**

903 10415

**Vendor ID**

10415

**VSA Type**

903

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## MBMS-Service-Type

Contains explicit information about the type of service that the BM-SC Start Procedure is about to start.

**AVP Header**

906 10415

**Vendor ID**

10415

**VSA Type**

906

**AVP Type**

ENUM. Supported values are:

## ■ Attributes

MULTICAST (0)

BROADCAST (1)

**Group Value**

N/A

**AVP Flag**

M

## MBMS-Session-Duration

Indicates the estimated session duration, if available.

**AVP Header**

904 10415

**Vendor ID**

10415

**VSA Type**

904

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## MBMS-Session-Identity

Identifies a transmission of a specific MBMS session along with TMGI.

**AVP Header**

908 10415

**Vendor ID**

10415

**VSA Type**

908

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## MBMS-Session-Repetition-number

Contains the session identity repetition number of the MBMS transmission session on the Gmb interface.

**AVP Header**  
912 10415

**Vendor ID**  
10415

**VSA Type**  
912

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

## MBMS-StartStop-Indication

Indicates whether it is session start or stop procedure.

**AVP Header**  
902 10415

**Vendor ID**  
10415

**VSA Type**  
902

**AVP Type**  
ENUM. Supported values are:  
START (0)  
STOP (1)  
UPDATE (2)

**Group Value**  
N/A

**AVP Flag**  
M

## MBMS-Time-To-Data-Transfer

Indicates the expected time between reception of the MBMS Session Start and the commencement of the MBMS Data flow.

**AVP Header**  
911 10415

**Vendor ID**  
10415

**VSA Type**  
911

## ■ Attributes

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

---

## MBMS-User-Data-Mode-Indication

Specifies whether the sending entity supports unicast or multicast mode of operation.

**AVP Header**  
915 10415

**Vendor ID**  
10415

**VSA Type**  
915

**AVP Type**  
ENUM. Supported values are:  
UNICAST (0)  
MULTICAST\_AND\_UNICAST (1)

**Group Value**  
N/A

**AVP Flag**  
M

---

## Media-Component-Description

This AVP contains service information for a single media component within an Application Function (AF) session.

**AVP Header**  
517 10415

**Vendor ID**  
10415

**VSA Type**  
517

**AVP Type**  
GROUPED

**Group Value**  
[ MEDIA\_COMPONENT\_NUMBER ]  
[ MEDIA\_SUB\_COMPONENT ]  
[ AF\_APPLICATION\_IDENTIFIER ]  
[ MEDIA\_TYPE ]  
[ MAX\_REQUESTED\_BANDWIDTH\_UL ]

[ MAX\_REQUESTED\_BANDWIDTH\_DL ]  
 [ FLOW\_STATUS ]  
 [ RS\_BANDWIDTH ]  
 [ RR\_BANDWIDTH ]

**AVP Flag**

M

## Media-Component-Number

This AVP contains the ordinal number of the media component.

**AVP Header**

518 10415

**Vendor ID**

10415

**VSA Type**

518

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## Media-Initiator-Flag

This AVP indicates which party has requested the session modification.

The default value is "0" indicating the called party initiated the modification

- [0] called party
- [1] calling party
- [2] unknown

**AVP Header**

882 10415

**Vendor ID**

10415

**VSA Type**

882

**AVP Type**

ENUM

**Group Value**

N/A

**AVP Flag**

M

---

## Media-Initiator-Party

This AVP enumerated in IMS charging, holds the address (SIP URI or TEL URI) of the party (Public User ID or Public Service ID) who initiates the media action, like adding/removing, connecting/disconnecting the media.

**AVP Header**

1288 10415

**Vendor ID**

10415

**VSA Type**

1288

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## Media-Sub-Component

The requested QoS and filters for the set of IP flows identified by their common Flow-Identifier.

**AVP Header**

519 10415

**Vendor ID**

10415

**VSA Type**

519

**AVP Type**

GROUPED

**Group Value**

[ FLOW\_NUMBER ]

[ FLOW\_DESCRIPTION ]

[ FLOW\_STATUS ]

[ FLOW\_USAGE ]

[ MAX\_REQUESTED\_BANDWIDTH\_UL ]

[ MAX\_REQUESTED\_BANDWIDTH\_DL ]

**AVP Flag**

M

---

## Media-Type

The media types indicate the type of media in the same way as the SDP media types with the same names like AUDIO, VIDEO.

**AVP Header**

520 10415

**Vendor ID**

10415

**VSA Type**

520

**AVP Type**

ENUM

**Group Value**

N/A

**AVP Flag**

M

---

## MEID

This AVP contains the International Mobile Equipment Identity.

**AVP Header**

6110 10415

**Vendor ID**

10415

**VSA Type**

6110

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## Message-Body

This grouped AVP holds information about the message bodies including user-to-user data.

**AVP Header**

889 10415

**Vendor ID**

10415

**VSA Type**

889

**AVP Type**

## ■ Attributes

GROUPED

**Group Value**

- [ CONTENT\_TYPE ]
- [ CONTENT\_LENGTH ]
- [ CONTENT\_DISPOSITION ]
- [ ORIGINATOR ]

**AVP Flag**

M

## Metering-Method

Defines what parameters shall be metered for offline charging.

**AVP Header**

1007 10415

**Vendor ID**

10415

**VSA Type**

1007

**AVP Type**

ENUM. Supported values are:

- DURATION (0)
- VOLUME (1)
- DURATION\_VOLUME (2)

**Group Value**

N/A

**AVP Flag**

M

## Min-Bandwidth-DL

This AVP contains the requested/granted data rate information in bits per second for the mobile in the downlink direction for the associated IP flow.

**AVP Header**

1012 5535

**Vendor ID**

5535

**VSA Type**

1012

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**  
M

---

## Min-Bandwidth-UL

This AVP contains the requested/granted data rate information in bits per second for the mobile in the uplink direction for the associated IP flow.

**AVP Header**  
1013 5535

**Vendor ID**  
5535

**VSA Type**  
1013

**AVP Type**  
UINT32

**Group Value**  
N/A

**AVP Flag**  
M

---

## MIP-Feature-Vector

Is added with flag values set by the foreign agent or by the AAAF owned by the same administrative domain as the foreign agent. The foreign agent SHOULD include MIP-Feature-Vector AVP within the AMR message it sends to the AAAF.

**AVP Header**  
337 10415

**Vendor ID**  
10415

**VSA Type**  
337

**AVP Type**  
UINT32

**Group Value**  
N/A

**AVP Flag**  
M

---

## MIP-Home-Agent-Address

This AVP contains the mobile node's home agent IP address.

**AVP Header**  
334 10415

## ■ Attributes

**Vendor ID**  
10415

**VSA Type**  
334

**AVP Type**  
ADDRESS

**Group Value**  
N/A

**AVP Flag**  
M

## MIP-Home-Agent-Address-IETF

This specifies the IPv6 or IPv4 address of the MIPv6 HA.

**AVP Header**  
334 0

**Vendor ID**  
0

**VSA Type**  
334

**AVP Type**  
ADDRESS

**Group Value**  
N/A

**AVP Flag**  
M

## MIP-Home-Agent-Host

This AVP contains the identity of the assigned MIPv6 HA.

**AVP Header**  
348 0

**Vendor ID**  
0

**VSA Type**  
348

**AVP Type**  
GROUPED

**Group Value**  
[ DESTINATION\_REALM ]  
[ DESTINATION\_HOST ]

**AVP Flag**  
M

---

## MIP-Mobile-Node-Address

This AVP contains the mobile node's home IP address.

**AVP Header**

333 10415

**Vendor ID**

10415

**VSA Type**

333

**AVP Type**

ADDRESS

**Group Value**

N/A

**AVP Flag**

M

---

## MIP6-Agent-Info

This AVP contains necessary information to assign a HA to the MN. It can be an IP address or Fully Qualified Domain Name (FQDN).

**AVP Header**

486 0

**Vendor ID**

0

**VSA Type**

486

**AVP Type**

GROUPED

**Group Value**

[ MIP\_HOME\_AGENT\_ADDRESS\_IETF ]

[ MIP\_HOME\_AGENT\_HOST ]

[ MIP6\_HOME\_LINK\_PREFIX ]

**AVP Flag**

M

---

## MIP6-Feature-Vector

This is the subset of the MIPv6 Features supported.

**AVP Header**

6062 0

**Vendor ID**

0

## ■ Attributes

**VSA Type**

6062

**AVP Type**

UINT64

**Group Value**

N/A

**AVP Flag**

M

---

## MIP6-Home-Link-Prefix

This AVP contains the Mobile IPv6 home network prefix information in a network byte order.

**AVP Header**

6061 0

**Vendor ID**

0

**VSA Type**

6061

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## MME-Service-Type

MME service type.

**AVP Header**

1483 10415

**Vendor ID**

10415

**VSA Type**

1483

**AVP Type**

GROUPED

**Group Value**

[ SERVICETYPEIDENTITY ]

[ GMLC\_RESTRICTION ]

[ NOTIFICATION\_TO\_UE\_USER ]

**AVP Flag**

M

---

## MO-LR

This AVP defines the classes of Mobile Originating Location Request (MO-LR) for which a subscription exists for a particular MS.

**AVP Header**

1485 10415

**Vendor ID**

10415

**VSA Type**

1485

**AVP Type**

GROUPED

**Group Value**

[ SS\_CODE ]

[ SS\_STATUS ]

**AVP Flag**

M

---

## Mobile-Node-Identifier

Contains MN-NAI identifying the user in EPS network.

**AVP Header**

89 0

**Vendor ID**

0

**VSA Type**

89

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## Monitoring-Key

This attribute serves as an identifier to a usage monitoring control instance. This AVP is used for usage monitoring control purposes.

**AVP Header**

1066 10415

**Vendor ID**

10415

**VSA Type**

## ■ Attributes

1066

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

N/A

## MSISDN

This AVP contains an MSISDN, in international number format as described in ITU-T.

**AVP Header**

701 0

**Vendor ID**

0

**VSA Type**

701

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## Multiple-Auth-Profile

This attribute indicates Multiple Authentication requirements for a particular user.

**AVP Header**

30 5535

**Vendor ID**

5535

**VSA Type**

30

**AVP Type**

ENUM

**Group Value**

N/A

**AVP Flag**

M

## Multiple-Auth-Support

This AVP indicates the support of the Multiple Authentication at the SRNC and AGW.

**AVP Header**

29 5535

**Vendor ID**

5535

**VSA Type**

29

**AVP Type**

ENUM

**Group Value**

N/A

**AVP Flag**

M

## Multiple-Registration-Indication

Indicates to the HSS whether or not the request is related to a multiple registration

**AVP Header**

648 10415

**Vendor ID**

10415

**VSA Type**

648

**AVP Type**

ENUM. Supported values are:

NOT\_MULTIPLE\_REGISTRATION (0)

MULTIPLE\_REGISTRATION (1)

**Group Value**

N/A

**AVP Flag**

N/A

## Multiple-Services-Credit-Control

This AVP contains the AVPs related to the independent credit-control of multiple services feature.

**AVP Header**

456 0

**Vendor ID**

0

**VSA Type**

## ■ Attributes

456

**AVP Type**

GROUPED

**Group Value**

- [ REQUESTED\_SERVICE\_UNIT ]
- [ GRANTED\_SERVICE\_UNIT ]
- [ USED\_SERVICE\_UNIT ]
- [ TARIFF\_CHANGE\_USAGE ]
- [ SERVICE\_IDENTIFIER ]
- [ RATING\_GROUP ]
- [ G\_S\_U\_POOL\_REFERENCE ]
- [ VALIDITY\_TIME ]
- [ RESULT\_CODE ]
- [ FINAL\_UNIT\_INDICATION ]

**AVP Flag**

M

## Multiple-Services-Indicator

Indicates support for independent credit-control of multiple services within the session.

**AVP Header**

455 0

**Vendor ID**

0

**VSA Type**

455

**AVP Type**

ENUM. Supported values are:

- MULTIPLE\_SERVICES\_NOT\_SUPPORTED (0)
- MULTIPLE\_SERVICES\_SUPPORTED (1)

**Group Value**

N/A

**AVP Flag**

M

## Multi-Round-Time-Out

Present in application-specific authorization answer messages whose Result-Code AVP is set to “DIAMETER\_MULTI\_ROUND\_AUTH”.

**AVP Header**

272 0

**Vendor ID**

0

**VSA Type**

272

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

N/A

## NAS-Filter-Rule

Provides filter rules that need to be configured on the NAS for the user.

**AVP Header**

400 0

**Vendor ID**

0

**VSA Type**

400

**AVP Type**

IPFILTERRULE

**Group Value**

N/A

**AVP Flag**

M

## NAS-Identifier

This AVP contains the identity of the NAS providing service to the user.

**AVP Header**

32 0

**Vendor ID**

0

**VSA Type**

32

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## NAS-IP-Address

This AVP contains the IP address of the NAS providing service to the user.

**AVP Header**

4 0

**Vendor ID**

0

**VSA Type**

4

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## NAS-IPv6-Address

This AVP contains the IPv6 address of the NAS providing service to the user.

**AVP Header**

95 0

**Vendor ID**

0

**VSA Type**

95

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## NAS-Port

This AVP contains the physical or virtual port number of the NAS which is authenticating the user.

**AVP Header**

5 0

**Vendor ID**

0

**VSA Type**

5

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## NAS-Port-Id

Consists of ASCII text identifying the port of the NAS authenticating the user.

**AVP Header**

87 0

**Vendor ID**

0

**VSA Type**

87

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

## NAS-Port-Type

This AVP contains the type of the port on which the NAS is authenticating the user.

**AVP Header**

61 0

**Vendor ID**

0

**VSA Type**

61

**AVP Type**

ENUM. Supported values are:

Async (0)

Sync (1)

ISDN\_Sync (2)

ISDN\_Async\_V120 (3)

ISDN\_Async\_V110 (4)

Virtual (5)

PIAFS (6)

HDLC\_Clear\_Channel (7)

X25 (8)

**■ Attributes**

X75 (9)  
 G3\_Fax (10)  
 ADSL-CAP-AsymmetricDSL\_Carrierless-Amplitude-Phase-Modulation (12)  
 ADSL-DMT-AsymmetricDSL-Discrete-Multi-Tone (13)  
 IDSL-ISDN-Digital-Subscriber-Line (14)  
 Ethernet (15)  
 xDSL-Digital-Subscriber-Line-of-unknown-type (16)  
 Cable (17)  
 Wireless-Other (18)  
 Wireless-IEEE802\_11 (19)  
 Token-Ring\_RAD802\_1X (20)  
 FDDI\_RAD802\_1X (21)  
 Wireless-CDMA2000 (22)  
 Wireless-UMTS (23)  
 Wireless-1X-EV (24)  
 IAPP\_IEEE-802\_11f (25)

**Group Value**

N/A

**AVP Flag**

M

---

## Network-Access-Mode

Defines whether the subscriber is registered to get access to the CS, PS network or to both networks.

**AVP Header**

1417 10415

**Vendor ID**

10415

**VSA Type**

1417

**AVP Type**

ENUM. Supported values are:

PACKET\_AND\_CIRCUIT (0)  
 ONLY\_CIRCUIT (1)  
 ONLY\_PACKET(2)

**Group Value**

N/A

**AVP Flag**

M

---

## Network-Element-Type

Network element type.

**AVP Header**

1461 10415

**Vendor ID**

10415

**VSA Type**

1461

**AVP Type**

ENUM. Supported values are:

MME (0)

SGSN (1)

Serving-GW (2)

PDN-GW (3)

eNodeB (4)

RNC (5)

**Group Value**

N/A

**AVP Flag**

M

---

## Network-Request-Support

Indicates the UE and network support of the network requested bearer control mode.

**AVP Header**

1024 10415

**Vendor ID**

10415

**VSA Type**

1024

**AVP Type**

ENUM. Supported values are:

NETWORK\_REQUEST\_NOT\_SUPPORTED (0)

NETWORK\_REQUEST\_SUPPORTED (1)

**Group Value**

N/A

**AVP Flag**

M

## New-Dialog-Id

Contains the SIP dialog identifier in the form: Call-ID=x;FTag=y;TTag=z, where x is the value of the SIP Call-ID header, y is the contents of the From header tag, and z is the contents of the To header tag. If the To header tag value is not present in the SIP message then TTag field MUST not be present in the AVP.

**AVP Header**

219 4491

**Vendor ID**

4491

**VSA Type**

219

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

## Node-Functionality

This AVP includes the functionality identifier of the node where the cause code was generated.

**AVP Header**

862 0

**Vendor ID**

0

**VSA Type**

862

**AVP Type**

ENUM. Supported values are:

S-CSCF (0)

P-CSCF (1)

I-CSCF (2)

**Group Value**

N/A

**AVP Flag**

M

## Node-Id

This AVP contains the operator configurable identifier string for the node that had generated the ACR.

**AVP Header**

2064 10415

<b>Vendor ID</b>	10415
<b>VSA Type</b>	2064
<b>AVP Type</b>	UTF8STRING
<b>Group Value</b>	N/A
<b>AVP Flag</b>	M

---

## NOR-Flags

The NOR-Flags AVP contains a bit mask.

<b>AVP Header</b>	1443 10415
<b>Vendor ID</b>	10415
<b>VSA Type</b>	1443
<b>AVP Type</b>	UINT32
<b>Group Value</b>	N/A
<b>AVP Flag</b>	M

---

## Nortel-Data-Reference

Indicates the type of the Nortel-specific user data requested or updated in the UDR and PUR operation.

<b>AVP Header</b>	301 0
<b>Vendor ID</b>	0
<b>VSA Type</b>	301
<b>AVP Type</b>	ENUM
<b>Group Value</b>	N/A
<b>AVP Flag</b>	M

---

## Notification-To-UE-User

Notification-To-UE-User

**AVP Header**

1478 10415

**Vendor ID**

10415

**VSA Type**

1478

**AVP Type**

ENUM. Supported values are:

NOTIFY\_LOCATION\_ALLOWED (0)

NOTIFYANDVERIFY\_ALLOWED\_IF\_NO\_RESPONSE (1)

NOTIFYANDVERIFY\_NOT\_ALLOWED\_IF\_NO\_RESPONSE (2)

LOCATION\_NOT\_ALLOWED (3)

**Group Value**

N/A

**AVP Flag**

M

---

## Number-Of-Requested-Vectors

Contains the number of AVs the MME is prepared to receive.

**AVP Header**

6013 10415

**Vendor ID**

10415

**VSA Type**

6013

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## Number-Portability-Routing-Information

This AVP contains information on routing number received by S-CSCF during number portability look-up (ENUM/DNS).

**AVP Header**

2024 10415

<b>Vendor ID</b>	10415
<b>VSA Type</b>	2024
<b>AVP Type</b>	UTF8STRING
<b>Group Value</b>	N/A
<b>AVP Flag</b>	M

---

## Offline

Defines whether the offline charging interface from the TPF for the associated charging rule shall be enabled.

<b>AVP Header</b>	1008 10415
<b>Vendor ID</b>	10415
<b>VSA Type</b>	1008
<b>AVP Type</b>	ENUM. Supported values are:
	DISABLE (0)
	ENABLE (1)
<b>Group Value</b>	N/A
<b>AVP Flag</b>	M

---

## Offline-Charging

Holds the parameters required for offline charging.

<b>AVP Header</b>	1278 10415
<b>Vendor ID</b>	10415
<b>VSA Type</b>	1278
<b>AVP Type</b>	GROUPED
<b>Group Value</b>	[ RULEBASE_ID ]

## ■ Attributes

[ QUOTA\_CONSUMPTION\_TIME ]  
 [ TIME\_QUOTA\_MECHANISM ]  
 [ ENVELOPE\_REPORTING ]  
 [ MULTIPLE\_SERVICES\_CREDIT\_CONTROL ]

**AVP Flag**

M

**Online**

Defines whether the online charging interface from the TPF for the associated charging rule shall be enabled.

**AVP Header**

1009 10415

**Vendor ID**

10415

**VSA Type**

1009

**AVP Type**

ENUM. Supported values are:

DISABLE (0)

ENABLE (1)

**Group Value**

N/A

**AVP Flag**

M

**OMC-Id**

OMC ID.

**AVP Header**

1466 10415

**Vendor ID**

10415

**VSA Type**

1466

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## Operator-Determined-Barring

Contains a bit mask indicating the services of a subscriber that are barred by the operator.

**AVP Header**

1425 10415

**Vendor ID**

10415

**VSA Type**

1425

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## Optional-Capability

This AVP contains single determined optional capability of an S-CSCF.

**AVP Header**

605 10415

**Vendor ID**

10415

**VSA Type**

605

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## Originating-IOI

This AVP holds the Inter Operator Identifier for the originating network as generated by the S-CSCF in the home network of the originating end user.

**AVP Header**

839 0

**Vendor ID**

0

**VSA Type**

839

**AVP Type**

**■ Attributes**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

## Originating-Line-Info

Sent by the NAS system to convey information about the origin of the call from an SS7 system.

**AVP Header**

94 0

**Vendor ID**

0

**VSA Type**

94

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

N/A

## Originating-Request

Indicates that the request is related to an AS originating SIP request in the Location-Information-Request operation.

**AVP Header**

633 10415

**Vendor ID**

10415

**VSA Type**

633

**AVP Type**

ENUM. Supported values are:

ORIGINATING (0)

**Group Value**

N/A

**AVP Flag**

M

## Originator

This AVP indicates the originating party of the message body.

The following values are defined:

- Calling Party (0)
- Called Party (1)

**AVP Header**

864 10415

**Vendor ID**

10415

**VSA Type**

864

**AVP Type**

ENUM

**Group Value**

N/A

**AVP Flag**

M

## Origin-Host

The endpoint that originated the Diameter message.

**AVP Header**

264 0

**Vendor ID**

0

**VSA Type**

264

**AVP Type**

DIAMIDENT

**Group Value**

N/A

**AVP Flag**

M

## Origin-Realm

The realm of the originator of any Diameter message, and is present in all messages.

**AVP Header**

296 0

**Vendor ID**

0

**VSA Type**

296

**AVP Type**

## ■ Attributes

DIAMIDENT

**Group Value**

N/A

**AVP Flag**

M

## Origin-State-Id

The Origin-State-Id AVP is a monotonically increasing value that is advanced whenever a Diameter entity restarts with loss of previous state, for example upon reboot. Origin-State-Id MAY be included in any Diameter message, including CER.

**AVP Header**

278 0

**Vendor ID**

0

**VSA Type**

278

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## Outgoing-Trunk-Group-ID

This AVP identifies the outgoing PSTN leg.

**AVP Header**

853 0

**Vendor ID**

0

**VSA Type**

853

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

## Packet-Filter-Content

Contains the content of the packet filter as requested by the UE and required by the PCRF to create the PCC rules.

<b>AVP Header</b>	
1059 10415	
<b>Vendor ID</b>	
10415	
<b>VSA Type</b>	
1059	
<b>AVP Type</b>	
IPFILTERRULE	
<b>Group Value</b>	
N/A	
<b>AVP Flag</b>	
M	

---

## Packet-Data-Flow-Info

This AVP is unique within the context of an IP-CAN session for the IP flow(s) given within the same Packet-Data-Flow-Info AVP.

<b>AVP Header</b>	
405 24757	
<b>Vendor ID</b>	
24757	
<b>VSA Type</b>	
405	
<b>AVP Type</b>	
GROUPED	
<b>Group Value</b>	
[ PDFID ]	
[ PRECEDENCE ]	
[ FLOW_DESCRIPTION ]	
[ WIMAX_QOS_INFORMATION ]	
<b>AVP Flag</b>	
M	

---

## Packet-Filter-Identifier

Indicates identity of the packet filter. The packet filter identifier is assigned by the PCRF and within the scope of the PCRF is unique per UE.

**AVP Header**

1060 10415

**Vendor ID**

10415

**VSA Type**

1060

**■ Attributes**

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

## Packet-Filter-Information

This AVP contains the information from a single packet filter sent from the PCEF to the PCRF.

**AVP Header**  
1061 10415

**Vendor ID**  
10415

**VSA Type**  
1061

**AVP Type**  
GROUPED

**Group Value**  
[ PACKET\_FILTER\_IDENTIFIER ]  
[ PRECEDENCE ]  
[ PACKET\_FILTER\_CONTENT ]  
[ TOS\_TRAFFIC\_CLASS ]  
[ SECURITY\_PARAMETER\_INDEX ]  
[ FLOW\_LABEL ]

**AVP Flag**  
M

## Packet-Filter-Operation

Indicates a UE initiated resource operation that causes a request for PCC rules.

**AVP Header**  
1062 10415

**Vendor ID**  
10415

**VSA Type**  
1062

**AVP Type**  
ENUM. Supported values are:  
DELETION (0)  
ADDITION (1)

MODIFICATION (2)

**Group Value**

N/A

**AVP Flag**

M

## Packet-Interval

This AVP indicates the packetization time in millisecond which should be used to calculate the polling or grant interval.

**AVP Header**

414 24757

**Vendor ID**

24757

**VSA Type**

414

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## Packet-Size

This AVP indicates the length in bytes of the IP Packet including the IP-header in case of IP-flows where packets have a fixed size.

**AVP Header**

415 24757

**Vendor ID**

24757

**VSA Type**

415

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## Paging-Group-Id

**AVP Header**

1001 0

## ■ Attributes

<b>Vendor ID</b>	0
<b>VSA Type</b>	1001
<b>AVP Type</b>	UINT32
<b>Group Value</b>	N/A
<b>AVP Flag</b>	M

---

Path

This AVP contains a comma separated list of SIP proxies in the Path header.

<b>AVP Header</b>	640 10415
<b>Vendor ID</b>	10415
<b>VSA Type</b>	640
<b>AVP Type</b>	OCTETSTRING
<b>Group Value</b>	N/A
<b>AVP Flag</b>	N/A

---

PCC-Rule-Status

This AVP describes the status of a Policy and Charging Control (PCC) Rule.

<b>AVP Header</b>	1019 5535
<b>Vendor ID</b>	5535
<b>VSA Type</b>	1019
<b>AVP Type</b>	ENUM. Supported values are:

ACTIVE (0) - This value is used to indicate that the PCC rule(s) are successfully installed (for those provisioned from Policy and Charging Rule Functions (PCRF)) or activated (for those pre-provisioned in Access Gateway (AGW)).

INACTIVE (1) - This value is used to indicate that the PCC rule(s) are removed (for those provisioned from PCRF) or inactive (for those pre-provisioned in AGW).

TEMPORARILY INACTIVE (2) - This value is used to indicate that, for some reason (for example, loss of IP flow), already installed or activated PCC rules are temporary disabled.

**Group Value**

N/A

**AVP Flag**

M

## PDFID

This value matches all records from the same packet data flow.

**AVP Header**

26 24757

**Vendor ID**

24757

**VSA Type**

26

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## PDG-Address

This AVP contains the PDG IP address.

**AVP Header**

895 10415

**Vendor ID**

10415

**VSA Type**

895

**AVP Type**

ADDRESS

**Group Value**

N/A

**AVP Flag**

M

## PDG-Charging-Id

This AVP contains the charging identifier generated by the PDG for the tunnel. Charging identifier is generated at tunnel establishment and transferred to 3GPP AAA Server.

**■ Attributes**

**AVP Header**  
896 10415

**Vendor ID**  
10415

**VSA Type**  
896

**AVP Type**  
UINT32

**Group Value**  
N/A

**AVP Flag**  
M

## PDN-Connection-ID

Contains the charging identifier to identify different records belonging to same PDN connection.

**AVP Header**  
2050 10415

**Vendor ID**  
10415

**VSA Type**  
2050

**AVP Type**  
UINT32

**Group Value**  
N/A

**AVP Flag**  
M

## PDN-GW-Address

IP address of the PDN GW and this IP address shall be used as the PDN GW IP address.

**AVP Header**  
6041 10415

**Vendor ID**  
10415

**VSA Type**  
6041

**AVP Type**  
ADDRESS

**Group Value**  
N/A

**AVP Flag**

M

---

## PDN-GW-Allocation-Type

PDN-GW allocation type.

**AVP Header**

1438 10415

**Vendor ID**

10415

**VSA Type**

1438

**AVP Type**

ENUM. Supported values are:

STATIC (0)

DYNAMIC (1)

**Group Value**

N/A

**AVP Flag**

M

---

## PDN-GW-Identity

PDN-GW identity.

**AVP Header**

6044 10415

**Vendor ID**

10415

**VSA Type**

6044

**AVP Type**

GROUPED

**Group Value**

[ PDN\_GW\_ADDRESS ]

[ PDN\_GW\_NAME ]

**AVP Flag**

M

---

## PDN-GW-Name

FQDN which is used to derive the PDN GW IP address using Domain Name Service function.

**AVP Header**

6042 10415

## ■ Attributes

<b>Vendor ID</b>	10415
<b>VSA Type</b>	6042
<b>AVP Type</b>	UTF8STRING
<b>Group Value</b>	N/A
<b>AVP Flag</b>	M

---

## PDN-Type

This attribute indicates the address type of PDN. It can be IPv4,IPV6 or both.

<b>AVP Header</b>	1456 10415
<b>Vendor ID</b>	10415
<b>VSA Type</b>	1456
<b>AVP Type</b>	ENUM. Supported values are:
IPv4 (0)	
IPv6 (1)	
IPv4v6 (2)	
<b>Group Value</b>	N/A
<b>AVP Flag</b>	M

---

## PDP-Address

This AVP contains the PDP context address.

<b>AVP Header</b>	1227 10415
<b>Vendor ID</b>	10415
<b>VSA Type</b>	1227
<b>AVP Type</b>	ADDRESS
<b>Group Value</b>	

N/A

**AVP Flag**  
M

---

## PDP-Context

This AVP contains the list of PDP contexts to which a user has subscribed.

**AVP Header**  
1469 10415

**Vendor ID**  
10415

**VSA Type**  
1469

**AVP Type**  
GROUPED

**Group Value**  
[ CONTEXT\_IDENTIFIER ]  
[ PDP\_TYPE ]  
[ QOS\_SUBSCRIBED ]  
[ VPLMN\_DYNAMIC\_ADDRESS\_ALLOWED ]  
[ SERVICE\_SELECTION ]  
[ 3GPP\_CHARGING\_CHARACTERISTICS ]

**AVP Flag**  
M

---

## PDP-Context-Type

This AVP contains the type of PDP Context.

**AVP Header**  
1247 10415

**Vendor ID**  
10415

**VSA Type**  
1247

**AVP Type**  
ENUM

**Group Value**  
N/A

**AVP Flag**  
M

## PDP-Session-Operation

This value is used to report in an indication of bearer termination that this indication refers to the last PDP context within a PDP session. It is only applicable for GPRS.

**AVP Header**

1015 10415

**Vendor ID**

10415

**VSA Type**

1015

**AVP Type**

ENUM

**Group Value**

N/A

**AVP Flag**

M

## PDP-Type

This AVP indicates the type of protocol that is used by MS.

**AVP Header**

1470 10415

**Vendor ID**

10415

**VSA Type**

1470

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## PGW-Address

P-GW IP address. In 12.2 and later releases, this attribute is deprecated.

**AVP Header**

1405 10415

**Vendor ID**

10415

**VSA Type**

1405

**AVP Type**

ADDRESS

**Group Value**

N/A

**AVP Flag**

M

## PGW-MCC-MNC

MCC MNC of the network to which the P-GW belongs.

**AVP Header**

1406 10415

**Vendor ID**

10415

**VSA Type**

1406

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## PGW-Type

Type of P-GW of current flow.

**AVP Header**

7002 10415

**Vendor ID**

10415

**VSA Type**

7002

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## Physical-Access-Id

This AVP contains the identity of the physical access where the user equipment is connected.

**AVP Header**

**■ Attributes**

313 0

**Vendor ID**

0

**VSA Type**

313

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

## PLMN-Client

PLMN client.

**AVP Header**

1482 10415

**Vendor ID**

10415

**VSA Type**

1482

**AVP Type**

ENUM. Supported values are:

BROADCAST\_SERVICE (0)

O\_AND\_M\_HPLMN (1)

O\_AND\_M\_VPLMN (2)

ANONYMOUS\_LOCATION (3)

TARGET\_UE\_SUBSCRIBED\_SERVICE (4)

**Group Value**

N/A

**AVP Flag**

M

## PMIP6-MAG-Address

This AVP contains IP address of MAG.

**AVP Header**

6070 10415

**Vendor ID**

10415

**VSA Type**

6070

**AVP Type**  
ADDRESS

**Group Value**  
N/A

**AVP Flag**  
M

## Port-Limit

Sets the maximum number of ports the NAS provides to the user.

**AVP Header**  
62 0

**Vendor ID**  
0

**VSA Type**  
62

**AVP Type**  
UINT32

**Group Value**  
N/A

**AVP Flag**  
M

## Pre-emption-Capability

Indicates whether a service data flow can get resources that were already assigned to another service data flow with a lower priority level.

**AVP Header**  
1047 10415

**Vendor ID**  
10415

**VSA Type**  
1047

**AVP Type**  
ENUM. Supported values are:

PRE-EMPTION\_CAPABILITY\_ENABLED (0)

PRE-EMPTION\_CAPABILITY\_DISABLED (1)

**Group Value**  
N/A

**AVP Flag**  
M

## Pre-emption-Vulnerability

Indicates whether a service data flow can loose the resources assigned to it in order to admit a service data flow with higher priority level.

**AVP Header**

1048 10415

**Vendor ID**

10415

**VSA Type**

1048

**AVP Type**

ENUM. Supported values are:

PRE-EMPTION\_VULNERABILITY\_ENABLED (0)

PRE-EMPTION\_VULNERABILITY\_DISABLED (1)

**Group Value**

N/A

**AVP Flag**

M

## Precedence

Defines the precedence of a charging rule in case of overlapping charging rules.

**AVP Header**

1010 10415

**Vendor ID**

10415

**VSA Type**

1010

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## Primary-Charging-Collection-Function-Name

Defines the address of the primary offline charging system for the bearer.

**AVP Header**

621 10415

**Vendor ID**

10415

**VSA Type**

621

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## Primary-Event-Charging-Function-Name

This attribute specifies the address or name of the primary online charging system server for the bearer.

**AVP Header**

619 10415

**Vendor ID**

10415

**VSA Type**

619

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## Priority-Level

This AVP is used to decide whether a bearer establishment or modification request can be accepted or needs to be rejected in case of resource limitations.

**AVP Header**

1046 10415

**Vendor ID**

10415

**VSA Type**

1046

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## Product-Name

This AVP contains the vendor assigned name for the product.

**AVP Header**

269 0

**Vendor ID**

0

**VSA Type**

269

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## Proxy-Host

This AVP contains the identity of the host that added the Proxy-Info AVP.

**AVP Header**

280 0

**Vendor ID**

0

**VSA Type**

280

**AVP Type**

DIAMIDENT

**Group Value**

N/A

**AVP Flag**

M

---

## Proxy-Info

The Proxy-Info AVP allows stateless agents to add local state to a Diameter request.

**AVP Header**

284 0

**Vendor ID**

0

**VSA Type**

284

**AVP Type**

GROUPED

**Group Value**

- [ Proxy-Host ]
- [ Proxy-State ]

**AVP Flag**

- M

## Proxy-State

The Proxy-State AVP contains state local information, and MUST be treated as opaque data.

**AVP Header**

- 33 0

**Vendor ID**

- 0

**VSA Type**

- 33

**AVP Type**

- UTF8STRING

**Group Value**

- N/A

**AVP Flag**

- M

## PS-Append-Free-Format-Data

This AVP indicates if the information sent in the PS-Free-Format-Data AVP must be appended to the PS-free-format-data stored for the online-session.

**AVP Header**

- 867 10415

**Vendor ID**

- 10415

**VSA Type**

- 867

**AVP Type**

ENUM. Supported values are:

- APPEND (0)

- OVERWRITE (1)

**Group Value**

- N/A

**AVP Flag**

- M

---

## PS-Free-Format-Data

This AVP holds online charging session specific data.

**AVP Header**

866 10415

**Vendor ID**

10415

**VSA Type**

866

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## PS-Furnish-Charging-Information

This grouped AVP contains online charging session specific information.

**AVP Header**

865 10415

**Vendor ID**

10415

**VSA Type**

865

**AVP Type**

GROUPED

**Group Value**

[ 3GPP\_CHARGING\_ID ]

[ PS\_FREE\_FORMAT\_DATA ]

[ PS\_APPEND\_FREE\_FORMAT ]

**AVP Flag**

M

---

## PS-Information

Its purpose is to allow the transmission of additional PS service specific information elements.

**AVP Header**

874 10415

**Vendor ID**

10415

**VSA Type**

874

**AVP Type**

GROUPED

**Group Value**

- [ 3GPP\_CHARGING\_ID ]
- [ 3GPP\_PDP\_TYPE ]
- [ PDP\_ADDRESS ]
- [ 3GPP\_GPRS\_QOS\_NEGOTIATED\_PROFILE ]
- [ 3GPP\_SGSN\_ADDRESS ]
- [ 3GPP\_GGSN\_ADDRESS ]
- [ 3GPP(CG)\_ADDRESS ]
- [ 3GPP\_IMSI\_MCC\_MNC ]
- [ 3GPP\_GGSN\_MCC\_MNC ]
- [ 3GPP\_NSAPI ]
- [ CALLED\_STATION\_ID ]
- [ 3GPP\_SESSION\_STOP\_INDICATOR ]
- [ 3GPP\_SELECTION\_MODE ]
- [ 3GPP\_CHARGING\_CHARACTERISTICS ]
- [ 3GPP\_SGSN\_MCC\_MNC ]
- [ 3GPP\_RAT\_TYPE ]
- [ PDP\_CONTEXT\_TYPE ]

**AVP Flag**

M

**PSCID**

Contains the P-GW Session Correlation ID.

**AVP Header**

1450 10415

**Vendor ID**

10415

**VSA Type**

1450

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## PUA-Flags

The PUA-Flags AVP contains a bit mask.

**AVP Header**

1442 10415

**Vendor ID**

10415

**VSA Type**

1442

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## Public-Identity

This AVP contains the public identity of a user in the IMS.

**AVP Header**

601 10415

**Vendor ID**

10415

**VSA Type**

601

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## QoS-Capability

QoS Capability

**AVP Header**

6063 0

**Vendor ID**

0

**VSA Type**

6063

**AVP Type**

GROUPED

**Group Value**

[ QOS\_PROFILE\_TEMPLATE ]  
 [ VENDOR\_SPECIFIC\_QOS\_PROFILE\_TEMPLATE ]

**AVP Flag**

M

## QoS-Class

Defines the authorized traffic class for the PDP context.

**AVP Header**

1017 10415

**Vendor ID**

10415

**VSA Type**

1017

**AVP Type**

ENUM

**Group Value**

N/A

**AVP Flag**

M

## QoS-Class-Identifier

Identifies a set of IP-CAN specific QoS parameters that define the authorized QoS.

**AVP Header**

1028 10415

**Vendor ID**

10415

**VSA Type**

1028

**AVP Type**

ENUM. Supported values are:

TRAFFIC\_CLASS\_A (1)  
 TRAFFIC\_CLASS\_B (2)  
 TRAFFIC\_CLASS\_C (3)  
 TRAFFIC\_CLASS\_D (4)  
 TRAFFIC\_CLASS\_E (5)  
 TRAFFIC\_CLASS\_F (6)  
 TRAFFIC\_CLASS\_G (7)  
 TRAFFIC\_CLASS\_H (8)

**■ Attributes****TRAFFIC\_CLASS\_I (9)**

In 11.0 and later releases, for R8 Gx and R8 Gxx functionality, apart from the above, operator-specific values 128–254 are also considered as valid.

**Group Value**

N/A

**AVP Flag**

M

## **QoS-Information**

Defines the QoS information for an IP-CAN bearer or PCC rule.

**AVP Header**

1016 10415

**Vendor ID**

10415

**VSA Type**

1016

**AVP Type**

GROUPED

**Group Value**

- [ QOS\_CLASS\_IDENTIFIER ]
- [ MAX\_REQUESTED\_BANDWIDTH\_UL ]
- [ MAX\_REQUESTED\_BANDWIDTH\_DL ]
- [ GUARANTEED\_BITRATE\_UL ]
- [ GUARANTEED\_BITRATE\_DL ]
- [ BEARER\_IDENTIFIER ]
- [ ALLOCATION\_RETENTION\_PRIORITY ]
- [ APN\_AGGREGATE\_MAX\_BITRATE\_UL ]
- [ APN\_AGGREGATE\_MAX\_BITRATE\_DL ]

**AVP Flag**

M

## **QoS-Negotiation**

Indicates QoS negotiation capability. I.e., if the PCRF is allowed to negotiate the QoS.

**AVP Header**

1029 10415

**Vendor ID**

10415

**VSA Type**

1029

**AVP Type**

ENUM. Supported values are:

NO\_QoS\_NEGOTIATION (0)

QoS\_NEGOTIATION\_SUPPORTED (1)

**Group Value**

N/A

**AVP Flag**

M

## QoS-Profile-Template

This AVP contains the list of supported Quality of Service profile templates.

**AVP Header**

6067 0

**Vendor ID**

0

**VSA Type**

6067

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## QoS-Resource-Request

Resource requested by UE to PCRF.

**AVP Header**

6106 10415

**Vendor ID**

10415

**VSA Type**

6106

**AVP Type**

GROUPED

**Group Value**

[ QOS\_RESOURCE\_IDENTIFIER ]

[ QOS\_RESOURCE\_OPERATION ]

[ TFT\_PACKET\_FILTER\_INFORMATION ]

[ QOS\_INFORMATION ]

**AVP Flag**

**■ Attributes**

M

---

## QoS-Resources

This AVP provides the description of the Quality of Service resources for policing traffic flows.

**AVP Header**

6065 0

**Vendor ID**

0

**VSA Type**

6065

**AVP Type**

GROUPED

**Group Value**

[ EXTENDED\_QOS\_FILTER\_RULE ]

**AVP Flag**

M

---

## QoS-Rule-Definition

Defines the QoS rule for a service flow sent by PCRF to the BBERF.

**AVP Header**

1053 10415

**Vendor ID**

10415

**VSA Type**

1053

**AVP Type**

GROUPED

**Group Value**

[ QOS\_RULE\_NAME ]

[ FLOW\_DESCRIPTION ]

[ QOS\_INFORMATION ]

[ PRECEDENCE ]

**AVP Flag**

M

---

## QoS-Rule-Install

Contains the QoS rules that need to be installed.

**AVP Header**

1051 10415

**Vendor ID**  
10415

**VSA Type**  
1051

**AVP Type**  
GROUPED

**Group Value**  
[ QOS\_RULE\_DEFINITION ]  
[ TUNNEL\_INFORMATION ]  
[ RESOURCE\_ALLOCATION\_NOTIFICATION ]

**AVP Flag**  
M

## QoS-Rule-Name

For QoS rules provided by the CRF it uniquely identifies a charging rule for a bearer.

**AVP Header**  
1054 10415

**Vendor ID**  
10415

**VSA Type**  
1054

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

## QoS-Rule-Remove

Used to remove QoS rules from a Gateway Control Session.

**AVP Header**  
1052 10415

**Vendor ID**  
10415

**VSA Type**  
1052

**AVP Type**  
GROUPED

**Group Value**  
[ QOS\_RULE\_NAME ]

**■ Attributes**

**AVP Flag**  
M

---

## QoS-Rule-Report

Report the status of QoS rules.

**AVP Header**  
1055 10415

**Vendor ID**  
10415

**VSA Type**  
1055

**AVP Type**  
GROUPED

**Group Value**  
[ QOS\_RULE\_NAME ]  
[ PCC\_RULE\_STATUS ]  
[ RULE\_FAILURE\_CODE ]

**AVP Flag**  
M

---

## QoS-Subscribed

This AVP indicates the quality of service subscribed for a certain service.

**AVP Header**  
1404 10415

**Vendor ID**  
10415

**VSA Type**  
1404

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

---

## QoS-Upgrade

Indicates whether SGSN supports upgrade of QoS by GGSN.

**AVP Header**  
1030 10415

**Vendor ID**

10415

**VSA Type**

1030

**AVP Type**

ENUM. Supported values are:

QoS\_UPGRADE\_NOT\_SUPPORTED (0)

QoS\_UPGRADE\_SUPPORTED (1)

**Group Value**

N/A

**AVP Flag**

M

## RACS-Contact-Point

Identifies the RACS element to which resource reservation requests should be sent.

**AVP Header**

351 0

**Vendor ID**

0

**VSA Type**

351

**AVP Type**

DIAMIDENT

**Group Value**

N/A

**AVP Flag**

M

## RAI

This AVP contains the Routing Area Identity of the SGSN where the UE is registered.

**AVP Header**

909 10415

**Vendor ID**

10415

**VSA Type**

909

**AVP Type**

UTF8STRING

**Group Value**

N/A

**■ Attributes**

**AVP Flag**  
M

---

## RAND

This AVP contains the RAND (EAP Authentication Vector).

**AVP Header**  
1447 10415

**Vendor ID**  
10415

**VSA Type**  
1447

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

---

## RAS-Id

This AVP contains the RAS identifier.

**AVP Header**  
10000 0

**Vendor ID**  
0

**VSA Type**  
10000

**AVP Type**  
UINT32

**Group Value**  
N/A

**AVP Flag**  
M

---

## Rating-Group

Identifier of a rating group for service. It contains the charging key (defined in 3GPP TS 23.125). Each quota allocated to a Diameter CC session has a unique Rating Group value as specified in RFC 4006.

**AVP Header**  
432 0

**Vendor ID**  
0

**VSA Type**

432

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## RAT-Frequency-Selection-Priority

Contains the RAT frequency selection priority.

**AVP Header**

1440 10415

**Vendor ID**

10415

**VSA Type**

1440

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## RAT-Type

This AVP contains value of the Radio Access Technology which is currently serving the UE.

**AVP Header**

1032 10415

**Vendor ID**

10415

**VSA Type**

1032

**AVP Type**

ENUM. Supported values are:

WLAN (0)

UTRAN (1000)

GERAN (1001)

GAN (1002)

HSPA\_EVOLUTION (1003)

EUTRAN (1004)

**■ Attributes**

CDMA2000\_1X (2000)

HRPD (2001)

UMB (2002)

**Group Value**

N/A

**AVP Flag**

M

## Re-Synchronization-Info

This AVP contains the concatenation of RAND and AUTS.

**AVP Header**

6014 10415

**Vendor ID**

10415

**VSA Type**

6014

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## Reason-Code

This AVP contains the reason for the network initiated de-registration.

**AVP Header**

616 10415

**Vendor ID**

10415

**VSA Type**

616

**AVP Type**

ENUM. Supported values are:

PERMANENT\_TERMINATION (0)

NEW\_SERVER\_ASSIGNED (1)

SERVER\_CHANGE (2)

REMOVE\_S-CSCF (3)

**Group Value**

N/A

**AVP Flag**  
M

---

## Reason-Info

This AVP contains textual information to inform the user about the reason for a de-registration.

**AVP Header**  
617 10415

**Vendor ID**  
10415

**VSA Type**  
617

**AVP Type**  
UTF8STRING

**Group Value**  
N/A

**AVP Flag**  
M

---

## Record-Route

This AVP contains a comma separated list of Record Route header(s).

**AVP Header**  
646 10415

**Vendor ID**  
10415

**VSA Type**  
646

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
N/A

---

## Reservation-Class

Contains an integer used as an index pointing to the traffic characteristic of the flow.

**AVP Header**  
456 13019

**Vendor ID**  
13019

## ■ Attributes

**VSA Type**

456

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

N/A

---

## Resource-Allocation-Notification

Defines whether the rules included within the Charging-Rule-Install/QoS-Rule-Install AVP need be notified.

**AVP Header**

1063 10415

**Vendor ID**

10415

**VSA Type**

1063

**AVP Type**

ENUM. Supported values are:

ENABLE\_NOTIFICATION (0)

**Group Value**

N/A

**AVP Flag**

M

---

## Re-Auth-Request-Type

Specifies the re-authorization request type and included in application-specific authorization answers to inform the client of the action expected upon expiration of the Authorization-Lifetime.

**AVP Header**

285 0

**Vendor ID**

0

**VSA Type**

285

**AVP Type**

ENUM. Supported values are:

AUTHORIZE\_ONLY (0)

AUTHORIZE\_AUTHENTICATE (1)

**Group Value**

N/A

**AVP Flag**  
M

---

## Redirect-Address-Type

Defines the address type of the address given in the Redirect-Server-Address AVP.

**AVP Header**  
433 0

**Vendor ID**  
0

**VSA Type**  
433

**AVP Type**  
ENUM. Supported values are:

- IPv4 Address (0)
- IPv6 Address (1)
- URL (2)
- SIP URL (2)

**Group Value**  
N/A

**AVP Flag**  
M

---

## Redirect-Host

The alternate routing details to which the request need to be redirected to.

**AVP Header**  
292 0

**Vendor ID**  
0

**VSA Type**  
292

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

---

## Redirect-Host-Usage

Dictates how the routing entry resulting from the Redirect-Host is to be used.

**■ Attributes****AVP Header**

261 0

**Vendor ID**

0

**VSA Type**

261

**AVP Type**

ENUM. Supported values are:

DONT\_CACHE (0)

ALL\_SESSION (1)

ALL\_REALM (2)

REALM\_AND\_APPLICATION (3)

ALL\_APPLICATION (4)

ALL\_HOST (5)

ALL\_USER (6)

**Group Value**

N/A

**AVP Flag**

M

## Redirect-Max-Cache-Time

Maximum duration in seconds the peer and route table entries, created as a result of the Redirect-Host, will be cached.

**AVP Header**

262 0

**Vendor ID**

0

**VSA Type**

262

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## Redirect-Server

This AVP contains the address information of the redirect server (for example,, HTTP redirect server, SIP Server) with which the end user is to be connected when redirected as account cannot cover the service cost.

**AVP Header**

434 0

**Vendor ID**

0

**VSA Type**

434

**AVP Type**

GROUPED

**Group Value**

[ Redirect-Address-Type ]

[ Redirect-Server-Address ]

**AVP Flag**

M

## Redirect-Server-Address

Defines the address of the redirect server.

**AVP Header**

435 0

**Vendor ID**

0

**VSA Type**

435

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

## Regional-Subscription-Zone-Code

Regional-Subscription-Zone-Code. Up to 10 zone codes are used to define the tracking areas into which the subscriber is allowed or not allowed to roam.

**AVP Header**

1446 10415

**Vendor ID**

10415

**VSA Type**

1446

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

## ■ Attributes

M

---

## Reply-Message

This AVP contains text that may be displayed to the user.

**AVP Header**

18 0

**Vendor ID**

0

**VSA Type**

18

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## Reporting-Level

Defines on what level the TPF reports the usage for the related charging rule.

**AVP Header**

1011 10415

**Vendor ID**

10415

**VSA Type**

1011

**AVP Type**

ENUM

**Group Value**

N/A

**AVP Flag**

M

---

## Requested-Action

The action requested when the CC\_Request\_Type is EVENT\_REQUEST.

**AVP Header**

436 0

**Vendor ID**

0

**VSA Type**

436

**AVP Type**

ENUM. Supported values are:

- DIRECT\_DEBITING (0)
- REFUND\_ACCOUNT (1)
- CHECK\_BALANCE (2)
- PRICE\_ENQUIRY (3)

**Group Value**

N/A

**AVP Flag**

M

## Requested-Domain

Indicates the access domain for which certain data are requested.

**AVP Header**

706 0

**Vendor ID**

0

**VSA Type**

706

**AVP Type**

ENUM

**Group Value**

N/A

**AVP Flag**

M

## Requested-EUTRAN-Authentication-Info

This AVP contains the EU Tran authentication information.

**AVP Header**

6010 10415

**Vendor ID**

10415

**VSA Type**

6010

**AVP Type**

GROUPED

**Group Value**

[ NUMBER\_OF\_REQUESTED\_VECTORS ]

[ IMMEDIATE\_RESPONSE\_PREFERRED ]

## ■ Attributes

[ RE\_SYNCHRONIZATION\_INFO ]

**AVP Flag**  
M

## Requested-GERAN-Authentication-Info

This AVP contains GE RAN authentication information.

**AVP Header**  
6012 10415

**Vendor ID**  
10415

**VSA Type**  
6012

**AVP Type**  
GROUPED

**Group Value**  
[ NUMBER\_OF\_REQUESTED\_VECTORS ]  
[ IMMEDIATE\_RESPONSE\_PREFERRED ]  
[ RE\_SYNCHRONIZATION\_INFO ]

**AVP Flag**  
M

## Requested-Information

This AVP provides the list of items requested by the AF.

**AVP Header**  
353 13019

**Vendor ID**  
13019

**VSA Type**  
353

**AVP Type**  
ENUM. Supported values are:  
NASS-USER-ID (0)  
LOCATION-INFORMATION (1)  
RACS-CONTACT-POINT (2)  
ACCESS-NETWORK-TYPE (3)  
TERMINAL-TYPE (4)  
LOGICAL-ACCESS-ID (5)  
PHYSICAL-ACCESS-ID (6)  
ACCESS-NETWORK-TYPE-RESERVED (7)

INITIAL-GATE-SETTING-RESERVED (8)  
 QOS-PROFILE-RESERVED (9)  
 IP-CONNECTIVITY-STATUS-RESERVED (10)

**Group Value**

N/A

**AVP Flag**

M

## Requested-Party-Address

In IMS it holds the address (SIP URI or TEL URI) of the party (Public User ID or Public Service ID) to whom the SIP transaction was originally posted.

**AVP Header**

1251 10415

**Vendor ID**

10415

**VSA Type**

1251

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

## Requested-QoS

It is used within the Flow-Info AVP to indicate the QoS requested by the UE for a particular IP flow in the high rate packet data radio access network.

**AVP Header**

812 5535

**Vendor ID**

5535

**VSA Type**

812

**AVP Type**

GROUPED

**Group Value**

[ QoS-Class ]

[ Min-Bandwidth-UL ]

[ Min-Bandwidth-DL ]

**AVP Flag**

M

---

## Requested-Service-Unit

Amount of requested units specified by the Diameter credit-control client.

**AVP Header**

437 0

**Vendor ID**

0

**VSA Type**

437

**AVP Type**

GROUPED

**Group Value**

- [ TARIFF\_TIME\_CHANGE ]
- [ TARIFF\_CHANGE\_USAGE ]
- [ CC\_TIME ]
- [ CC\_MONEY ]
- [ CC\_TOTAL\_OCTETS ]
- [ CC\_INPUT\_OCTETS ]
- [ CC\_OUTPUT\_OCTETS ]
- [ CC\_SERVICE\_SPECIFIC\_UNITS ]

**AVP Flag**

M

---

## Requested-UTRAN-Authentication-Info

This AVP contains the UTRAN authentication information.

**AVP Header**

6011 10415

**Vendor ID**

10415

**VSA Type**

6011

**AVP Type**

GROUPED

**Group Value**

- [ NUMBER\_OF\_REQUESTED\_VECTORS ]
- [ IMMEDIATE\_RESPONSE\_PREFERRED ]
- [ RE\_SYNCHRONIZATION\_INFO ]

**AVP Flag**

M

---

## Requested-UTRAN-GERAN-Authentication-Info

This AVP contains the information related to the authentication requests for UTRAN or GERAN.

**AVP Header**

1409 10415

**Vendor ID**

10415

**VSA Type**

1409

**AVP Type**

GROUPED

**Group Value**

- [ NUMBER\_OF\_REQUESTED\_VECTORS ]
- [ IMMEDIATE\_RESPONSE\_PREFERRED ]
- [ RE\_SYNCHRONIZATION\_INFO ]

**AVP Flag**

M

---

## Requesting-Node-Type

Requesting node type.

**AVP Header**

1455 10415

**Vendor ID**

10415

**VSA Type**

1455

**AVP Type**

ENUM. Supported values are:

- MME (0)
- SGSN (1)
- MME-SGSN (2)

**Group Value**

N/A

**AVP Flag**

M

---

## Required-MBMS-Bearer-Capabilities

Contains the minimum bearer capabilities the UE needs to support.

**AVP Header**

901 10415

**Vendor ID**

10415

**VSA Type**

901

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## Reservation-Priority

Used by the PCRF to guarantee service for an application session of a higher relative priority.

**AVP Header**

458 13019

**Vendor ID**

13019

**VSA Type**

458

**AVP Type**

ENUM. Supported values are:

DEFAULT (0)

PRIORITY-ONE (1)

PRIORITY-TWO (2)

PRIORITY-THREE (3)

PRIORITY-FOUR (4)

PRIORITY-FIVE (5)

PRIORITY-SIX (6)

PRIORITY-SEVEN (7)

**Group Value**

N/A

**AVP Flag**

N/A

---

## Restoration-Info

Contains the information related to a specific registration.

**AVP Header**

649 10415

**Vendor ID**

10415

**VSA Type**

649

**AVP Type**

GROUPED

**Group Value**

[ PATH ]

[ CONTACT ]

[ SUBSCRIPTION\_INFO ]

**AVP Flag**

N/A

---

## Restriction-Filter-Rule

Provides filter rules for a services that are to remain accessible even if there are no more service units granted.

**AVP Header**

438 0

**Vendor ID**

0

**VSA Type**

438

**AVP Type**

IPFILTERRULE

**Group Value**

N/A

**AVP Flag**

M

---

## Result-Code

Indicates whether a particular request was completed successfully or whether an error occurred.

**AVP Header**

268 0

**Vendor ID**

0

**VSA Type**

268

**AVP Type**

ENUM. Supported values are:

DIAMETER\_MULTI\_ROUND\_AUTH (1001)  
DIAMETER\_SUCCESS (2001)  
DIAMETER\_LIMITED\_SUCCESS (2002)  
DIAMETER\_COMMAND\_UNSUPPORTED (3001)  
DIAMETER\_UNABLE\_TO\_DELIVER (3002)  
DIAMETER\_REALM\_NOT\_SERVED (3003)  
DIAMETER\_TOO\_BUSY (3004)  
DIAMETER\_LOOP\_DETECTED (3005)  
DIAMETER\_REDIRECT\_INDICATION (3006)  
DIAMETER\_APPLICATION\_UNSUPPORTED (3007)  
DIAMETER\_INVALID\_HDR\_BITS (3008)  
DIAMETER\_INVALID\_AVP\_BITS (3009)  
DIAMETER\_UNKNOWN\_PEER (3010)  
DIAMETER\_AUTHENTICATION\_REJECTED (4001)  
DIAMETER\_OUT\_OF\_SPACE (4002)  
ELECTION\_LOST (4003)  
DIAMETER\_END\_USER\_SERVICE\_DENIED (4010)  
DIAMETER\_CREDIT\_CONTROL\_NOT\_APPLICABLE (4011)  
DIAMETER\_CREDIT\_LIMIT\_REACHED (4012)  
DIAMETER\_BALANCE\_IS\_ZERO (4212)  
DIAMETER\_AVP\_UNSUPPORTED (5001)  
DIAMETER\_UNKNOWN\_SESSION\_ID (5002)  
DIAMETER\_AUTHORIZATION\_REJECTED (5003)  
DIAMETER\_INVALID\_AVP\_VALUE (5004)  
DIAMETER\_MISSING\_AVP (5005)  
DIAMETER\_RESOURCES\_EXCEEDED (5006)  
DIAMETER\_CONTRADICTING\_AVPS (5007)  
DIAMETER\_AVP\_NOT\_ALLOWED (5008)  
DIAMETER\_AVP\_OCCURS\_TOO\_MANY\_TIMES (5009)  
DIAMETER\_NO\_COMMON\_APPLICATION (5010)  
DIAMETER\_UNSUPPORTED\_VERSION (5011)  
DIAMETER\_UNABLE\_TO\_COMPLY (5012)  
DIAMETER\_INVALID\_BIT\_IN\_HEADER (5013)  
DIAMETER\_INVALID\_AVP\_LENGTH (5014)

DIAMETER\_INVALID\_MESSAGE\_LENGTH (5015)  
 DIAMETER\_INVALID\_AVP\_BIT\_COMBO (5016)  
 DIAMETER\_NO\_COMMON\_SECURITY (5017)  
 DIAMETER\_USER\_UNKNOWN (5030)  
 DIAMETER\_RATING\_FAILED (5031)

**Group Value**

N/A

**AVP Flag**

M

## Revalidation-Time

This AVP contains the value indicating the NTP time before which the PCEF will have to re-request PCC rules.

**AVP Header**

1042 10415

**Vendor ID**

10415

**VSA Type**

1042

**AVP Type**

TIME

**Group Value**

N/A

**AVP Flag**

M

## Roaming-Restricted-Due-To-Unsupported-Feature

This AVP indicates that roaming is restricted due to unsupported feature.

**AVP Header**

1457 10415

**Vendor ID**

10415

**VSA Type**

1457

**AVP Type**

ENUM. Supported values are:

ROAMING\_RESTRICTED\_DUE\_TO\_UNSUPPORTED\_FEATURE (0)

**Group Value**

N/A

**AVP Flag**

M

## Role-Of-Node

This AVP specifies the role of the AS/CSCF.

The identifier can be one of the following:

- ORIGINATING\_ROLE (0): The AS/CSCF is applying a originating role, serving the calling subscriber.
- TERMINATING\_ROLE (1): The AS/CSCF is applying a terminating role, serving the called subscriber.
- PROXY ROLE (2): The AS is applying a proxy role.
- B2BUA\_ROLE (3): The AS is applying a B2BUA role.

**AVP Header**

829 10415

**Vendor ID**

10415

**VSA Type**

829

**AVP Type**

ENUM

**Group Value**

N/A

**AVP Flag**

M

## Route-Record

The value added to this AVP same as the one received in the Origin-Host of the Capabilities Exchange message.

**AVP Header**

282 0

**Vendor ID**

0

**VSA Type**

282

**AVP Type**

DIAMIDENT

**Group Value**

N/A

**AVP Flag**

M

## Routing-Policy

This attribute is used to describe a single IP flow.

**AVP Header**

312 10415

<b>Vendor ID</b>	10415
<b>VSA Type</b>	312
<b>AVP Type</b>	IPFILTERRULE
<b>Group Value</b>	N/A
<b>AVP Flag</b>	M

---

## RR-Bandwidth

Indicates the maximum required bandwidth in bits per second for RTCP receiver reports within the session component.

<b>AVP Header</b>	521 10415
<b>Vendor ID</b>	10415
<b>VSA Type</b>	521
<b>AVP Type</b>	UINT32
<b>Group Value</b>	N/A
<b>AVP Flag</b>	M

---

## RS-Bandwidth

Indicates the maximum required bandwidth in bits per second for RTCP sender reports within the session component.

<b>AVP Header</b>	522 10415
<b>Vendor ID</b>	10415
<b>VSA Type</b>	522
<b>AVP Type</b>	UINT32
<b>Group Value</b>	N/A
<b>AVP Flag</b>	M

---

## Rule-Activation-Time

Contains the value indicating the NTP time at which the PCC rule has to be enforced.

**AVP Header**

1043 10415

**Vendor ID**

10415

**VSA Type**

1043

**AVP Type**

TIME

**Group Value**

N/A

**AVP Flag**

M

---

## Rule-Deactivation-Time

Contains the value indicating the NTP time at which the PCEF has to stop enforcing the PCC rule.

**AVP Header**

1044 10415

**Vendor ID**

10415

**VSA Type**

1044

**AVP Type**

TIME

**Group Value**

N/A

**AVP Flag**

M

---

## Rule-Failure-Code

Contains the rule failure code.

**AVP Header**

1031 10415

**Vendor ID**

10415

**VSA Type**

1031

**AVP Type**

ENUM. Supported values are:

UNKNOWN\_RULE\_NAME (1)  
 RATING\_GROUP\_ERROR (2)  
 SERVICE\_IDENTIFIER\_ERROR (3)  
 GW\_PCEF\_MALFUNCTION (4)  
 RESOURCES\_LIMITATION (5)  
 MAX\_NR\_BEARERS\_REACHED (6)  
 UNKNOWN\_BEARER\_ID (7)  
 MISSING\_BEARER\_ID (8)  
 MISSING\_FLOW\_DESCRIPTION (9)  
 RESOURCE\_ALLOCATION\_FAILURE (10)  
 UNSUCCESSFUL\_QOS\_VALIDATION (11)

**Group Value**

N/A

**AVP Flag**

M

---

## Rule-Reason-Code

Contains the rule reason code.

**AVP Header**

814 10415

**Vendor ID**

10415

**VSA Type**

814

**AVP Type**

ENUM. Supported values are:

UNKNOWN\_FLOW\_IDENTIFIER (0)  
 UNKNOWN\_RULE\_NAME (1)  
 RATING\_GROUP\_ERROR (2)  
 SERVICE\_IDENTIFIER\_ERROR (3)  
 AGW\_MALFUNCTION (4)  
 RESOURCES\_LIMITATION (5)

**Group Value**

N/A

**AVP Flag**

M

---

## SCSCF-Restoration-Info

Contains the information required for an S-CSCF to handle the requests for a user.

**AVP Header**

639 10415

**Vendor ID**

10415

**VSA Type**

639

**AVP Type**

GROUPED

**Group Value**

[ USER\_NAME ]

[ RESTORATION\_INFO ]

[ SIP\_AUTHENTICATION\_SCHEME ]

**AVP Flag**

N/A

---

## SDP-Answer-Timestamp

This AVP specifies the time in UTC format of the response to the SDP offer.

**AVP Header**

1275 0

**Vendor ID**

0

**VSA Type**

1275

**AVP Type**

TIME

**Group Value**

N/A

**AVP Flag**

M

---

## SDP-Media-Component

Contains the interface representing the SDP-Media-Component grouped AVP type.

**AVP Header**

843 10415

**Vendor ID**

10415

**VSA Type**

843

**AVP Type**

GROUPED

**Group Value**

- [ SDP\_MEDIA\_NAME ]
- [ SDP\_MEDIA\_DESCRIPTION ]
- [ MEDIA\_INITIATOR\_FLAG ]
- [ AUTHORISED\_QOS ]
- [ 3GPP\_CHARGING\_ID ]

**AVP Flag**

M

## SDP-Media-Description

Contains the content of an attribute-line" (i=, c=, b=, k=, a=) related to a media component. The attributes are specifying the media described in the SDP-Media-Name AVP.

**AVP Header**

845 10415

**Vendor ID**

10415

**VSA Type**

845

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

## SDP-Media-Name

This AVP holds the content of a "m=" line in the SDP data.

**AVP Header**

844 10415

**Vendor ID**

10415

**VSA Type**

844

**AVP Type**

UTF8STRING

**Group Value**

N/A

**■ Attributes**

**AVP Flag**  
M

---

## SDP-Offer-Timestamp

This AVP specifies the time in UTC format of the SDP offer.

**AVP Header**  
1274 0

**Vendor ID**  
0

**VSA Type**  
1274

**AVP Type**  
TIME

**Group Value**  
N/A

**AVP Flag**  
M

---

## SDP-Session-Description

This AVP holds the content of an "attribute-line" (i=, c=, b=, k=, a=) related to a session.

**AVP Header**  
842 10415

**Vendor ID**  
10415

**VSA Type**  
842

**AVP Type**  
UTF8STRING

**Group Value**  
N/A

**AVP Flag**  
M

---

## SDP-TimeStamps

This AVP specifies the time of the SDP offer and the SDP answer.

**AVP Header**  
1273 0

**Vendor ID**  
0

**VSA Type**

1273

**AVP Type**

GROUPED

**Group Value**

[ SDP\_OFFER\_TIMESTAMP ]

[ SDP\_ANSWER\_TIMESTAMP ]

**AVP Flag**

M

## SDP-Type

This AVP provides information on whether the SDP media component is of type SDP offer or SDP answer.

**AVP Header**

2036 10415

**Vendor ID**

10415

**VSA Type**

2036

**AVP Type**

ENUM. Supported values are:

SDP\_OFFER (0)

SDP\_ANSWER (1)

**Group Value**

N/A

**AVP Flag**

M

## Secondary-Charging-Collection-Function-Name

Defines the address of the secondary offline charging system for the bearer.

**AVP Header**

622 10415

**Vendor ID**

10415

**VSA Type**

622

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## Secondary-Event-Charging-Function-Name

Defines the address of the secondary online charging system for the bearer.

**AVP Header**

620 10415

**Vendor ID**

10415

**VSA Type**

620

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## Sector-Id

The identifier of sector that MS exists.

**AVP Header**

10002 0

**Vendor ID**

0

**VSA Type**

10002

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## Security-Parameter-Index

This AVP contains the security parameter index of the IPSec packet.

**AVP Header**

1056 10415

**Vendor ID**

10415

**VSA Type**

1056

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

## Send-Data-Indication

This AVP indicates that sender requests user data in SNR.

**AVP Header**  
710 0

**Vendor ID**  
0

**VSA Type**  
710

**AVP Type**  
ENUM

**Group Value**  
N/A

**AVP Flag**  
M

## Served-Party-IP-Address

This AVP holds the IP address of either the calling or called party, depending on whether the P-CSCF is in touch with the calling or the called party. This AVP is only provided by the P-CSCF and S-CSCF.

**AVP Header**  
848 10415

**Vendor ID**  
10415

**VSA Type**  
848

**AVP Type**  
ADDRESS

**Group Value**  
N/A

**AVP Flag**  
M

## Server-Assignment-Type

This AVP contains the type of server update being performed in a Server-Assignment-Request operation.

**AVP Header**

614 10415

**Vendor ID**

10415

**VSA Type**

614

**AVP Type**

ENUM. Supported values are:

- NO\_ASSIGNMENT (0)
- REGISTRATION (1)
- RE\_REGISTRATION (2)
- UNREGISTERED\_USER (3)
- TIMEOUT\_DEREGISTRATION (4)
- USER\_DEREGISTRATION (5)
- TIMEOUT\_DEREGISTRATION\_STORE\_SERVER\_NAME (6)
- USER\_DEREGISTRATION\_STORE\_SERVER\_NAME (7)
- ADMINISTRATIVE\_DEREGISTRATION (8)
- AUTHENTICATION\_FAILURE (9)
- AUTHENTICATION\_TIMEOUT (10)
- DEREGISTRATION\_TOO MUCH DATA (11)

**Group Value**

N/A

**AVP Flag**

M

## Server-Capabilities

This grouped AVP contains information/capabilities of an S-CSCF server.

**AVP Header**

603 10415

**Vendor ID**

10415

**VSA Type**

603

**AVP Type**

GROUPED

**Group Value**

[ MANDATORY\_CAPABILITY ]

[ OPTIONAL\_CAPABILITY ]  
 [ SERVER\_NAME ]

**AVP Flag**

M

---

## Server-Name

This AVP contains a SIP-URL used to identify a SIP server.

**AVP Header**

602 10415

**Vendor ID**

10415

**VSA Type**

602

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## Service-Class

Contains the service class requested by the AF.

**AVP Header**

459 13019

**Vendor ID**

13019

**VSA Type**

459

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

N/A

---

## Service-Context-Id

Unique identifier of credit-control service.

**AVP Header**

461 0

## ■ Attributes

**Vendor ID**  
0

**VSA Type**  
461

**AVP Type**  
UTF8STRING

**Group Value**  
N/A

**AVP Flag**  
M

---

## Service-Data-Container

Service data container.

**AVP Header**  
2040 10415

**Vendor ID**  
10415

**VSA Type**  
2040

**AVP Type**  
GROUPED

**Group Value**

- [ AF\_CORRELATION\_INFORMATION ]
- [ CHARGING\_RULE\_BASE\_NAME ]
- [ ACCOUNTING\_INPUT\_OCTETS ]
- [ ACCOUNTING\_OUTPUT\_OCTETS ]
- [ ACCOUNTING\_INPUT\_PACKETS ]
- [ ACCOUNTING\_OUTPUT\_PACKETS ]
- [ LOCAL\_SEQUENCE\_NUMBER ]
- [ QOS\_INFORMATION ]
- [ RATING\_GROUP ]
- [ CHANGE\_TIME ]
- [ SERVICE\_IDENTIFIER ]
- [ SERVICE\_SPECIFIC\_INFO ]
- [ SGSN\_ADDRESS ]
- [ TIME\_FIRST\_USAGE ]
- [ TIME\_LAST\_USAGE ]
- [ TIME\_USAGE ]
- [ CHANGE\_CONDITION ]

[ 3GPP\_USER\_LOCATION\_INFO ]  
 [ FLOW\_DESCRIPTION ]  
 [ CHARGING\_RULE\_NAME ]  
 [ FIRST\_PACKET\_DIRECTION ]  
 [ 3GPP2\_BSID ]

**AVP Flag**

M

---

## Service-Identifier

Specifies the identity of the service or service component the service data flow in a charging rule relates to.

**AVP Header**

439 0

**Vendor ID**

0

**VSA Type**

439

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## Service-Indication

This AVP contains the Service Indication that identifies a service in AS.

**AVP Header**

704 0

**Vendor ID**

0

**VSA Type**

704

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## Service-Information

The purpose of this AVP is to allow the transmission of additional 3GPP service-specific information elements.

**AVP Header**

873 10415

**Vendor ID**

10415

**VSA Type**

873

**AVP Type**

GROUPED

**Group Value**

[IMS-Information]

**AVP Flag**

M

---

## Service-Info-Status

Indicates the status of the service information that the AF is providing to the PCRF.

**AVP Header**

527 10415

**Vendor ID**

10415

**VSA Type**

527

**AVP Type**

ENUM. Supported values are:

FINAL\_SERVICE\_INFORMATION (0)

PRELIMINARY\_SERVICE\_INFORMATION (1)

**Group Value**

N/A

**AVP Flag**

M

---

## Service-Parameter-Info

Service-specific information used for rating.

**AVP Header**

440 0

**Vendor ID**

0

**VSA Type**

440

**AVP Type**

GROUPED

**Group Value**

[ Service-Parameter-Type ]

[ Service-Parameter-Value ]

**AVP Flag**

M

---

## Service-Parameter-Type

Service event specific parameter (for example, end-user location or service name).

**AVP Header**

441 0

**Vendor ID**

0

**VSA Type**

441

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## Service-Parameter-Value

Value of the service parameter type.

**AVP Header**

442 0

**Vendor ID**

0

**VSA Type**

442

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## Service-Selection

Service-Selection.

**AVP Header**

493 0

**Vendor ID**

0

**VSA Type**

493

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## Service-Specific-Data

This AVP holds service specific data if and as provided by an Application Server.

**AVP Header**

1249 0

**Vendor ID**

0

**VSA Type**

1249

**AVP Type**

GROUPED

**Group Value**

[ SERVICE\_SPECIFIC\_TYPE ]

[ SERVICE\_SPECIFIC\_VALUE ]

**AVP Flag**

M

---

## Service-Specific-Info

Service specific information.

**AVP Header**

1249 10415

**Vendor ID**

10415

**VSA Type**

1249

**AVP Type**  
GROUPED

**Group Value**  
[ SERVICE\_SPECIFIC\_DATA ]  
[ SERVICE\_SPECIFIC\_TYPE ]

**AVP Flag**  
M

## Service-Specific-Type

This AVP holds the type of the Service-Specific-Data.

**AVP Header**  
1248 0

**Vendor ID**  
0

**VSA Type**  
1248

**AVP Type**  
UINT32

**Group Value**  
N/A

**AVP Flag**  
M

## Service-Specific-Value

This AVP holds service specific value.

**AVP Header**  
863 0

**Vendor ID**  
0

**VSA Type**  
863

**AVP Type**  
UTF8STRING

**Group Value**  
N/A

**AVP Flag**  
M

## Service-Type

This AVP contains the type of service the user has requested or the type of service to be provided.

### AVP Header

6 0

### Vendor ID

0

### VSA Type

6

### AVP Type

ENUM. Supported values are:

- Login (1)
- Framed (2)
- Callback-Login (3)
- Callback-Framed (4)
- Outbound (5)
- Administrative (6)
- NAS-Prompt (7)
- Authenticate-Only (8)
- Callback-NAS-Prompt (9)
- Call-Check (10)
- Callback-Administrative (11)
- Voice (12)
- Fax (13)
- Modem-Relay (14)
- IAPP-Register\_IEEE-802\_11f (15)
- IAPP-AP-Check\_IEEE-802\_11f (16)
- Authorize-Only-RADDynAuth (17)

### Group Value

N/A

### AVP Flag

M

## ServiceTypeIdentity

This AVP contains the LCS service type identity.

### AVP Header

1484 10415

### Vendor ID

10415

**VSA Type**

1484

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## Service-URN

This AVP indicates that an AF session is used for emergency traffic. It contains values of the service URN including sub-services, as registered at IANA.

**AVP Header**

525 10415

**Vendor ID**

10415

**VSA Type**

525

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## Serving-Node-Type

This AVP identifies the Serving Node type.

**AVP Header**

2047 10415

**Vendor ID**

10415

**VSA Type**

2047

**AVP Type**

ENUM. Supported values are:

SGSN (0)

PMIPSGW (1)

GTPSGW (2)

ePDG (3)

hSGW (4)

**■ Attributes**

MME (5)

**Group Value**  
N/A**AVP Flag**  
M

## Session-Bundle-Id

Used to identify the group of sessions to which session of the AA-Answer belongs.

**AVP Header**  
400 13019**Vendor ID**  
13019**VSA Type**  
400**AVP Type**  
UINT32**Group Value**  
N/A**AVP Flag**  
M

## Session-Id

Specifies the specific session with an identifier.

**AVP Header**  
263 0**Vendor ID**  
0**VSA Type**  
263**AVP Type**  
UTF8STRING**Group Value**  
N/A**AVP Flag**  
M

## Session-Linking-Indicator

Indicates whether the session linking between the Gateway Control Session and the Gx session must be deferred.

**AVP Header**

1064 10415

**Vendor ID**

10415

**VSA Type**

1064

**AVP Type**

ENUM. Supported values are:

SESSION\_LINKING\_IMMEDIATE (0)

SESSION\_LINKING\_DEFERRED (1)

**Group Value**

N/A

**AVP Flag**

M

---

## Session-Priority

Indicates to the HSS or accounting server the session's priority. PRIORITY-0 is the highest priority.

**AVP Header**

650 10415

**Vendor ID**

10415

**VSA Type**

650

**AVP Type**

ENUM. Supported values are:

PRIORITY-0 (0)

PRIORITY-0 (1)

PRIORITY-0 (2)

PRIORITY-0 (3)

PRIORITY-0 (4)

**Group Value**

N/A

**AVP Flag**

N/A

---

## Session-Release-Cause

Determines the release cause of the IP-CAN session.

**AVP Header**

1045 10415

**Vendor ID**

**■ Attributes**

10415

**VSA Type**

1045

**AVP Type**

ENUM. Supported values are:

UNSPECIFIED\_REASON (0)

UE\_SUBSCRIPTION\_REASON (1)

INSUFFICIENT\_SERVER\_RESOURCES (2)

**Group Value**

N/A

**AVP Flag**

M

## Session-Request-Type

This AVP indicates the action that the PDG is asking to the 3GPP AAA server to perform.

**AVP Header**

311 10415

**Vendor ID**

10415

**VSA Type**

311

**AVP Type**

ENUM

**Group Value**

N/A

**AVP Flag**

M

## Session-Start-Indicator

This AVP contains the SFR Session Start Indication. Flags Primary PDP Context. Value is always 0xFF".

**AVP Header**

522 8164

**Vendor ID**

8164

**VSA Type**

522

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**  
M

---

## Session-Timeout

This AVP contains the maximum number of seconds of service to be provided to the user before termination of the session.

**AVP Header**  
27 0

**Vendor ID**  
0

**VSA Type**  
27

**AVP Type**  
UINT32

**Group Value**  
N/A

**AVP Flag**  
M

---

## SGSN-Address

This AVP contains the IP address of the SGSN that was used during a report.

**AVP Header**  
1228 10415

**Vendor ID**  
10415

**VSA Type**  
1228

**AVP Type**  
ADDRESS

**Group Value**  
N/A

**AVP Flag**  
M

---

## SGSN-Number

This AVP contains the ISDN number of the SGSN.

**AVP Header**  
1489 10415

**Vendor ID**  
10415

## ■ Attributes

**VSA Type**

1489

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## SGW-Address

This AVP contains the IP address of the Serving GW.

**AVP Header**

1403 10415

**Vendor ID**

10415

**VSA Type**

1403

**AVP Type**

ADDRESS

**Group Value**

N/A

**AVP Flag**

M

## SGW-Change

This AVP indicates that this is the first Accounting Request (ACR) due to S-GW change.

**AVP Header**

2065 10415

**Vendor ID**

10415

**VSA Type**

2065

**AVP Type**

ENUM. Supported values are:

ACR\_START\_NOT\_DUE\_TO\_SGW\_CHANGE (0)

ACR\_START\_DUE\_TO\_SGW\_CHANGE (1)

**Group Value**

N/A

**AVP Flag**

M

---

## SGW-Type

This AVP specifies the type of SGW of current flow.

**AVP Header**

7001 10415

**Vendor ID**

10415

**VSA Type**

7001

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## SIP-Auth-Data-Item

This AVP contains the authentication and/or authorization information for the Diameter client.

**AVP Header**

612 10415

**Vendor ID**

10415

**VSA Type**

612

**AVP Type**

GROUPED

**Group Value**

- [ SIP\_ITEM\_NUMBER ]
- [ SIP\_AUTHENTICATION\_SCHEME ]
- [ SIP\_AUTHENTICATE ]
- [ SIP\_DIGEST\_AUTHENTICATE ]
- [ SIP\_AUTHORIZATION ]
- [ SIP\_AUTHENTICATION\_CONTEXT ]
- [ CONFIDENTIALITY\_KEY ]
- [ INTEGRITY\_KEY ]
- [ LINE\_IDENTIFIER ]

**AVP Flag**

M

---

## SIP-Authenticate

This AVP contains specific parts of the data portion of the WWW-Authenticate or Proxy-Authenticate SIP headers that are to be present in a SIP response.

**AVP Header**

609 10415

**Vendor ID**

10415

**VSA Type**

609

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## SIP-Authentication-Context

This AVP contains authentication-related information relevant for performing the authentication but that is not part of the SIP authentication headers.

**AVP Header**

611 10415

**Vendor ID**

10415

**VSA Type**

611

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## SIP-Authentication-Scheme

This AVP contains the authentication scheme used in the authentication of SIP messages.

**AVP Header**

608 10415

**Vendor ID**

10415

**VSA Type**

608

**AVP Type**  
UTF8STRING

**Group Value**  
N/A

**AVP Flag**  
M

## SIP-Authorization

This AVP contains specific parts of the data portion of the Authorization or Proxy-Authorization SIP headers suitable for inclusion in a SIP request.

**AVP Header**  
610 10415

**Vendor ID**  
10415

**VSA Type**  
610

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

## SIP-Digest-Authenticate

Contains a reconstruction of either the SIP WWW-Authenticate or Proxy-Authentication header fields specified in IETF RFC 2617.

**AVP Header**  
635 10415

**Vendor ID**  
10415

**VSA Type**  
635

**AVP Type**  
GROUPED

**Group Value**  
[ DIGEST\_REALM ]  
[ DIGEST\_DOMAIN ]  
[ DIGEST\_ALGORITHM ]  
[ DIGEST\_QOP ]  
[ DIGEST\_HA1 ]

**■ Attributes**

[ DIGEST\_AUTH\_PARAM ]

**AVP Flag**  
M

---

## SIP-Forking-Indication

Describes if several SIP dialogues are related to one Diameter session.

**AVP Header**  
523 10415

**Vendor ID**  
10415

**VSA Type**  
523

**AVP Type**  
ENUM

**Group Value**  
N/A

**AVP Flag**  
M

---

## SIP-Item-Number

This AVP contains the order number of the SIP-Auth-Data-Item AVP.

**AVP Header**  
613 10415

**Vendor ID**  
10415

**VSA Type**  
613

**AVP Type**  
UINT32

**Group Value**  
N/A

**AVP Flag**  
M

---

## SIP-Message

This AVP hold the entire SIP message or messages received by the IAP.

**AVP Header**  
229 4491

**Vendor ID**

4491	
<b>VSA Type</b>	
229	
<b>AVP Type</b>	OCTETSTRING
<b>Group Value</b>	N/A
<b>AVP Flag</b>	M

---

## SIP-Method

This AVP holds the name of the SIP Method (INVITE, UPDATE, etc.) causing an accounting request to be sent to the AAA.

<b>AVP Header</b>	
824 10415	
<b>Vendor ID</b>	
10415	
<b>VSA Type</b>	
824	
<b>AVP Type</b>	UTF8STRING
<b>Group Value</b>	N/A
<b>AVP Flag</b>	M

---

## SIP-Number-Auth-Items

This AVP contains the number of authentication vectors asked/provided.

<b>AVP Header</b>	
607 10415	
<b>Vendor ID</b>	
10415	
<b>VSA Type</b>	
607	
<b>AVP Type</b>	UINT32
<b>Group Value</b>	N/A
<b>AVP Flag</b>	M

---

## SIP-Request-Timestamp

This AVP holds the time in UTC format of the initial SIP request (for example, Invite).

**AVP Header**

834 10415

**Vendor ID**

10415

**VSA Type**

834

**AVP Type**

TIME

**Group Value**

N/A

**AVP Flag**

M

---

## SIP-Response-Timestamp

This AVP holds the time in UTC format of the response to the initial SIP request (for example, 200 OK).

**AVP Header**

835 10415

**Vendor ID**

10415

**VSA Type**

835

**AVP Type**

TIME

**Group Value**

N/A

**AVP Flag**

M

---

## SN-Absolute-Validity-Time

This AVP contains the validity time of the granted service units.

**AVP Header**

505 8164

**Vendor ID**

8164

**VSA Type**

505

**AVP Type**

TIME

**Group Value**

N/A

**AVP Flag**

N/A

## SN-Bandwidth-Control

Contains the value to control bandwidth usage.

**AVP Header**

512 8164

**Vendor ID**

8164

**VSA Type**

512

**AVP Type**

ENUM. Supported values are:

HIGH (0)

LOW (1)

**Group Value**

N/A

**AVP Flag**

M

## SN-Charging-Id

This AVP contains the charging identifier.

**AVP Header**

525 8164

**Vendor ID**

8164

**VSA Type**

525

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

N/A

## SN-Fast-Reauth-Username

This AVP is used for fast reauthentication of subscriber.

## ■ Attributes

**AVP Header**  
11010 8164

**Vendor ID**  
8164

**VSA Type**  
11010

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

## SN-Firewall-Policy

This AVP contains the name of the Firewall policy to be enabled.

**AVP Header**  
515 8164

**Vendor ID**  
8164

**VSA Type**  
515

**AVP Type**  
UTF8STRING

**Group Value**  
N/A

**AVP Flag**  
N/A

## SN-Monitoring-Key

It is an identifier to a usage monitoring control instance.

**AVP Header**  
518 8164

**Vendor ID**  
8164

**VSA Type**  
518

**AVP Type**  
UINT32

**Group Value**  
N/A

**AVP Flag**

N/A

---

## SN-Phase0-PSAPName

This attribute contains name of the County to be used for a subscriber.

**AVP Header**

523 8164

**Vendor ID**

523

**VSA Type**

8164

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

N/A

---

## SN-Pseudonym-Username

This AVP is used for reauthentication of subscriber.

**AVP Header**

11011 8164

**Vendor ID**

8164

**VSA Type**

11011

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## SN-Service-Flow-Detection

This AVP defines whether the PCEF should notify the PCRF when it detects traffic matching rules included within Charging-Rule-Install AVP.

**AVP Header**

520 8164

**Vendor ID**

8164

**■ Attributes****VSA Type**

520

**AVP Type**

ENUM. Supported values are:

ENABLE\_DETECTION (0)

**Group Value**

N/A

**AVP Flag**

N/A

---

## SN-Time-Quota-Threshold

This AVP contains a quota threshold for time in percent value. This is vendor specific AVP.

**AVP Header**

503 8164

**Vendor ID**

8164

**VSA Type**

503

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## SN-Total-Used-Service-Unit

This is a vendor-specific AVP. This AVP contains the total consumed service units.

**AVP Header**

504 8164

**Vendor ID**

8164

**VSA Type**

504

**AVP Type**

GROUPED

**Group Value**

[ TARIFF\_CHANGE\_USAGE ]

[ CC\_TIME ]

[ CC\_TOTAL\_OCTETS ]

[ CC\_INPUT\_OCTETS ]

[ CC\_OUTPUT\_OCTETS ]  
 [ CC\_SERVICE\_SPECIFIC\_UNITS ]  
 [ 3GPP\_REPORTING\_REASON ]

**AVP Flag**

N/A

---

## SN-Traffic-Policy

This AVP contains the Traffic Policing policy name.

**AVP Header**

514 8164

**Vendor ID**

8164

**VSA Type**

514

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

N/A

---

## SN-Transparent-Data

This is a vendor-specific AVP. This AVP contains current PDP session information. This AVP provides information obtained from the RADIUS server during Access-Accept that can be put into vendor-specific extension towards the CGF and Prepaid server for billing purposes. This AVP is optional in the Access-Accept message.

**AVP Header**

513 8164

**Vendor ID**

8164

**VSA Type**

513

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

N/A

## SN-Unit-Quota-Threshold

This is a vendor-specific AVP. Contains quota threshold for service specific units of quota in the CLCI-C in percent value.

**AVP Header**

502 8164

**Vendor ID**

8164

**VSA Type**

502

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## SN-Usage-Monitoring

This attribute is used by PCRF to indicate if usage-monitoring and reporting is enabled or disabled.

**AVP Header**

521 8164

**Vendor ID**

8164

**VSA Type**

521

**AVP Type**

ENUM. Supported values are:

USAGE\_MONITORING\_DISABLED (0)

USAGE\_MONITORING\_ENABLED (1)

**Group Value**

N/A

**AVP Flag**

N/A

## SN-Usage-Monitoring-Control

This attribute is used for provisioning and reporting of usage information.

**AVP Header**

517 8164

**Vendor ID**

8164

**VSA Type**

517

**AVP Type**

GROUPED

**Group Value**

- [ SN\_MONITORING\_KEY ]
- [ SN\_USAGE\_MONITORING ]
- [ SN\_USAGE\_VOLUME ]

**AVP Flag**

N/A

---

## SN-Usage-Volume

This AVP indicates total uplink and downlink usage volume in octets.

**AVP Header**

519 8164

**Vendor ID**

8164

**VSA Type**

519

**AVP Type**

UINT64

**Group Value**

N/A

**AVP Flag**

N/A

---

## SN-Volume-Quota-Threshold

This AVP contains a volume threshold value in percentage value.

**AVP Header**

501 8164

**Vendor ID**

8164

**VSA Type**

501

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## Software-Version

This AVP contains the Software Version of the International Mobile Equipment Identity.

**AVP Header**

6004 10415

**Vendor ID**

10415

**VSA Type**

6004

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

## Specific-Action

Within an E-PDF initiated Re-Authorization Request; the Specific-Action AVP determines the type of the action.

**AVP Header**

513 10415

**Vendor ID**

10415

**VSA Type**

513

**AVP Type**

ENUM. Supported values are:

SERVICE\_INFORMATION\_REQUEST (0)

CHARGING\_CORRELATION\_EXCHANGE (1)

INDICATION\_OF\_LOSS\_OF\_BEARER (2)

INDICATION\_OF\_RECOVERY\_OF\_BEARER (3)

INDICATION\_OF\_RELEASE\_OF\_BEARER (4)

INDICATION\_OF\_ESTABLISHMENT\_OF\_BEARER (5)

IP\_CAN\_CHANGE (6)

INDICATION\_OF\_SUBSCRIBER\_DETACHMENT (6)

INDICATION\_OF\_RESERVATION\_EXPIRATION (7)

**Group Value**

N/A

**AVP Flag**

M

---

## Specific-APN-Info

This AVP contains the APN which is not present in the subscription context but the UE is authorized to connect to and the identity of the registered PDN-GW.

**AVP Header**

1472 10415

**Vendor ID**

10415

**VSA Type**

1472

**AVP Type**

GROUPED

**Group Value**

[ SERVICE\_SELECTION ]

[ MIP6\_AGENT\_INFO ]

**AVP Flag**

M

---

## SRES

This AVP contains the SRES.

**AVP Header**

1454 10415

**Vendor ID**

10415

**VSA Type**

1454

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## SS-Code

This AVP contains the supplementary service codes that are to be deleted from the subscription.

**AVP Header**

1476 10415

**Vendor ID**

10415

**VSA Type**

1476

## ■ Attributes

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

---

## SS-Status

This AVP refers to the state information of individual supplementary services as defined in 3GPP TS 23.011.

**AVP Header**  
1477 10415

**Vendor ID**  
10415

**VSA Type**  
1477

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

---

## Starent-Subscriber-Permission

This AVP is used to control the Network Mobility (NEMO) permission on a per Enterprise/PDN connection basis.

**AVP Header**  
20 8164

**Vendor ID**  
8164

**VSA Type**  
20

**AVP Type**  
ENUM. Supported values are:

None (0)

Simple-IP (1)

Mobile-IP (2)

Simple-IP-Mobile-IP (3)

HA-Mobile-IP (4)

Simple-IP-HA-Mobile-IP (5)

Mobile-IP-HA-Mobile-IP (6)

SIP-MIP-HA-MIP (7)  
 GGSN-PDP-TYPE-IP (8)  
 GGSN-PDP-TYPE-PPP (16)  
 Network-Mobility (32)  
 FA-HA-NEMO (38)  
 All (63)

**Group Value**

N/A

**AVP Flag**

M

## Start-Time

Contains a time-stamp (in UTC format) which represents the start of a service flow at the BM.

**AVP Header**

2041 10415

**Vendor ID**

10415

**VSA Type**

2041

**AVP Type**

TIME

**Group Value**

N/A

**AVP Flag**

M

## State

Sent by Diameter server to the NAS in an AA Response command that contains either a Result-Code of “DIAMETER\_MULTI\_ROUND\_AUTH” or a “Termination-Action” AVP with the value of “AA-REQUEST”.

**AVP Header**

24 0

**Vendor ID**

0

**VSA Type**

24

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

## ■ Attributes

M

---

## STN-SR

This AVP contains the session transfer number for SRVCC.

**AVP Header**

1433 10415

**Vendor ID**

10415

**VSA Type**

1433

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## Stop-Time

Contains a time-stamp (in UTC format) which represents the termination of a service flow at the BM. This AVP is only included in an accounting request with Accounting-Record-Type indicating STOP\_RECORD.

**AVP Header**

2042 10415

**Vendor ID**

10415

**VSA Type**

2042

**AVP Type**

TIME

**Group Value**

N/A

**AVP Flag**

M

---

## Subscriber-Priority

Subscriber-Priority.

**AVP Header**

6078 5535

**Vendor ID**

5535

**VSA Type**

6078

**AVP Type**

GROUPED

**Group Value**

- [ 3GPP2\_MAX\_AUTH\_AGGR\_BW\_BET ]
- [ 3GPP2\_MAX\_PER\_FLOW\_PRIORITY\_USER ]
- [ 3GPP2\_INTER\_USER\_PRIORITY ]
- [ 3GPP2\_ALLOWED\_PERSISTENT\_TFTS ]
- [ 3GPP2\_MAX\_SVC\_INST\_LINK\_FLOW\_TOTAL ]
- [ 3GPP2\_SERVICE\_OPTION\_PROFILE ]

**AVP Flag**

M

## Subscriber-Status

Indicates if the service is barred or granted.

**AVP Header**

1424 10415

**Vendor ID**

10415

**VSA Type**

1424

**AVP Type**

ENUM. Supported values are:

SERVICEGRANTED (0)

OPERATORDETERMINEDBARRING (1)

**Group Value**

N/A

**AVP Flag**

M

## Subscription-Data

This AVP contains the information related to the user profile relevant for EPS and GERAN/UTRAN.

**AVP Header**

6001 10415

**Vendor ID**

10415

**VSA Type**

6001

**■ Attributes****AVP Type**

GROUPED

**Group Value**

- [ SUBSCRIBER\_STATUS ]
- [ MSISDN ]
- [ STN\_SR ]
- [ NETWORK\_ACCESS\_MODE ]
- [ OPERATOR\_DETERMINED\_BARRING ]
- [ HPLMN\_ODB ]
- [ REGIONAL\_SUBSCRIPTION\_ZONE\_CODE ]
- [ ACCESS\_RESTRICTION\_DATA ]
- [ APN\_OI\_REPLACEMENT ]
- [ 3GPP\_CHARGING\_CHARACTERISTICS ]
- [ AMBR ]
- [ APN\_CONFIGURATION\_PROFILE ]
- [ RAT\_FREQUENCY\_SELECTION\_PRIORITY ]

**AVP Flag**

M

## Subscription-Id

Identifier for the end-users subscription (IMSI, MSISDN, etc.).

**AVP Header**

443 0

**Vendor ID**

0

**VSA Type**

443

**AVP Type**

GROUPED

**Group Value**

- [ Subscription-Id-Type ]
- [ Subscription-Id-Data ]

**AVP Flag**

M

## Subscription-Id-Data

Used to identify the end user information.

**AVP Header**

444 0	
<b>Vendor ID</b>	0
<b>VSA Type</b>	444
<b>AVP Type</b>	UTF8STRING
<b>Group Value</b>	N/A
<b>AVP Flag</b>	M

---

## Subscription-Id-Type

Determines the type of identifier carried by the Subscription-Id AVP.

<b>AVP Header</b>	450 0
<b>Vendor ID</b>	0
<b>VSA Type</b>	450
<b>AVP Type</b>	ENUM. Supported values are:
END_USER_E164 (0)	
END_USER_IMSI (1)	
END_USER_SIP_URI (2)	
END_USER_NAI (3)	
END_USER_PRIVATE (4)	
<b>Group Value</b>	N/A
<b>AVP Flag</b>	M

---

## Subscription-Info

Contains the UE's subscription information.

**AVP Header**

642 10415

**Vendor ID**

10415

**VSA Type**

642

**■ Attributes**

**AVP Type**  
GROUPED

**Group Value**  
[ CALL\_ID\_SIP\_HEADER ]  
[ FROM\_SIP\_HEADER ]  
[ TO\_SIP\_HEADER ]  
[ RECORD\_ROUTE ]  
[ CONTACT ]

**AVP Flag**  
N/A

## Subs-Req-Type

This AVP indicates the type of subscription to notifications request in SNR.Subs-Req-Type.

**AVP Header**  
705 0

**Vendor ID**  
0

**VSA Type**  
705

**AVP Type**  
ENUM

**Group Value**  
N/A

**AVP Flag**  
M

## Supported-Applications

This AVP contains supported application identifiers of a Diameter node.

**AVP Header**  
631 10415

**Vendor ID**  
10415

**VSA Type**  
631

**AVP Type**  
GROUPED

**Group Value**  
[ AUTH\_APPLICATION\_ID ]  
[ ACCT\_APPLICATION\_ID ]  
[ VENDOR\_SPECIFIC\_APPLICATION\_ID ]

**AVP Flag**  
M

---

## Supported-Features

May inform the destination host about the features supported by the origin host.

**AVP Header**  
628 10415

**Vendor ID**  
10415

**VSA Type**  
628

**AVP Type**  
GROUPED

**Group Value**  
[ VENDOR\_ID ]  
[ FEATURE\_LIST\_ID ]  
[ FEATURE\_LIST ]

**AVP Flag**  
M

---

## Supported-Features-Resp

This AVP contains a list of supported features of the origin host (Answer message without M bit set).

**AVP Header**  
628 10415

**Vendor ID**  
10415

**VSA Type**  
628

**AVP Type**  
GROUPED

**Group Value**  
[ VENDOR\_ID\_RESP ]  
[ FEATURE\_LIST\_ID\_RESP ]  
[ FEATURE\_LIST\_RESP ]

**AVP Flag**  
N/A

---

## Supported-RAT-Type

This AVP contains one of E-UTRAN, UTRAN, GERAN, GAN, I-HSPA-EVOLUTION.

**■ Attributes**

**AVP Header**  
6005 10415

**Vendor ID**  
10415

**VSA Type**  
6005

**AVP Type**  
UTF8STRING

**Group Value**  
N/A

**AVP Flag**  
M

## Supported-Vendor-Id

Specifies the vendor ID other than the device vendor.

**AVP Header**  
265 0

**Vendor ID**  
0

**VSA Type**  
265

**AVP Type**  
UINT32

**Group Value**  
N/A

**AVP Flag**  
M

## Tap-Id

This AVP holds the Tap ID as provisioned by the DF.

**AVP Header**  
231 4491

**Vendor ID**  
4491

**VSA Type**  
231

**AVP Type**  
UTF8STRING

**Group Value**  
N/A

**AVP Flag**

M

---

## Tariff-Change-Usage

Defines whether units are used before or after a tariff change.

**AVP Header**

452 0

**Vendor ID**

0

**VSA Type**

452

**AVP Type**

ENUM. Supported values are:

UNIT\_BEFORE\_TARIFF\_CHANGE (0)

UNIT\_AFTER\_TARIFF\_CHANGE (1)

UNIT\_INDETERMINATE (2)

**Group Value**

N/A

**AVP Flag**

M

---

## Tariff-Time-Change

It is sent from the server to the client and includes the time in seconds since January 1, 1900, 00:00 UTC, when the tariff of the service is changed.

**AVP Header**

451 0

**Vendor ID**

0

**VSA Type**

451

**AVP Type**

TIME

**Group Value**

N/A

**AVP Flag**

M

---

## Teleservice-List

This AVP contains the service codes for the short message related teleservice for a subscriber.

**AVP Header**

**■ Attributes**

1486 10415

**Vendor ID**

10415

**VSA Type**

1486

**AVP Type**

GROUPED

**Group Value**

[ TS\_CODE ]

**AVP Flag**

M

## Terminal-Information

This AVP contains the information about the user's mobile equipment.

**AVP Header**

6002 10415

**Vendor ID**

10415

**VSA Type**

6002

**AVP Type**

GROUPED

**Group Value**

[ ESN ]

[ MEID ]

[ IMEI ]

[ SOFTWARE\_VERSION ]

**AVP Flag**

M

## Terminal-Type

This AVP contains a value of the User Class DHCP Option.

**AVP Header**

352 13019

**Vendor ID**

13019

**VSA Type**

352

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## Terminating-IOI

This AVP holds the Inter Operator Identifier for the originating network as generated by the S-CSCF in the home network of the terminating end user.

**AVP Header**

840 0

**Vendor ID**

0

**VSA Type**

840

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

## Termination-Cause

Indicates the reason why a session was terminated on the access device.

**AVP Header**

295 0

**Vendor ID**

0

**VSA Type**

295

**AVP Type**

ENUM. Supported values are:

DIAMETER\_LOGOUT (1)

DIAMETER\_SERVICE\_NOT\_PROVIDED (2)

DIAMETER\_BAD\_ANSWER (3)

DIAMETER\_ADMINISTRATIVE (4)

DIAMETER\_LINK\_BROKEN (5)

DIAMETER\_AUTH\_EXPIRED (6)

DIAMETER\_USER\_MOVED (7)

DIAMETER\_SESSION\_TIMEOUT (8)

## ■ Attributes

**Group Value**

N/A

**AVP Flag**

M

## TFT-Filter

This AVP contains the flow filter for one Traffic Flow Template (TFT) packet filter.

**AVP Header**

1012 10415

**Vendor ID**

10415

**VSA Type**

1012

**AVP Type**

IPFILTERRULE

**Group Value**

N/A

**AVP Flag**

M

## TFT-Packet-Filter-Information

This AVP contains the information from a single TFT packet filter including the evaluation precedence, the filter and the Type-of-Service/Traffic Class sent from the TPF to the CRF.

**AVP Header**

1013 10415

**Vendor ID**

10415

**VSA Type**

1013

**AVP Type**

GROUPED

**Group Value**

[ Precedence ]

[ TFT-Filter ]

[ ToS-Traffic-Class ]

**AVP Flag**

M

---

## Time-First-Usage

This AVP specifies the time in UTC format for the first IP packet to be transmitted and mapped to the current service data container.

**AVP Header**

2043 10415

**Vendor ID**

10415

**VSA Type**

2043

**AVP Type**

TIME

**Group Value**

N/A

**AVP Flag**

M

---

## Time-Last-Usage

This AVP specifies the time in UTC format for the last IP packet to be transmitted and mapped to the current service data container.

**AVP Header**

2044 10415

**Vendor ID**

10415

**VSA Type**

2044

**AVP Type**

TIME

**Group Value**

N/A

**AVP Flag**

M

---

## Time-Quota-Mechanism

Include this AVP in a Multiple-Services-Credit-Control AVP, when granting time quota.

**AVP Header**

1270 10415

**Vendor ID**

10415

**VSA Type**

1270

**■ Attributes**

**AVP Type**  
GROUPED

**Group Value**  
[ Base-Time-Interval ]  
[ Time-Quota-Type ]

**AVP Flag**  
M

## Time-Quota-Type

Indicate which time quota consumption mechanism shall be used for the associated category.

**AVP Header**  
1271 10415

**Vendor ID**  
10415

**VSA Type**  
1271

**AVP Type**  
ENUM

**Group Value**  
N/A

**AVP Flag**  
M

## Time-Stamps

This grouped AVP holds the time of the initial SIP request and the time of the response to the initial SIP Request.

**AVP Header**  
833 0

**Vendor ID**  
0

**VSA Type**  
833

**AVP Type**  
GROUPED

**Group Value**  
[ SIP\_REQUEST\_TIMESTAMP ]  
[ SIP\_RESPONSE\_TIMESTAMP ]

**AVP Flag**  
M

---

## Time-Usage

This AVP indicates the length of the current flow in seconds.

**AVP Header**

2045 10415

**Vendor ID**

10415

**VSA Type**

2045

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## TMGI

Contains the Temporary Mobile Group Identity allocated to a particular MBMS bearer service.

**AVP Header**

900 10415

**Vendor ID**

10415

**VSA Type**

900

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## To-SIP-Header

This AVP contains the information in the To header.

**AVP Header**

645 10415

**Vendor ID**

10415

**VSA Type**

645

**AVP Type**

OCTETSTRING

**■ Attributes****Group Value**

N/A

**AVP Flag**

N/A

## ToS-Traffic-Class

This AVP contains the Type-of-Service/Traffic-Class of a TFT packet filter.

**AVP Header**

1014 10415

**Vendor ID**

10415

**VSA Type**

1014

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## Trace-Collection-Entity

This AVP contains the IPv4 or IPv6 address of the Trace Collection Entity.

**AVP Header**

1452 10415

**Vendor ID**

10415

**VSA Type**

1452

**AVP Type**

ADDRESS

**Group Value**

N/A

**AVP Flag**

M

## Trace-Data

This AVP contains the information related to trace function.

**AVP Header**

1458 10415

**Vendor ID**

10415

**VSA Type**

1458

**AVP Type**

GROUPED

**Group Value**

- [ TRACE\_REFERENCE ]
- [ TRACE\_DEPTH\_LIST ]
- [ TRACE\_NE\_TYPE\_LIST ]
- [ TRACE\_INTERFACE\_LIST ]
- [ TRACE\_EVENT\_LIST ]
- [ OMC\_ID ]
- [ TRACE\_COLLECTION\_ENTITY ]

**AVP Flag**

M

---

## Trace-Depth

This AVP indicates whether entire signalling messages or just some IEs need to be recorded.

**AVP Header**

1462 10415

**Vendor ID**

10415

**VSA Type**

1462

**AVP Type**

ENUM. Supported values are:

- Minimum (0)
- Medium (1)
- Maximum (2)
- MinimumWithoutVendorSpecificExtension (3)
- MediumWithoutVendorSpecificExtension (4)
- MaximumWithoutVendorSpecificExtension (5)

**Group Value**

N/A

**AVP Flag**

M

---

## Trace-Depth-List

This AVP contains the list of Trade Depths per NE Type.

**AVP Header**

1460 10415

**Vendor ID**

10415

**VSA Type**

1460

**AVP Type**

GROUPED

**Group Value**

[ TRACE\_DEPTH\_PER\_NE\_TYPE ]

**AVP Flag**

M

---

## Trace-Depth-Per-NE-Type

This AVP contains the Network-Element-Type that is involved in a session trace, and the corresponding depth of trace for the specified Network-Element-Type.

**AVP Header**

145110415

**Vendor ID**

10415

**VSA Type**

1451

**AVP Type**

GROUPED

**Group Value**

[ NETWORK\_ELEMENT\_TYPE ]

[ TRACE\_DEPTH ]

**AVP Flag**

M

---

## Trace-Event-List

Trace-Event-List.

**AVP Header**

1465 10415

**Vendor ID**

10415

**VSA Type**

1465

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

---

## Trace-Interface-List

Trace-Interface-List.

**AVP Header**  
1464 10415

**Vendor ID**  
10415

**VSA Type**  
1464

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

---

## Trace-NE-Type-List

This AVP contains the concatenation of MCC MNC.

**AVP Header**  
1463 10415

**Vendor ID**  
10415

**VSA Type**  
1463

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

---

## Trace-NE-TypeList

Trace-NE-TypeList.

**■ Attributes**

**AVP Header**  
1461 10415

**Vendor ID**  
10415

**VSA Type**  
1461

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

---

## Trace-Reference

This AVP contains the concatenation of MCC MNC.

**AVP Header**  
1459 10415

**Vendor ID**  
10415

**VSA Type**  
1459

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

---

## Traffic-Data-Volumes

This AVP is used to allow the transmission of the IPCAN bearer container on encountering change on charging condition for this IP-CAN bearer.

**AVP Header**  
2046 10415

**Vendor ID**  
10415

**VSA Type**  
2046

**AVP Type**  
GROUPED

**Group Value**  
[ QOS\_INFORMATION ]

[ ACCOUNTING\_INPUT\_OCTETS ]  
 [ ACCOUNTING\_INPUT\_PACKETS ]  
 [ ACCOUNTING\_OUTPUT\_OCTETS ]  
 [ ACCOUNTING\_OUTPUT\_PACKETS ]  
 [ CHANGE\_CONDITION ]  
 [ CHANGE\_TIME ]  
 [ 3GPP\_USER\_LOCATION\_INFO ]

**AVP Flag**

M

## Transport-Class

Contains an integer used as an index pointing to a class of transport services to be applied.

**AVP Header**

311 13019

**Vendor ID**

13019

**VSA Type**

311

**AVP Type**

UNIT32

**Group Value**

N/A

**AVP Flag**

N/A

## Trigger

Triggers in the client and to identify the triggers which caused re-authorization in usage.

**AVP Header**

1264 10415

**Vendor ID**

10415

**VSA Type**

1264

**AVP Type**

GROUPED

**Group Value**

[ Trigger-Type ]

**AVP Flag**

M

---

## Trunk-Group-ID

This grouped AVP identifies the incoming and outgoing PSTN legs.

**AVP Header**

851 10415

**Vendor ID**

10415

**VSA Type**

851

**AVP Type**

GROUPED

**Group Value**

[ INCOMING\_TRUNK\_GROUP\_ID ]

[ OUTGOING\_TRUNK\_GROUP\_ID ]

**AVP Flag**

M

---

## TS-Code

This AVP contains the code identifying a single teleservice, a group of teleservices, or all teleservices.

**AVP Header**

1487 10415

**Vendor ID**

10415

**VSA Type**

1487

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## Tunnel-Assignment-Id

Used to indicate to the tunnel initiator the particular tunnel to which a session is to be assigned.

**AVP Header**

82 0

**Vendor ID**

0

**VSA Type**

82

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

## Tunnel-Client-Auth-Id

Specifies the name used by the tunnel initiator during the authentication phase of tunnel establishment.

**AVP Header**  
90 0

**Vendor ID**  
0

**VSA Type**  
90

**AVP Type**  
UTF8STRING

**Group Value**  
N/A

**AVP Flag**  
M

## Tunnel-Client-Endpoint

This AVP contains the address of the initiator end of the tunnel.

**AVP Header**  
66 0

**Vendor ID**  
0

**VSA Type**  
66

**AVP Type**  
UTF8STRING

**Group Value**  
N/A

**AVP Flag**  
M

## Tunnel-Header-Filter

Tunnel Header Filter.

**■ Attributes****AVP Header**

1036 10415

**Vendor ID**

10415

**VSA Type**

1036

**AVP Type**

IPFILTERRULE

**Group Value**

N/A

**AVP Flag**

M

## Tunnel-Header-Length

This AVP indicates the length of the tunnel header in octets.

**AVP Header**

1037 10415

**Vendor ID**

10415

**VSA Type**

1037

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## Tunnel-Information

This AVP contains the tunnel (outer) header information from a single IP flow.

**AVP Header**

1038 10415

**Vendor ID**

10415

**VSA Type**

1038

**AVP Type**

GROUPED

**Group Value**

[ TUNNEL\_HEADER\_LENGTH ]

[ TUNNEL\_HEADER\_FILTER ]

**AVP Flag**  
M

---

## Tunneling

Used to describe a compulsory tunnel service.

**AVP Header**  
401 0

**Vendor ID**  
0

**VSA Type**  
401

**AVP Type**  
GROUPED

**Group Value**

- [ TUNNEL\_TYPE ]
- [ TUNNEL\_MEDIUM\_TYPE ]
- [ TUNNEL\_CLIENT\_ENDPOINT ]
- [ TUNNEL\_SERVER\_ENDPOINT ]
- [ TUNNEL\_PREFERENCE ]
- [ TUNNEL\_CLIENT\_AUTH\_ID ]
- [ TUNNEL\_SERVER\_AUTH\_ID ]
- [ TUNNEL\_ASSIGNMENT\_ID ]
- [ TUNNEL\_PASSWORD ]
- [ TUNNEL\_PRIVATE\_GROUP\_ID ]

**AVP Flag**  
M

---

## Tunnel-Medium-Type

This AVP contains the transport medium to use when creating a tunnel for protocols (such as L2TP) that can operate over multiple transports.

**AVP Header**  
65 0

**Vendor ID**  
0

**VSA Type**  
65

**AVP Type**  
ENUM. Supported values are:  
IPv4\_IPversion4 (1)

**■ Attributes**

IPv6\_IPversion6 (2)  
 NSAP (3)  
 HDLC-8-bit\_multidrop (4)  
 BBN-1822 (5)  
 802-includes-all-802-media-plus-Ethernet-canonical\_format (6)  
 E163\_POTS (7)  
 E164\_SMDS\_Frame-Relay\_ATM (8)  
 F69\_Telex (9)  
 X121\_X25\_Frame-Relay (10)  
 IPX (11)  
 Appletalk (12)  
 Decnet\_IV (13)  
 Banyan\_Vines (14)  
 E164-with-NSAP-format-subaddress (15)

**Group Value**

N/A

**AVP Flag**

M

## Tunnel-Password

This AVP contains a password to be used to authenticate to a remote server.

**AVP Header**

69 0

**Vendor ID**

0

**VSA Type**

69

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## Tunnel-Preference

Used to identify the relative preference assigned to each tunnel when more than one set of tunneling AVPs is returned within separate Grouped-AVPs.

**AVP Header**

83 0  
**Vendor ID**  
0  
**VSA Type**  
83  
**AVP Type**  
UINT32  
**Group Value**  
N/A  
**AVP Flag**  
M

## Tunnel-Private-Group-Id

This AVP contains the group ID for a particular tunneled session.

**AVP Header**  
81 0  
**Vendor ID**  
0  
**VSA Type**  
81  
**AVP Type**  
OCTETSTRING  
**Group Value**  
N/A  
**AVP Flag**  
M

## Tunnel-Server-Auth-Id

Contains the name used by the tunnel terminator during the authentication phase of tunnel establishment.

**AVP Header**  
91 0  
**Vendor ID**  
0  
**VSA Type**  
91  
**AVP Type**  
UTF8STRING  
**Group Value**  
N/A  
**AVP Flag**  
M

## Tunnel-Server-Endpoint

This AVP contains the address of the server end of the tunnel.

**AVP Header**

67 0

**Vendor ID**

0

**VSA Type**

67

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

## Tunnel-Type

This AVP contains the tunneling protocol(s) to be used (in the case of a tunnel initiator) or in use (in the case of a tunnel terminator).

**AVP Header**

64 0

**Vendor ID**

0

**VSA Type**

64

**AVP Type**

ENUM. Supported values are:

Point-to-Point\_Tunneling\_Protocol-PPTP (1)

Layer-Two-Forwarding\_L2F (2)

Layer-Two-Tunneling\_Protocol-L2TP (3)

Ascend-Tunnel-Management-Protocol-ATMP (4)

Virtual-Tunneling-Protocol-VTP (5)

IP-Authentication-Header-in-the-Tunnel-mode\_AH (6)

IP-in-IP\_Encapsulation\_IP-IP (7)

Minimal\_IP-in-IP\_Encapsulation\_MIN-IP-IP (8)

IP\_Encapsulating\_Security\_Payload\_in\_the\_Tunnel-mode\_ESP (9)

Generic\_Route\_Encapsulation\_GRE (10)

Bay\_Dial\_Virtual\_Services-DVS (11)

IP-in-IP-Tunneling (12)

Virtual-LANs-VLAN (13)

**Group Value**

N/A

**AVP Flag**

M

## UAR-Flags

Contains a bit mask, if the bit 0 is set, it indicates that the request corresponds to an IMS Emergency Registration.

**AVP Header**

637 0

**Vendor ID**

0

**VSA Type**

637

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## ULA-Flags

The ULR-Flags AVP is of type Unsigned32 and it contains a bit mask.

**AVP Header**

6007 10415

**Vendor ID**

10415

**VSA Type**

6007

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## ULR-Flags

The ULR-Flags AVP is of type Unsigned32 and it contains a bit mask.

**AVP Header**

6006 10415

## ■ Attributes

**Vendor ID**  
10415

**VSA Type**  
6006

**AVP Type**  
UINT32

**Group Value**  
N/A

**AVP Flag**  
M

## UMTS-Vector

This AVP contains Authentication Information for UMTS.

**AVP Header**  
6018 10415

**Vendor ID**  
10415

**VSA Type**  
6018

**AVP Type**  
GROUPED

**Group Value**  
 [ ITEM\_NUMBER ]  
 [ RAND ]  
 [ XRES ]  
 [ AUTN ]  
 [ CONFIDENTIALITY\_KEY ]  
 [ INTEGRITY\_KEY ]

**AVP Flag**  
M

## Unit-Value

Cost estimate (type of money) of the service.

**AVP Header**  
445 0

**Vendor ID**  
0

**VSA Type**  
445

**AVP Type**

GROUPED

**Group Value**

[ VALUE\_DIGITS ]

[ EXPONENT ]

**AVP Flag**

M

---

## Usage-Monitoring-Information

This AVP contains the usage monitoring control information.

**AVP Header**

1067 10415

**Vendor ID**

10415

**VSA Type**

1067

**AVP Type**

GROUPED

**Group Value**

[ MONITORING\_KEY ]

[ GRANTED\_SERVICE\_UNIT ]

[ USED\_SERVICE\_UNIT ]

[ USAGE\_MONITORING\_LEVEL ]

[ USAGE\_MONITORING\_REPORT ]

[ USAGE\_MONITORING\_SUPPORT ]

**AVP Flag**

N/A

---

## Usage-Monitoring-Level

This AVP is used by the PCRF to indicate whether the usage monitoring instance applies to the IP-CAN session or to one or more PCC rules.

**AVP Header**

1068 10415

**Vendor ID**

10415

**VSA Type**

1068

**AVP Type**

ENUM. Supported values are:

SESSION\_LEVEL (0)

**■ Attributes**

PCC\_RULE\_LEVEL (1)

**Group Value**

N/A

**AVP Flag**

N/A

## Usage-Monitoring-Report

This AVP is used by the PCRF to indicate that accumulated usage is to be reported by the PCEF regardless of whether a usage threshold is reached for certain usage monitoring key.

**AVP Header**

1069 10415

**Vendor ID**

10415

**VSA Type**

1069

**AVP Type**

ENUM. Supported values are:

USAGE\_MONITORING\_REPORT\_REQUIRED (0)

**Group Value**

N/A

**AVP Flag**

N/A

## Usage-Monitoring-Support

This AVP is used by the PCRF to indicate whether usage monitoring should be disabled for certain Monitoring Key.

**AVP Header**

1070 10415

**Vendor ID**

10415

**VSA Type**

1070

**AVP Type**

ENUM. Supported values are:

USAGE\_MONITORING\_DISABLED (0)

**Group Value**

N/A

**AVP Flag**

N/A

---

## Used-Service-Unit

The used service unit measured from the point when service is active.

**AVP Header**

446 0

**Vendor ID**

0

**VSA Type**

446

**AVP Type**

GROUPED

**Group Value**

- [ TARIFF\_TIME\_CHANGE ]
- [ TARIFF\_CHANGE\_USAGE ]
- [ CC\_TIME ]
- [ CC\_MONEY ]
- [ CC\_TOTAL\_OCTETS ]
- [ CC\_INPUT\_OCTETS ]
- [ CC\_OUTPUT\_OCTETS ]
- [ CC\_SERVICE\_SPECIFIC\_UNITS ]

**AVP Flag**

M

---

## User-Authorization-Type

This AVP contains the type of user authorization being performed in a User Authorization operation.

**AVP Header**

623 10415

**Vendor ID**

10415

**VSA Type**

623

**AVP Type**

ENUM. Supported values are:

- REGISTRATION (0)
- DE\_REGISTRATION (1)
- REGISTRATION\_AND\_CAPABILITIES (2)

**Group Value**

N/A

**AVP Flag**

M

## User-Data

This AVP contains the user data requested in the PUR and SNR operations and the data to be modified in the UPR operations.

**AVP Header**

702 0

**Vendor ID**

0

**VSA Type**

702

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## User-Data-Already-Available

Indicates whether S-CSCF is already storing the user data or not.

**AVP Header**

624 10415

**Vendor ID**

10415

**VSA Type**

624

**AVP Type**

ENUM. Supported values are:

USER\_DATA\_NOT\_AVAILABLE (0)

USER\_DATA\_ALREADY\_AVAILABLE (1)

**Group Value**

N/A

**AVP Flag**

M

## User-Equipment-Info

Indicates the identification and capabilities of the terminal.

**AVP Header**

458 0

**Vendor ID**

0

**VSA Type**

458

**AVP Type**

GROUPED

**Group Value**

- [ USER\_EQUIPMENT\_INFO\_TYPE ]
- [ USER\_EQUIPMENT\_INFO\_VALUE ]

**AVP Flag**

M

## User-Equipment-Info-Type

Defines the type of information present in User-Equipment-Info-Value AVP.

**AVP Header**

459 0

**Vendor ID**

0

**VSA Type**

459

**AVP Type**

ENUM. Supported values are:

IMEISV (0)

MAC (1)

EUI64 (2)

MODIFIED\_EUI64 (3)

ESN (4)

MEID (5)

**Group Value**

N/A

**AVP Flag**

M

## User-Equipment-Info-Value

Defines the type of identifier used.

**AVP Header**

460 0

**Vendor ID**

0

**VSA Type**

460

**■ Attributes**

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M

## User-Id

User ID.

**AVP Header**  
1444 10415

**Vendor ID**  
10415

**VSA Type**  
1444

**AVP Type**  
UTF8STRING

**Group Value**  
N/A

**AVP Flag**  
M

## User-Identity

This grouped AVP contains either a Public-Identity AVP or an MSISDN AVP.

**AVP Header**  
700 10415

**Vendor ID**  
10415

**VSA Type**  
700

**AVP Type**  
GROUPED

**Group Value**  
[ PUBLIC\_IDENTITY ]  
[ MSISDN ]

**AVP Flag**  
M

---

## User-Name

Identification of the service user in a format consistent with the NAI specification.

**AVP Header**

1 0

**Vendor ID**

0

**VSA Type**

1

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## User-Password

This attribute indicates PAP for multiauth in PDG.

**AVP Header**

2 0

**Vendor ID**

0

**VSA Type**

2

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

---

## User-Session-Id

This AVP holds the session identifier.

**AVP Header**

830 10415

**Vendor ID**

10415

**VSA Type**

830

**AVP Type**

UTF8STRING

## ■ Attributes

**Group Value**

N/A

**AVP Flag**

M

## UTRAN-Vector

This AVP contains Authentication Information for UTRAN.

**AVP Header**

1415 10415

**Vendor ID**

10415

**VSA Type**

1415

**AVP Type**

GROUPED

**Group Value**

[ ITEM\_NUMBER ]

[ RAND ]

[ XRES ]

[ AUTN ]

[ CONFIDENTIALITY\_KEY ]

[ INTEGRITY\_KEY ]

**AVP Flag**

M

## V4-Transport-Address

Contains a single IPv4 address and a single port number.

**AVP Header**

454 13019

**Vendor ID**

13019

**VSA Type**

454

**AVP Type**

GROUPED

**Group Value**

[ FRAMED\_IP\_ADDRESS ]

[ PORT\_NUMBER ]

**AVP Flag**

N/A

## V6-Transport-Address

Contains a single IPv6 address and a single port number.

**AVP Header**

453 13019

**Vendor ID**

13019

**VSA Type**

453

**AVP Type**

GROUPED

**Group Value**

[ FRAMED\_IPV6\_PREFIX ]

[ PORT\_NUMBER ]

**AVP Flag**

N/A

## Validity-Time

Validity time of the granted service units. Measurement starts upon receipt of the Credit-Control-Answer Message containing this AVP.

**AVP Header**

448 0

**Vendor ID**

0

**VSA Type**

448

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

## Value-Digits

This AVP contains the significant digits of the number. If decimal values are needed to present the units, the scaling MUST be indicated with the related Exponent AVP.

**AVP Header**

447 0

**Vendor ID**

0

**VSA Type**

## ■ Attributes

447

**AVP Type**

INT64

**Group Value**

N/A

**AVP Flag**

M

## VBM-Address

VBM Address.

**AVP Header**

1460 10415

**Vendor ID**

10415

**VSA Type**

1460

**AVP Type**

ADDRESS

**Group Value**

N/A

**AVP Flag**

M

## Vendor-Id

Unique Identifier of the Vendor and contains the IANA "SMI Network Management Private Enterprise Codes" value assigned to the vendor of the Diameter application.

**AVP Header**

266 0

**Vendor ID**

0

**VSA Type**

266

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

M

---

## Vendor-Id-Resp

Unique identifier of the vendor.

**AVP Header**

266 10415

**Vendor ID**

10415

**VSA Type**

266

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**

N/A

---

## Vendor-Specific-Application-Id

Specifies the Vendor Specific Application ID and is used to advertise support of a vendor-specific Diameter Application.

**AVP Header**

260 0

**Vendor ID**

0

**VSA Type**

260

**AVP Type**

GROUPED

**Group Value**

[ VENDOR\_ID ]

[ AUTH\_APPLICATION\_ID ]

[ ACCT\_APPLICATION\_ID ]

**AVP Flag**

M

---

## Vendor-Specific-QoS-Profile-Template

This AVP defines the namespace of the QoS profile (indicated in the Vendor-ID AVP) followed by the specific value for the profile.

**AVP Header**

6064 0

**Vendor ID**

0

## ■ Attributes

**VSA Type**

6064

**AVP Type**

GROUPED

**Group Value**

[ VENDOR\_ID ]

[ QOS\_PROFILE\_TEMPLATE ]

**AVP Flag**

M

## Visited-Network-Identifier

This AVP contains an identifier that helps the home network to identify the visited network (for example, the visited network domain name).

**AVP Header**

600 10415

**Vendor ID**

10415

**VSA Type**

600

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## Visited-PLMN-Id

Contains the concatenation of MCC and MNC.

**AVP Header**

6008 10415

**Vendor ID**

10415

**VSA Type**

6008

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## VOA-Session-ID

VOA-Session-ID.

**AVP Header**

1464 10415

**Vendor ID**

10415

**VSA Type**

1464

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## VPLMN-Dynamic-Address-Allowed

This AVP indicates whether for this APN, the UE is allowed to use the PDN GW in the domain of the HPLMN only, or additionally, the PDN GW in the domain of the VPLMN.

**AVP Header**

1432 10415

**Vendor ID**

10415

**VSA Type**

1432

**AVP Type**

ENUM. Supported values are:

NOTALLOWED (0)

ALLOWED (1)

**Group Value**

N/A

**AVP Flag**

M

---

## Wildcarded-IMPU

This AVP contains a wild-carded Public User Identity stored in the HSS.

**AVP Header**

636 10415

**Vendor ID**

10415

## ■ Attributes

**VSA Type**

636

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

N/A

---

## Wildcarded-PSI

This AVP contains a wild-carded PSI stored in the HSS.

**AVP Header**

634 10415

**Vendor ID**

10415

**VSA Type**

634

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

M

---

## Wildcarded-Public-Identity

This AVP contains a Wildcarded PSI or Wildcarded Public User Identity stored in the HSS.

**AVP Header**

634 10415

**Vendor ID**

10415

**VSA Type**

634

**AVP Type**

UTF8STRING

**Group Value**

N/A

**AVP Flag**

N/A

---

## WiMAX-A-PCEF-Address

This AVP indicates the IP address of the A-PCEF to the PDF.

**AVP Header**

411 24757

**Vendor ID**

24757

**VSA Type**

411

**AVP Type**

ADDRESS

**Group Value**

N/A

**AVP Flag**

M

---

## WiMAX-PCC-R3-P-Capability

This AVP identifies in a CCR message the WiMAX capabilities supported by the ASN. In a CCA it identifies the options selected by the PCRF.

**AVP Header**

404 24757

**Vendor ID**

24757

**VSA Type**

404

**AVP Type**

GROUPED

**Group Value**

[ WIMAX\_RELEASE ]

[ ACCOUNTING\_PCC\_R3\_P\_CAPABILITY ]

**AVP Flag**

M

---

## WiMAX-QoS-Information

This AVP contains the WiMAX QoS information for ASN GW.

**AVP Header**

407 24757

**Vendor ID**

24757

**VSA Type**

407

**■ Attributes****AVP Type**

GROUPED

**Group Value**

- [ QOS\_CLASS\_IDENTIFIER ]
- [ MAX\_REQUESTED\_BANDWIDTH\_UL ]
- [ MAX\_REQUESTED\_BANDWIDTH\_DL ]
- [ GUARANTEED\_BITRATE\_UL ]
- [ GUARANTEED\_BITRATE\_DL ]
- [ PACKET\_INTERVAL ]
- [ PACKET\_SIZE ]

**AVP Flag**

M

## WiMAX-Release

This AVP indicates a WiMAX release formatted as major/minor.

**AVP Header**

301 24757

**Vendor ID**

24757

**VSA Type**

301

**AVP Type**

OCTETSTRING

**Group Value**

N/A

**AVP Flag**

M

## WLAN-Session-Id

This AVP contains the WLAN Session ID that is used to correlate PDG and WLAN AN charging data.

**AVP Header**

11009 0

**Vendor ID**

0

**VSA Type**

11009

**AVP Type**

UINT32

**Group Value**

N/A

**AVP Flag**  
M

---

## XRES

This AVP contains the XRES.

**AVP Header**  
1448 10415

**Vendor ID**  
10415

**VSA Type**  
1448

**AVP Type**  
OCTETSTRING

**Group Value**  
N/A

**AVP Flag**  
M



# Chapter 6

## RADIUS Attribute Definitions

---

This chapter presents RADIUS attribute definitions.

For the quick reference table, see the *RADIUS Attribute Quick Reference* appendix.

# Dictionary Types

The CLI command to specify the RADIUS dictionary is:

```
radius dictionary [ 3gpp | 3gpp2 | 3gpp2-835 | custom XX | standard |
starent | starent-835 | starent-vsa1 | starent-vsa1-835 ]
```

Keyword	Description
<b>customXX</b>	These dictionaries can be customized. Customization information can be obtained by contacting your local service representative. XX is the integer value of the custom dictionary.
	 <b>Important:</b> RADIUS dictionary custom23 should be used in conjunction with Enhanced Charging Service (ECS).
<b>standard</b>	This dictionary consists only of the attributes specified in RFC 2865, RFC 2866, and RFC 2869. It also supports 3GPP release 4 and 3GPP Release 5 - extended QoS format.
<b>3gpp</b>	This dictionary consists not only of all of the attributes in the standard dictionary, but also all of the attributes specified in 3GPP 32.015.
<b>3gpp2</b>	This dictionary consists of all of the attributes in the standard dictionary, and all of the attributes specified in IS-835-A.
<b>3gpp2-835</b>	This dictionary consists of all of the attributes in the standard dictionary, and all of the attributes specified in IS-835.
<b>starent-vsa1</b>	This dictionary consists of the 3GPP2 dictionary, and includes the vendor-specific attributes (VSAs) as well. The VSAs in this dictionary support a one-byte wide VSA Type field in order to support certain RADIUS applications. The one-byte limit allows support for only 256 VSAs (0 - 255) as shown in the following figure. This is the default dictionary.
<b>starent-vsa1-835</b>	This dictionary consists of the 3GPP2-835 dictionary, and includes the vendor-specific attributes (VSAs) as well. The VSAs in this dictionary support a one-byte wide VSA Type field in order to support certain RADIUS applications. The one-byte limit allows support for only 256 VSAs (0 - 255) as shown in the following figure.
<b>starent</b>	This dictionary consists of all of the attributes in the starent-vsa1 dictionary and incorporates additional VSAs by using a two-byte VSA Type field as shown in the following figure. This dictionary is the master-set of all of the attributes in all of the dictionaries supported by the system.
<b>starent-835</b>	This dictionary consists of all of the attributes in the starent-vsa1-835 dictionary and incorporates additional VSAs by using a two-byte VSA Type field. This dictionary is the master-set of all of the attributes in all of the -835 dictionaries supported by the system.

Figure 2. Difference in VSA Value Lengths per Dictionary

Starent Dictionary				Starent VSA 1 Dictionary			
0	1	2	3	0	1	2	3
01234567890123456789012345678901				01234567890123456789012345678901			
Type 26	<len> 3-255	<Vendor ID...> 0		Type 26	<len> 3-255	<Vendor ID...> 0	
<Vendor ID> 8164		<VSA Type> 0-65535		<Vendor ID> 8164	<VSA Type> 0-255	<VSA Length> 3-249	
<VSA Length> 5-249		<VSA Value>		<VSA Value>			

 **Important:** Customer-specific attributes are not documented in this reference. For information on customer-specific attributes, please contact your local service representative.

 **Important:** The length documented for each attribute is the length of the attribute's Value field (data portion) and not length of the attribute (Type + Length + Value fields).

# Attributes



**Important:** RADIUS attributes received by the system from the RADIUS server always take precedence over local-subscriber attributes and parameters configured on the system.

## 3GPP-Allocate-IPType

This attribute indicates whether the Access-Request is sent for user authentication only and/or for allocation of IPv4 and/or IPv6 address.

**Type**

26

**Vendor ID**

10415

**VSA Type**

27

**Length**

4

**Value**

Enumerated integer. Supported values are:

- none = 0
- ipv4 = 1
- ipv6 = 2
- ipv4-or-ipv6 = 3

## 3GPP-CAMEL-Charging-Info

This attribute contains the received CAMEL charging information. CAMEL charging information is applicable to GGSN.

**Type**

26

**Vendor ID**

10415

**VSA Type**

24

**Length**

1–255

**Value**

String

---

## 3GPP-CG-Address

This attribute identifies the charging gateway address.

**Type**  
26

**Vendor ID**  
10415

**VSA Type**  
4

**Length**  
4

**Value**  
IPv4 address

---

## 3GPP-Charging-ID

This attribute contains the charging ID for the PDP Context. This together with the GGSN-Address constitutes a unique identifier for the PDP context.

**Type**  
26

**Vendor ID**  
10415

**VSA Type**  
2

**Length**  
4

**Value**  
Unsigned integer

---

## 3GPP-Chrg-Char

This attribute contains the charging characteristics for this PDP Context received in the Create PDP Context Request Message (only available in R99 and later releases).

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

If this AVP is present in Access Accept message the locally configured APN value will be overridden.

**Type**  
26

**Vendor ID**  
10415

**VSA Type**  
13

**■ Attributes****Length**

4

**Value**

Opaque value

## 3GPP-GGSN-Address

This attribute contains IPv4 address of the GGSN.

**Type**

26

**Vendor ID**

10415

**VSA Type**

7

**Length**

4

**Value**

IPv4 address

## 3GPP-GGSN-IPv6-Address

For GGSN, it represents the GGSN IPv6 address that is used by the GTP control plane for the context establishment. For P-GW, it represents the P-GW IPv6 address that is used on S5/S8, S2a, S2b, or S2c control plane for the IP-CAN session establishment.

**Type**

26

**Vendor ID**

10415

**VSA Type**

16

**Length**

16

**Value**

Opaque value

## 3GPP-GGSN-Mcc-Mnc

This attribute contains the MCC-MNC of the network the GGSN belongs to.

**Type**

26

**Vendor ID**

10415

---

<b>VSA Type</b>	9
<b>Length</b>	1–6
<b>Value</b>	Opaque value

---

## 3GPP-IMEISV

This attribute identifies the International Mobile Equipment Identity and Software Version (IMEISV) number received from the mobile node (MN). It is sent in RADIUS authentication and accounting messages by GGSN.

<b>Type</b>	26
<b>Vendor ID</b>	10415
<b>VSA Type</b>	20
<b>Length</b>	16
<b>Value</b>	Opaque value

---

## 3GPP-IMSI

This attribute contains the IMSI identifying the mobile unit.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

<b>Type</b>	26
<b>Vendor ID</b>	10415
<b>VSA Type</b>	1
<b>Length</b>	1–15
<b>Value</b>	Opaque value

---

## 3GPP-IMSI-Mcc-Mnc

This attribute contains the MCC and MNC extracted from the user's IMSI (first 5 or 6 digits, as applicable from the presented IMSI).

## ■ Attributes

<b>Type</b>	26
<b>Vendor ID</b>	10415
<b>VSA Type</b>	8
<b>Length</b>	1–6
<b>Value</b>	Opaque value

---

## 3GPP-IPv6-DNS-Servers

This attribute contains list of IPv6 DNS server addresses.

<b>Type</b>	26
<b>Vendor ID</b>	10415
<b>VSA Type</b>	17
<b>Length</b>	16–240
<b>Value</b>	Opaque value

---

## 3GPP-MS-TimeZone

This attribute indicates the offset between universal time and local time in steps of 15 minutes of where the MS currently resides.

<b>Type</b>	26
<b>Vendor ID</b>	10415
<b>VSA Type</b>	23
<b>Length</b>	2
<b>Value</b>	Opaque value

---

## 3GPP-Negotiated-DSCP

This attribute is used to mark IP packets of PDP context on the Gi interface.

**Type**

26

**Vendor ID**

10415

**VSA Type**

26

**Length**

1

**Value**

Unsigned integer

---

## 3GPP-Negotiated-QoS-Profile

This attribute specifies the QoS profile to be used for the subscriber.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

10415

**VSA Type**

5

**Length**

In 10.2 and earlier releases: 1–35

In 11.0 and later releases: 1–39

**Value**

Opaque value

---

## 3GPP-NSAPI

This attribute specifies the value of the NSAPI of the PDP context that the RADIUS message is related to. It is encoded as its hexadecimal representation, using 1 UTF-8 encoded digit.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

10415

**VSA Type**

10

**■ Attributes****Length**

1

**Value**

Opaque value

## 3GPP-Packet-Filter

This compound attribute specifies the Packet Filter used for the PDP context.

**Type**

26

**Vendor ID**

10415

**VSA Type**

25

**Length**

65

**Value**

Contains the following subattributes:

### Identifier

Identifier of the packet filter.

**Type**

1

**Length**

1

**Value**

Unsigned integer

### Eval-Precedence

Evaluation precedence of the packet filter.

**Type**

2

**Length**

1

**Value**

Unsigned integer

### Length

Length of the packet filter.

**Type**

3

**Length**

1

**Value**

Unsigned integer

**Direction**

Direction of the packet filter.

**Type**

4

**Length**

1

**Value**

Unsigned integer

**IPv4-Address-Type**

This is a compound attribute specifying the IPv4 source address and netmask if the direction is downlink, or destination address and netmask if the direction is downlink, or destination address and netmask if the direction is uplink.

**Type**

5

**Length**

8

**Value**

Contains the following two subattributes:

**Address**

This attribute contains source address if direction value is set to Downlink, and destination address if direction value is set to Uplink.

**Type**

1

**Length**

4

**Value**

IPv4 address

**Netmask**

This attribute contains netmask of the IPv4 address.

**Type**

2

**Length**

4

**Value**

IPv4 address

**IPv6-Address-Type**

This is a compound attribute specifying the IPv6 source address and netmask if the direction is Downlink, or Destination Address and Netmask if the direction is Downlink, or Destination Address and Netmask if the direction is Uplink.

**Type**

6

**Length**

32

**Value**

Contains the following two subattributes:

**Address**

This attribute contains source address if direction value is set to Downlink, and destination address if direction value is set to Uplink.

**Type**

1

**Length**

16

**Value**

Opaque value

**Netmask**

This attribute contains the Netmask of the IPv6 address.

**Type**

2

**Length**

16

**Value**

Opaque value

**Protocol-Identifier-Or-Next-Header**

Specifies the IPv4 Protocol Identifier or IPv6 Next Header.

**Type**

7

**Length**

1

**Value**

Unsigned integer

---

## Destination-Port

Specifies the Destination Port number of the packet filter.

**Type**

8

**Length**

2

**Value**

An integer in network byte order

---

## Destination-Port-Range

This is a compound attribute and specifies the destination port range.

**Type**

9

**Length**

4

**Value**

Contains the following two subattributes:

---

### Lower

Specifies the lower range of the destination port of the packet filter.

**Type**

1

**Length**

2

**Value**

Unsigned integer

---

### Higher

Specifies the higher range of the destination port of the packet filter.

**Type**

2

**Length**

2

**Value**

Unsigned integer

---

## Source-Port

Specifies the source port number of the packet filter.

<b>Type</b>	10
<b>Length</b>	2
<b>Value</b>	Unsigned integer

---

## Source-Port-Range

Specifies the source port range.

<b>Type</b>	11
<b>Length</b>	4
<b>Value</b>	Contains the following two subattributes:

---

### Lower

Specifies lower range of the source port of the packet filter.

<b>Type</b>	1
<b>Length</b>	2
<b>Value</b>	Unsigned integer

---

### Higher

Specifies higher range of the source port of the packet filter.

<b>Type</b>	2
<b>Length</b>	2
<b>Value</b>	Unsigned integer

---

## Security-Parameter-Index

Specifies the IPSec Security Parameter Index(IPv6).

<b>Type</b>	12
<b>Length</b>	4
<b>Value</b>	

Unsigned integer

---

## Type-Of-Service

This is a compound attribute and specifies the Type of Service/ Traffic Class.

**Type**

13

**Length**

2

**Value**

Contains the following two subattributes:

---

### Value

Specifies the Type of Service/Traffic Class Value.

**Type**

1

**Length**

1

**Value**

Unsigned integer

---

### Mask

Specifies the Type of Service/Traffic Class Mask.

**Type**

2

**Length**

1

**Value**

Unsigned integer

---

## Flow-Label

Specifies the IPv6 Flow Label.

**Type**

14

**Length**

3

**Value**

Opaque value

---

## 3GPP-PDP-Type

This attribute identifies the PDP Context type.

**Type**

26

**Vendor ID**

10415

**VSA Type**

3

**Length**

4

**Value**

Enumerated integer. Supported values are:

- ipv4 = 0
- ppp = 1
- ipv6 = 2
- ipv4-or-ipv6 = 3

---

## 3GPP-RAT-Type

This attribute indicates which Radio Access Technology is currently serving the UE.

**Type**

26

**Vendor ID**

10415

**VSA Type**

21

**Length**

1

**Value**

Opaque value

---

## 3GPP-Selection-Mode

This attribute contains the selection mode for this PDP Context received in the Create PDP Context Request message as an UTF-8 encoded character.

**Type**

26

**Vendor ID**

10415

**VSA Type**

12

**Length**

1

**Value**

Opaque value

## 3GPP-Session-Stop-Ind

The presence of this attribute indicates to the AAA server that the last PDP context of a session is released and that the PDP session has been terminated.

**Type**

26

**Vendor ID**

10415

**VSA Type**

11

**Length**

1

**Value**

Opaque value

## 3GPP-SGSN-Address

This attribute contains IPv4 address of the SGSN.

**Type**

26

**Vendor ID**

10415

**VSA Type**

6

**Length**

4

**Value**

IPv4 address

## 3GPP-SGSN-IPv6-Address

For GGSN, it represents the SGSN IPv6 address that is used by the GTP control plane for the handling of control messages. For P-GW, it represents the IPv6 address of the S-GW, trusted non-3GPP IP access or ePDG that is used on S5/S8, S2a, or S2b for the handling of control messages. The address may be used to identify the PLMN to which the user is attached.

**Type**

26

## ■ Attributes

<b>Vendor ID</b>	10415
<b>VSA Type</b>	15
<b>Length</b>	16
<b>Value</b>	Opaque value

---

## 3GPP-SGSN-Mcc-Mnc

For GPRS the MCC and the MNC of the SGSN.

<b>Type</b>	26
<b>Vendor ID</b>	10415
<b>VSA Type</b>	18
<b>Length</b>	1–6
<b>Value</b>	String

---

## 3GPP-Teardown-Indicator

If this value is set to 1 in disconnect-request, the whole correlated sessions would be disconnected.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

<b>Type</b>	16
<b>Vendor ID</b>	10415
<b>VSA Type</b>	19
<b>Length</b>	1
<b>Value</b>	Opaque value

---

## 3GPP-User-Location-Info

GTP user location information attribute for the subscriber session.

<b>Type</b>	26
<b>Vendor ID</b>	10415
<b>VSA Type</b>	22
<b>Length</b>	In 10.2 and earlier releases: 8 In Releases 11.0, 12.0 and 12.1, the length is 37.
<b>Value</b>	Opaque value

---

## 3GPP2-835-Release-Indicator

3GPP2-895- Standard Release-Indicator, reason/cause for session release.

<b>Type</b>	26
<b>Vendor ID</b>	5535
<b>VSA Type</b>	24
<b>Length</b>	4
<b>Value</b>	Enumerated integer. Supported values are: <ul style="list-style-type: none"> <li>• Unknown = 0</li> <li>• PPP-Timeout = 1</li> <li>• Handoff = 2</li> <li>• PPP-Termination = 3</li> <li>• Mobile-IP-Registration-Failure = 4</li> <li>• Active-To-Dormant = 5</li> </ul>

---

## 3GPP2-Acct-Session-Time

The total amount of time spent in the Active state, in seconds. This attribute has the same type as Acct-Session-Time, and thus conforms to IS-835.

<b>Type</b>	46
<b>Vendor ID</b>	N/A
<b>VSA Type</b>	

**■ Attributes**

N/A

**Length**

4

**Value**

Unsigned integer

## 3GPP2-Active-Time

The total period of time spent in the Active state, in seconds.

**Type**

26

**Vendor ID**

5535

**VSA Type**

49

**Length**

4

**Value**

Unsigned integer

## 3GPP2-Active-Time-Corrected

3GPP2 Active session time value.

**Type**

26

**Vendor ID**

5535

**VSA Type**

49

**Length**

4

**Value**

Unsigned integer

## 3GPP2-Airlink-Record-Type

This attribute indicates the most recent type of Airlink Record to be received for this subscriber's connection.

**Type**

26

**Vendor ID**

5535

**VSA Type**

40

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Connection-Setup = 1
- Active-Start = 2
- Active-Stop = 3
- SDB = 4
- BCMCS-Connection-Setup = 5
- BCMCS-Active-Start = 6
- BCMCS-Active-Stop = 7

## 3GPP2-Airlink-Sequence-Number

This represents the sequence number of an Airlink Record and is incremented (modulo 256) by the PCF for each Airlink Record. The sequence number is unique for a given RP Session ID, PCF ID, and MSID.

**Type**

26

**Vendor ID**

5535

**VSA Type**

42

**Length**

4

**Value**

Unsigned integer

## 3GPP2-Air-QOS

This attribute identifies airlink QOS associated with the user data. The least significant 4 bits hold the QOS priority as defined in C.S0001-A in the subscriber profile.

**Type**

26

**Vendor ID**

5535

**VSA Type**

39

**Length**

4

## ■ Attributes

**Value**

Unsigned integer

## 3GPP2-Allowed-Diffserv

This attribute specifies if the user is able to mark packets with AF and/or EF. The Max Class specifies that the user may mark packets with a Class Selector Code Point that is less than or equal to Max Class.

**Type**

26

**Vendor ID**

5535

**VSA Type**

73

**Length**

24

**Value**

Contains the following three subattributes:

### Flags

Allowed DSCP flag.

**Type**

1

**Length**

2

**Value**

Enumerated integer. Supported values are:

- Allow\_AF\_EF\_Exp = 0xE000
- Allow\_AF\_EF = 0xC000
- Allow\_AF\_Exp = 0xA000
- Allow\_EF\_Exp = 0x6000
- Allow\_AF = 0x8000
- Allow\_EF = 0x4000
- Allow\_Exp = 0x2000
- Allow\_None = 0x0

### Max-Class

Allowed max dscp.

**Type**

2

**Length**

2

**Value**

Enumerated integer. Supported values are:

- Best-Effort = 0x0
- AF11 = 0x2800
- AF12 = 0x3000
- AF13 = 0x3800
- AF21 = 0x4800
- AF22 = 0x5000
- AF23 = 0x5800
- AF31 = 0x6800
- AF32 = 0x7000
- AF33 = 0x7800
- AF41 = 0x8800
- AF42 = 0x9000
- AF43 = 0x9800
- EF = 0xb800
- Class1 = 0x2000
- Class2 = 0x4000
- Class3 = 0x6000
- Class4 = 0x8000
- Class5 = 0xa000
- Class6 = 0xc000
- Class7 = 0xe000

**RT-Marking**

Allowed max dscp rev. tun.

**Type**

3

**Length**

2

**Value**

Enumerated integer. Supported values are:

- Best-Effort = 0x0
- AF11 = 0x2800
- AF12 = 0x3000
- AF13 = 0x3800
- AF21 = 0x4800

## ■ Attributes

- AF22 = 0x5000
- AF23 = 0x5800
- AF31 = 0x6800
- AF32 = 0x7000
- AF33 = 0x7800
- AF41 = 0x8800
- AF42 = 0x9000
- AF43 = 0x9800
- EF = 0xb800
- Class1 = 0x2000
- Class2 = 0x4000
- Class3 = 0x6000
- Class4 = 0x8000
- Class5 = 0xa000
- Class6 = 0xc000
- Class7 = 0xe000

## 3GPP2-Allowed-Persistent-TFTs

This attribute displays the 3GPP2 Allowed Persistent Traffic Flow Templates.

**Type**

26

**Vendor ID**

5535

**VSA Type**

89

**Length**

4

**Value**

Unsigned integer

## 3GPP2-Alternate-Billing-ID

This attribute is currently not supported.

## 3GPP2-Always-On

This attribute, when set to Active, indicates that the subscriber's session should be kept up regardless of the idle time as long as the subscriber is reachable. Reachability is ascertained using LCP keepalive messages.

---

<b>Type</b>	26
<b>Vendor ID</b>	5535
<b>VSA Type</b>	78
<b>Length</b>	4
<b>Value</b>	<p>Enumerated integer. Supported values are:</p> <ul style="list-style-type: none"> <li>• Inactive = 0</li> <li>• Active = 1</li> </ul>

---

## 3GPP2-Auth-Flow-Profile-Id

This compound attribute is a list of flow profile IDs.

<b>Type</b>	26
<b>Vendor ID</b>	5535
<b>VSA Type</b>	131
<b>Length</b>	6
<b>Value</b>	Contains the following three subattributes:

---

### Profile-Id-Forward

This attribute specifies a list of Forward Flow Profile IDs that the user is allowed to specify/request in a QoS Sub Blob.

<b>Type</b>	1
<b>Length</b>	2
<b>Value</b>	Unsigned integer

---

### Profile-Id-Reverse

This attribute specifies a list of Reverse Flow Profile IDs that the user is allowed to specify/request in a QoS Sub Blob.

<b>Type</b>
-------------

## ■ Attributes

<b>Length</b>	2
<b>Value</b>	2
	Unsigned integer

---

**Profile-Id-Bi-Direction**

This attribute specifies the list of Bi-Direction Flow Profile IDs that the user is allowed to specify/request in a QoS Sub Blob.

<b>Type</b>	3
<b>Length</b>	2
<b>Value</b>	Unsigned integer

---

**3GPP2-Auth-QoS-Profile-Id**

This attribute specifies the authorized QoS profile ID.

<b>Type</b>	26
<b>Vendor ID</b>	5535
<b>VSA Type</b>	131
<b>Length</b>	1
<b>Value</b>	1

---

**3GPP2-Bad-PPP-Frame-Count**

The total number of PPP frames from the MS dropped by the PDSN due to uncorrectable errors.

<b>Type</b>	26
<b>Vendor ID</b>	5535
<b>VSA Type</b>	25
<b>Length</b>	4

**Value**

Unsigned integer

---

## 3GPP2-BCMCS-Auth-Parameters

This is a grouped AVP with Authentication signature, Sequence number, and timestamp required to validate each flow in a BCMCS flow registration request. Each flow is validated using the procedure described in 3GPP2 standard C.S0054-0\_v1.0. This information is configured on a per subscriber basis.

**Type**

26

**Vendor ID**

5535

**VSA Type**

99

**Length**

38

**Value**

Contains the following three subattributes:

---

### BAK-Sequence-Number

**Type**

1

**Length**

1

**Value**

Opaque value

---

### Timestamp

**Type**

2

**Length**

33

**Value**

Opaque value

---

### Auth-Signature

**Type**

3

**Length**

4

**Value**

Unsigned integer

---

## 3GPP2-BCMCS-BSN-Session-Info

This is a grouped AVP containing information about the established flows. This includes the multicast address, port, compression status of the flow, and the content server address.

**Type**

26

**Vendor ID**

5535

**VSA Type**

103

**Length**

46

**Value**

Contains the following 11 subattributes:

---

### Flow-ID

**Type**

1

**Length**

2-4

**Value**

Opaque value

---

### Mcast-IP-Addr

**Type**

2

**Length**

4

**Value**

IPv4 address

---

### Mcast-Port

**Type**

3

**Length**

2

**Value**

Unsigned integer

---

## Header-Compression-Algorithm

**Type**

4

**Length**

4

**Value**

Enumerated integer. Supported values are:

- No\_header\_compression = 0
- ROHC\_U\_Mode = 1

---

## CID-Type-Attribute

**Type**

5

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Small\_CID = 0
- Large\_CID = 1

---

## MAX-CID

**Type**

6

**Length**

2

**Value**

Unsigned integer

---

## Compression-Profile

**Type**

7

**Length**

2

**Value**

Unsigned integer

---

## MAX-Header-Size

**Type**

8

**■ Attributes**

**Length** 2  
**Type** Unsigned integer

**MRRU**

**Type** 9  
**Length** 2  
**Value** Unsigned integer

**Content-Server-Source-IP-Address**

**Type** 10  
**Length** 4  
**Value** IPv4 address

**Content-Server-Source-IPv6-Address**

**Type** 11  
**Length** 16  
**Value** Opaque value

**3GPP2-BCMCS-Capability**

This AVP defines the specific BCMCS protocol revision the PDSN supports.

**Type** 26  
**Vendor ID** 5535  
**VSA Type** 101  
**Length** 4  
**Value**

Contains the following subattribute:

---

### BCMCS-Protocol-Revision

**Type**

1

**Length**

2

**Value**

Enumerated integer. Supported value is:

- Release\_0 = 1

---

## 3GPP2-BCMCS-Common-Session-Info

This is a grouped AVP which specifies the program start time, end time and the allowed registration time on a per flow basis.

**Type**

26

**Vendor ID**

5535

**VSA Type**

102

**Length**

18

**Value**

Contains the following five subattributes:

---

### Flow-ID

**Type**

1

**Length**

2–4

**Value**

Opaque value

---

### Program-Start-Time

**Type**

2

**Length**

4

**Value**

Unsigned integer

---

## Program-End-Time

**Type** 3  
**Length** 4  
**Value** Unsigned integer

---

## Program-Allowed-Registration-Time

**Type** 4  
**Length** 4  
**Value** Unsigned integer

---

## Auth-Required-Flag

**Type** 5  
**Length** 2  
**Value** Enumerated integer. Supported values are:

- Authorization\_not\_required = 0
- Authorization\_required = 1

---

## 3GPP2-BCMCS-Flow-ID

This attribute specifies the BCMCS\_FLOW\_ID.

**Type** 26  
**Vendor ID** 5535  
**VSA Type** 100  
**Length** 2–4  
**Value** String

---

## 3GPP2-BCMCS-Flow-Transmit-Time

The total BCMCS flow transmission time in seconds.

**Type**

26

**Vendor ID**

5535

**VSA Type**

107

**Length**

4

**Value**

Unsigned integer

---

## 3GPP2-BCMCS-Mcast-IP-Addr

This attribute contains the multicast IP address of the BCMCS flow as it would appear in the source or destination field of an IP header.

**Type**

26

**Vendor ID**

5535

**VSA Type**

109

**Length**

4

**Value**

IPv4 address

---

## 3GPP2-BCMCS-Mcast-Port

The multicast port for the BCMCS flow.

**Type**

26

**Vendor ID**

5535

**VSA Type**

110

**Length**

2

**Value**

Unsigned integer

---

## 3GPP2-BCMCS-Reason-Code

This attribute specifies the reason to send the RADIUS Access-Accept message.

**Type**

26

**Vendor ID**

5535

**VSA Type**

105

**Length**

1

**Value**

Opaque value

---

## 3GPP2-BCMCS-RN-Session-Info

This is a grouped AVP which contains the encryption mechanism, BAK (Broadcast access key), BAK\_ID, BAK expire time and authorization required flag. This attribute specifies the session information that needs to be known only by the RN.

**Type**

26

**Vendor ID**

5535

**VSA Type**

104

**Length**

31

**Value**

Contains the following six subattributes:

---

### Flow-ID

**Type**

1

**Length**

2-4

**Value**

Opaque value

---

### BCMCS-Encryption-Mechanism-Attribute

**Type**

2

**Length**

2

**Value**

Enumerated integer. Supported values are:

- High\_layer\_encryption\_in\_CS = 0
- Link\_layer\_encryption\_in\_RN = 1

---

**BCMCS-BAK-ID-Attribute****Type**

3

**Length**

1

**Value**

Unsigned integer

---

**BCMCS-BAK****Type**

4

**Length**

16

**Value**

Opaque value

---

**BCMCS-BAK-Expire-Time****Type**

5

**Length**

4

**Value**

Unsigned integer

---

**BCMCS-Session-Bandwidth-attribute****Type**

6

**Length**

2

**Value**

Unsigned integer

---

## 3GPP2-BCMCS-Subnet-VSA-Format

This attribute is deprecated.

---

## 3GPP2-Beginning-Session

3GPP2 Beginning Session will be TRUE or FALSE depending on if this is a new session.

**Type**

26

**Vendor ID**

5535

**VSA Type**

51

**Length**

4

**Value**

Enumerated integer. Supported values:

- False = 0
- True = 1

---

## 3GPP2-BSID

The base station ID.

**Type**

26

**Vendor ID**

5535

**VSA Type**

10

**Length**

6–12

**Value**

Opaque value

---

## 3GPP2-Carrier-ID

A 5 or 6-byte identifier of the visited PDSN comprising of a 3 byte Mobile Country Code (MCC) followed by a 2 or 3 byte Mobile Network Code (MNC) of the visited carrier. This value is configured locally in the visited carrier's PDSN.

**Type**

26

**Vendor ID**

5535

**VSA Type**

142

**Length**

5–6

**Value**

Opaque value

## 3GPP2-Comp-Tunnel-Indicator

This attribute indicates the invocation of a compulsory tunnel established on behalf of the MS for providing private network and/or ISP access during a single packet data connection. Normal PPP sessions will show No Tunnel. L2TP, IPinIP, and IP-GRE tunnels will show Non-Secure-Tunnel. IPSEC support will show Secure-Tunnel.

**Type**

26

**Vendor ID**

5535

**VSA Type**

23

**Length**

4

**Value**

Enumerated integer. Supported values are:

- No Tunnel = 0
- Non-Secure-Tunnel = 1
- Secure-Tunnel = 2

## 3GPP2-Container

A compound attribute that encapsulates the User Data Record for an Airlink Event.

**Type**

26

**Vendor ID**

5535

**VSA Type**

6

**Length**

Varies

**Value**

Embedded attributes as defined in “Wireless IP Network Standard – 3GPP2.P.S0001-A-1” [6].

Format of the 3GPP2-Container attribute:

**■ Attributes**

Embedded attributes will contain 0 or 1 of the following attributes:

- 3GPP2-User-Zone
- 3GPP2-Air-QOS
- NAS-IP-Address
- 3GPP2-Serving-PCF
- 3GPP2-BSID
- Acct-Output-Octets
- Acct-Output-Gigawords
- Acct-Input-Octets
- Acct-Input-Gigawords
- SNA1-PPP-Unfr-data-In-Oct
- SNA1-PPP-Unfr-data-Out-Oct
- 3GPP2-Bad-PPP-Frame-Count
- 3GPP2-Active-Time
- 3GPP2-Number-Active-Transitions
- 3GPP2-SDB-Input-Octets
- 3GPP2-SDB-Output-Octets
- 3GPP2-Num-SDB-Input
- 3GPP2-Num-SDB-Output
- 3GPP2-Num-Bytes-Received-Total
- 3GPP2-MIP-Sig-Octet-Count-In
- 3GPP2-MIP-Sig-Octet-Count-Out

Embedded attributes inside the 3GPP2-Container attribute have the same format as those outside the 3GPP2-Container attribute.

---

## 3GPP2-Correlation-Id

This attribute contains an ID that correlates all accounting sessions authorized for this NAI by this access request.

This attribute is also accepted in CoA request and response messages to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

5535

**VSA Type**

44

**Length**

1–253

**Value**

String

---

## 3GPP2-Correlation-Id-Old

Custom-11 style correlation ID.

**Type**

26

**Vendor ID**

5535

**VSA Type**

40

**Length**

1–251

**Value**

Opaque value

---

## 3GPP2-DCCH-Frame-Size

Specifies the DCCH frame size.

**Type**

26

**Vendor ID**

5535

**VSA Type**

50

**Length**

4

**Value**

Enumerated integer. Supported values are:

- None = 0
- 5s = 1
- 20ms = 2

---

## 3GPP2-Diff-Service-Class-Option

This is the DSCP (Differentiated Service Code Point) value as defined in the 3GPP2 standard. The DSCP values are assigned for different classes of traffic so that each traffic class can be given different priorities (QoS).

**Type**

26

**Vendor ID**

5535

## ■ Attributes

<b>VSA Type</b>	5
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## 3GPP2-Disconnect-Reason

This attribute indicates the reason for disconnecting the user. This attribute may be present in the RADIUS Disconnect-request Message from Home RADIUS server to the PDSN.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

<b>Type</b>	26
<b>Vendor ID</b>	5535
<b>VSA Type</b>	96
<b>Length</b>	4
<b>Value</b>	Enumerated integer. Supported values are: <ul style="list-style-type: none"> <li>• MS_Mobility_Detection = 1</li> <li>• All other values are reserved.</li> </ul>

---

## 3GPP2-DNS-Server-IP-Address

DNS server IP address. Used in custom dictionary.

<b>Type</b>	26
<b>Vendor ID</b>	5535
<b>VSA Type</b>	117
<b>Value</b>	Contains the following four subattributes:

---

### Primary-DNS-Server-IP

Primary DNS Server IP address.

<b>Type</b>	1
-------------	---

---

<b>Length</b>	4
<b>Value</b>	IPv4 address

---

## Secondary-DNS-Server-IP

Secondary DNS Server IP address.

<b>Type</b>	2
<b>Length</b>	4
<b>Value</b>	IPv4 address

---

## Flag

M bit set to 1 indicates to the PDSN that primary and secondary IP addresses provided by the Home RADIUS server should override the primary and secondary IP addresses provided also by the visited RADIUS server.

<b>Type</b>	3
<b>Length</b>	1
<b>Value</b>	Unsigned integer

---

## Entity-Type

Network Entity that inserted in the DNS server ID address. Currently the following types are defined. HAAA = 1, VAAA = 1.

<b>Type</b>	4
<b>Length</b>	1
<b>Value</b>	Unsigned integer

---

## 3GPP2-DNS-Server-IPV6-Addr

DNS server IPv6 address.

<b>Type</b>	26
<b>Vendor ID</b>	

**■ Attributes**

5535

**VSA Type**

214

**Length**

0–50

**Value**

Contains the following four subattributes:

---

**Primary-DNS-Server-IPv6**

Primary DNS server IPv6 address.

**Type**

1

**Length**

2

**Value**

Opaque value

---

**Secondary-DNS-Server-IPv6**

Secondary IPv6 DNS server IP address.

**Type**

2

**Length**

2

**Value**

Opaque value

---

**Flag-IPv6**

M bit set to 1 indicates to the PDSN that Primary and Secondary IPv6 addresses provided by the Home RADIUS server should override the Primary and Secondary IPv6 addresses provided also by the visited RADIUS server.

**Type**

3

**Length**

1

**Value**

Unsigned integer

---

**Entity-Type-IPv6**

Network Entity that inserted in the DNS server ID address. Either HAAA = 1, VAAA = 1.

**Type**

4

**Length**

1

**Value**

Unsigned integer

## 3GPP2-DNS-Update-Required

This attribute indicates whether the HA needs to send the DNS update to the DNS server.

**Type**

26

**Vendor ID**

5535

**VSA Type**

75

**Length**

4

**Value**

Enumerated integer. Supported values are:

- No = 0 — HA does not need to send DNS update
- Yes = 1 — HA needs to send DNS update

## 3GPP2-ESN

This attribute contains the Electronic Serial Number (ESN) of the Mobile Station.

**Type**

26

**Vendor ID**

5535

**VSA Type**

52

**Length**

1–15

**Value**

Opaque value

## 3GPP2-FA-Address

This attribute indicates if compulsory tunneling is to be employed on behalf of a subscriber. Usually compulsory tunneling is employed when a subscriber cannot initiate a tunnel itself, usually because the subscriber's device does not support tunneling. Contains an IP address as it would appear in the IP header.

**■ Attributes**

<b>Type</b>	26
<b>Vendor ID</b>	5535
<b>VSA Type</b>	79
<b>Length</b>	4
<b>Value</b>	IPv4 address

---

## 3GPP2-FEID

This attribute specifies the FEID value.

<b>Type</b>	26
<b>Vendor ID</b>	5535
<b>VSA Type</b>	216
<b>Length</b>	0–16
<b>Value</b>	Opaque value

---

## 3GPP2-Flow-Id

This attribute displays the 3GPP2-Flow-Id-parameter.

<b>Type</b>	26
<b>Vendor ID</b>	5535
<b>VSA Type</b>	144
<b>Value</b>	Contains the following two subattributes:

---

### Direction

This attribute identifies the IP flow id direction.

<b>Type</b>	1
-------------	---

**Length**

2

**Value**

Enumerated integer. Supported values are:

- Forward = 0
- Reverse = 1
- Both = 2

**Flow-Id**

This attribute identifies the IP flow.

**Type**

2

**Length**

2

**Value**

Unsigned integer

**3GPP2-Flow-Status**

This attribute displays the 3GPP2 Flow Status.

**Type**

26

**Vendor ID**

5535

**VSA Type**

145

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Active = 0
- Inactive = 1

**3GPP2-Forward-Fundamental-Rate**

As defined in “Wireless IP Network Standard – 3GPP2.P.S0001-A-1”.

**Type**

26

**Vendor ID**

5535

## ■ Attributes

<b>VSA Type</b>	
14	
<b>Length</b>	
4	
<b>Value</b>	
	Unsigned integer

---

## 3GPP2-Forward-Fundamental-RC

The format and structure of the RADIUS channel in the forward direction. A set of forward transmission formats that are characterized by data rates, modulation characterized, and spreading rates.

<b>Type</b>	
26	
<b>Vendor ID</b>	
5535	
<b>VSA Type</b>	
20	
<b>Length</b>	
4	
<b>Value</b>	
	Unsigned integer

---

## 3GPP2-Forward-Mux-Option

Forward direction multiplexer option.

<b>Type</b>	
26	
<b>Vendor ID</b>	
5535	
<b>VSA Type</b>	
12	
<b>Length</b>	
4	
<b>Value</b>	
	Unsigned integer

---

## 3GPP2-Forward-Traffic-Type

Specifies the forward traffic type.

<b>Type</b>	
26	

<b>Vendor ID</b>	5535
<b>VSA Type</b>	17
<b>Length</b>	4
<b>Value</b>	<p>Enumerated integer. Supported values are:</p> <ul style="list-style-type: none"> <li>• Primary = 0</li> <li>• Secondary = 1</li> </ul>

---

## 3GPP2-Fundamental-Frame-Size

This attribute indicates the fundamental frame size. The fundamental channel has the choice of 5 or 20 ms size. The 5 ms frame size allows fast response for short signaling messages (short frame can be decoded quickly). However, depending on configuration, the fundamental may not be present.

<b>Type</b>	26
<b>Vendor ID</b>	5535
<b>VSA Type</b>	19
<b>Length</b>	4
<b>Value</b>	<p>Enumerated integer. Supported values are:</p> <ul style="list-style-type: none"> <li>• None = 0</li> <li>• 5ms = 1</li> <li>• 20ms = 2</li> </ul>

---

## 3GPP2-Fwd-Dcch-Mux-Option

This attribute specifies Forward DCCH Mux option.

<b>Type</b>	26
<b>Vendor ID</b>	5535
<b>VSA Type</b>	84
<b>Length</b>	4

## ■ Attributes

**Value**

Unsigned integer

## 3GPP2-Fwd-Dcch-Rc

This attribute specifies Radio Configuration of the Forward Packet Data Channel.

**Type**

26

**Vendor ID**

5535

**VSA Type**

86

**Length**

4

**Value**

Unsigned integer

## 3GPP2-Fwd-Pdch-Rc

This attribute specifies Radio Configuration of the Forward Packet Data Channel.

**Type**

26

**Vendor ID**

5535

**VSA Type**

83

**Length**

4

**Value**

Unsigned integer

## 3GPP2-GMT-Timezone-Offset

GMT-Time-Zone-Offset is 4-octet string that is interpreted as a 4-byte signed integer that indicates the current offset in seconds from GMT at the visited carrier's PDSN. The offset should be adjusted to reflect standard time or daylight saving time.

**Type**

26

**Vendor ID**

5535

**VSA Type**

143

**Length**

4

**Value**

Integer

---

## 3GPP2-Granted-QoS

This attribute displays the 3GPP2-Granted-QoS-Parameter.

**Type**

26

**Vendor ID**

5535

**VSA Type**

132

**Value**

Contains the following subattributes:

---

### Direction

This attribute specifies the Granted QoS parameters received from the RAN for the flow identified by direction.

**Type**

1

**Length**

2

**Value**

Enumerated integer. Supported values are:

- Forward = 0
- Reverse = 1
- Both = 2

---

### Flow-Id

This attribute specifies the Granted QoS parameters received from the RAN for the flow identified by FLOW\_ID.

**Type**

2

**Length**

2

**Value**

Unsigned integer

---

## Attribute-Set-Id

This attribute specifies the Granted QoS parameters received from the RAN for flow verbose or non-verbose.

**Type**

3

**Length**

2

**Value**

Unsigned integer

---

## Flow-Profile-Id

This attribute specifies the Granted QoS parameters received from the RAN for the flow profile ID.

**Type**

4

**Length**

2

**Value**

Unsigned integer

---

## Traffic-Class

This attribute specifies the Granted QoS parameters received from the RAN for the flow traffic class.

**Type**

5

**Length**

2

**Value**

Enumerated integer. Supported values are:

- Unknown = 0
- Conversational = 1
- Streaming = 2
- Interactive = 3
- Background = 4

---

## Peak-Rate

This attribute specifies the Granted QoS parameters received from the RAN for the flow Peak Rate.

**Type**

6

**Length**

2

**Value**

Unsigned integer

---

**Bucket-Rate**

This attribute specifies the Granted QoS parameters received from the RAN for the flow Bucket Rate.

**Type**

7

**Length**

2

**Value**

Unsigned integer

---

**Token-Rate**

This attribute specifies the Granted QoS parameters received from the RAN for the flow Token Rate.

**Type**

8

**Length**

2

**Value**

Unsigned integer

---

**Max-Latency**

This attribute specifies the Granted QoS parameters received from the RAN for the flow Max Latency.

**Type**

9

**Length**

2

**Value**

Unsigned integer

---

**Max-IP-Packet-Loss-Rate**

This attribute specifies the Granted QoS parameters received from the RAN for the flow Packet Loss Rate.

**Type**

10

**Length**

2

**Value**

Unsigned integer

---

## Packet-Size

This attribute specifies the Granted QoS parameters received from the RAN for the flow Packet Size.

**Type**

11

**Length**

2

**Value**

Unsigned integer

---

## Delay-Var-Sensitive

This attribute specifies the Granted QoS parameters received from the RAN for the flow Delay Var Sensitive.

**Type**

12

**Length**

2

**Value**

Enumerated integer. Supported values are:

- Not-Specified = 0
- Sensitive = 1

---

## 3GPP2-IKE-Secret

This attribute contains the FA/HA shared secret for the IKE protocol. This attribute is salt-encrypted.

**Type**

26

**Vendor ID**

5535

**VSA Type**

3

**Length**

1-247

**Value**

Opaque value

---

## 3GPP2-IKE-Secret-Request

This attribute indicates if the IKE secret for the FA/HA pair is to be returned for the subscriber.

**Type**

26

<b>Vendor ID</b>	5535
<b>VSA Type</b>	1
<b>Length</b>	4
<b>Value</b>	Enumerated integer. Supported values are: <ul style="list-style-type: none"> <li>• No = 0</li> <li>• Yes = 1</li> </ul>

---

## 3GPP2-IKE-Secret-Unencrypted

IKE Secret key from RADIUS server in Access Accept message

<b>Type</b>	26
<b>Vendor ID</b>	5535
<b>VSA Type</b>	3
<b>Length</b>	1–247
<b>Value</b>	Opaque value

---

## 3GPP2-IMSI

This is the calling Station-ID attribute. IMSI value of the mobile is being filled in. This is sent when Custom11 dictionary is selected.

<b>Type</b>	26
<b>Vendor ID</b>	5535
<b>VSA Type</b>	1
<b>Length</b>	1–253
<b>Value</b>	Opaque value

**■ Attributes**

---

## 3GPP2-Interconnect-IP

This attribute is currently not supported.

---

## 3GPP2-Interconnect-QOS

This attribute is currently not supported.

---

## 3GPP2-Inter-User-Priority

This attribute displays the 3GPP2-Inter-User-Priority.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

5535

**VSA Type**

139

**Length**

4

**Value**

Unsigned integer

---

## 3GPP2-IP-QOS

This attribute defines the differentiated Services code points associated with the user data.

**Type**

26

**Vendor ID**

5535

**VSA Type**

36

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Best-Effort = 0
- CS1 = 8
- AF11 = 10
- AF12 = 12

- AF13 = 14
- CS2 = 16
- AF21 = 18
- AF22 = 20
- AF23 = 22
- CS3 = 24
- AF31 = 26
- AF32 = 28
- AF33 = 30
- CS4 = 32
- AF41 = 34
- AF42 = 36
- AF43 = 38
- CS5 = 40
- EF = 46
- CS6 = 48
- CS7 = 56

## 3GPP2-IP-Services-Authorized

This attribute specifies the type of IP services (IPv4/CMIPv4/IPv6/CMIPv6/PMIPv4/PMIPv6, etc.) authorized.

**Type**

26

**Vendor ID**

5535

**VSA Type**

185

**Length**

4

**Value**

In 11.0 and earlier releases: Unsigned integer

In 12.0 and later releases: Enumerated integer. Supported values are:

- SIP4 = 1
- SIP6 = 2
- MIP4 = 4
- MIP6 = 8
- IP4\_PMIP4 = 16
- IP6\_PMIP4 = 32

## ■ Attributes

- IP4\_PMIP6 = 64
- IP6\_PMIP6 = 128

---

## 3GPP2-IP-Technology

This attribute identifies whether we are using Simple IP, Mobile IP, or another technology.

**Type**

26

**Vendor ID**

5535

**VSA Type**

22

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Simple IP = 1
- Mobile IP = 2

---

## 3GPP2-IP-Services-Authorized

This attribute specifies the type of IP services (IPv4/CMIPv4/IPv6/CMIPv6/PMIPv4/PMIPv6..etc) authorized.

**Type**

26

**Vendor ID**

5535

**VSA Type**

185

**Length**

4

**Value**

Unsigned integer

---

## 3GPP2-KeyID

This attribute contains the opaque IKE Key Identifier for the FA/HA shared IKE secret. The first eight bytes is the network-order FA IP address in hexadecimal characters. The next eight bytes is the network-order HA IP address in hexadecimal characters. The final four bytes is a timestamp in network order, indicating when the key was created, and is the number of seconds since January 1, 1970, UTC.

**Type**

26

<b>Vendor ID</b>	5535
<b>VSA Type</b>	8
<b>Length</b>	20
<b>Value</b>	Opaque value

---

## 3GPP2-Last-Activity

This attribute contains timestamp of the last user activity. This attribute is same as the **3GPP2-Last-User-Activity-Time** standard attribute.

<b>Type</b>	26
<b>Vendor ID</b>	5535
<b>VSA Type</b>	80
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## 3GPP2-Max-Auth-Aggr-Bw-BET

This attribute contains the maximum authorized aggregate bandwidth for Best Effort Traffic.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

<b>Type</b>	26
<b>Vendor ID</b>	5535
<b>VSA Type</b>	130
<b>Length</b>	4
<b>Value</b>	Unsigned integer

## ■ Attributes

---

## 3GPP2-Max-Per-Fl-Pri-ForTheUser

The maximum per flow priority for the user.

**Type**

26

**Vendor ID**

5535

**VSA Type**

133

**Length**

4

**Value**

Unsigned integer

---

## 3GPP2-MEID

Mobile Equipment Identifier (MEID) uniquely identifies the mobile equipment.

**Type**

26

**Vendor ID**

5535

**VSA Type**

116

**Length**

0–14

**Value**

Opaque value

---

## 3GPP2-MIP-HA-Address

The IP address of the MIP Home Agent.

**Type**

26

**Vendor ID**

5535

**VSA Type**

7

**Length**

4

**Value**

IPv4 address

## 3GPP2-MIP-Lifetime

This VSA should be included in the RADIUS Access-Request message from the HA to the Home RADIUS/PPS if the HA is PrePaid capable. It may be included in the RADIUS Access-Accept message from the Home RADIUS/PPS to HA, in which case, the HA should include the received value in the MIP RRP sent to the PDSN.

**Type**

26

**Vendor ID**

5535

**VSA Type**

92

**Length**

Variable, greater than 8

**Value**

Contains the following two subattributes:

### RRQ-Lifetime

Should be included in the initial RADIUS Access-Request message and subsequent on-line RADIUS Access-Request if duration based PrePaid is provided for the session. It contains the MIP RRQ integer value lifetime received in the MIP RRQ message. In the RADIUS Access-Accept message, it contains the MIP RRQ integer value lifetime that should be used in the MIP RRP.

**Type**

1

**Length**

4

**Value**

Unsigned integer

### Used-Lifetime

Should be included in the RADIUS Access-Request message at re-registration and updated RRQ (new CoA) if duration based PrePaid is provided for the session, it contains the used MIP RRQ lifetime value from an existing MIP session with the same NAI and Home Address.

**Type**

1

**Length**

4

**Value**

Unsigned integer

## 3GPP2-MIP-Rev-Tunnel-Required

Indicates to the PDSN if MIP Reverse Tunneling is required.

## ■ Attributes

<b>Type</b>	26
<b>Vendor ID</b>	5535
<b>VSA Type</b>	4
<b>Length</b>	4
<b>Value</b>	<p>Enumerated integer. Supported values are:</p> <ul style="list-style-type: none"> <li>• NotRequired = 0</li> <li>• Required = 1</li> </ul>

---

## 3GPP2-MIP-Sig-Octet-Count-In

The total number of octets in registration requests and solicitations sent by the mobile.

<b>Type</b>	26
<b>Vendor ID</b>	5535
<b>VSA Type</b>	46
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## 3GPP2-MIP-Sig-Octet-Count-Out

The total number of octets in registration replies and agent advertisements, sent to the mobile.

<b>Type</b>	26
<b>Vendor ID</b>	5535
<b>VSA Type</b>	47
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## 3GPP2-MIP6-Authenticator

The MN-AAA authenticator obtained from the MN-AAA authentication mobility option in the BU.

**Type**

26

**Vendor ID**

5535

**VSA Type**

134

**Length**

12

**Value**

Opaque value

---

## 3GPP2-MIP6-CoA

MIPv6 CoA received in binding update.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

5535

**VSA Type**

119

**Length**

16

**Value**

Opaque value

---

## 3GPP2-MIP6-HA

MIPv6 Home Agent address received in binding update.

**Type**

26

**Vendor ID**

5535

**VSA Type**

118

**Length**

16

**Value**

## ■ Attributes

Opaque value

## 3GPP2-MIP6-HoA

MIPv6 HoA received in binding update.

**Type**

26

**Vendor ID**

5535

**VSA Type**

141

**Length**

16

**Value**

Opaque value

## 3GPP2-MIP6-HoA-Not-Authorized

Value of 1 indicates to the HA that the HoA is not authorized to be used by HA.

**Type**

26

**Vendor ID**

5535

**VSA Type**

120

**Length**

4

**Value**

Enumerated integer. Supported value is:

- UnAuthorized = 1

## 3GPP2-MIP6-Home-Address

Carries the assigned Home Address during MIP6 bootstrapping.

**Type**

26

**Vendor ID**

5535

**VSA Type**

129

**Length**

18

**Value**

Opaque value

## 3GPP2-MIP6-Home-Agent

Carries the assigned MIPv6 Home Agent address received during MIPv6 bootstrapping.

**Type**

26

**Vendor ID**

5535

**VSA Type**

140

**Length**

18

**Value**

Opaque value

## 3GPP2-MIP6-Home-Link-Prefix

Carries the assigned Home Link Prefix during MIP6 bootstrapping.

**Type**

26

**Vendor ID**

5535

**VSA Type**

128

**Length**

2–18

**Value**

Opaque value

## 3GPP2-MIP6-MAC-Mobility-Data

The hashed Mobility Data from the HA to the Home RADIUS server so that the Home RADIUS server can validate the MN-AAA authenticator.

**Type**

26

**Vendor ID**

5535

**VSA Type**

## ■ Attributes

138

**Length**

20

**Value**

Opaque value

## 3GPP2-MIP6-Mesg-ID

Value of Message ID from Mobility message replay protection option in Binding Update.

**Type**

26

**Vendor ID**

5535

**VSA Type**

123

**Length**

8

**Value**

Opaque value

## 3GPP2-MIP6-Session-Key

This VSA carries the Integrity Key (IK) in its encrypted form, from the Home RADIUS server to the HA.

**Type**

26

**Vendor ID**

5535

**VSA Type**

121

**Length**

16–64

**Value**

Opaque value

## 3GPP2-MN-AAA-Removal-Indication

This attribute, when set to “Not Required”, indicates that the system, when acting as a Mobile-IP Foreign Agent, should remove the MN-FA challenge and the MN-AAA Authentication Extensions, when present, from the RRQ before relaying the RRQ to the Mobile-IP Home Agent.

**Vendor ID**

26

**VSA Type**

5535

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Allowed = 0
- Not-Required = 1

## 3GPP2-MN-HA-Shared-Key

A shared key for MN-HA authentication. The MN-HA shared key is encrypted using a method based on MD5.

**Type**

26

**Vendor ID**

5535

**VSA Type**

58

**Length**

1–251

**Value**

Opaque value

## 3GPP2-MN-HA-Shared-Key-No-Enc

This attribute contains the MN-HA shared key in plain format.

**Type**

26

**Vendor ID**

5535

**VSA Type**

58

**Length**

1–251

**Value**

Opaque value

## 3GPP2-MN-HA-SPI

The SPI for the MN-HA authentication shared key.

**Type**

## ■ Attributes

26

**Vendor ID**  
5535**VSA Type**  
57**Length**  
4**Value**  
Unsigned integer

## 3GPP2-Mobile-Term-Orig-Ind

Tells whether the call is mobile originated (Call initiated from mobile side) or mobile terminated (Call initiated from external towards mobile).

**Type**  
26**Vendor ID**  
5535**VSA Type**  
45**Length**  
1**Value**  
Enumerated integer. Supported values are:

- Mobile-Originated = 0
- Mobile-Terminated = 1

## 3GPP2-Number-Active-Transitions

This attribute counts the total number of non-active to active transitions by the user.

**Type**  
26**Vendor ID**  
5535**VSA Type**  
30**Length**  
4**Value**  
Unsigned integer

---

## 3GPP2-Num-Bytes-Received-Total

This attribute counts all bytes received in the reverse direction by the HDLC layer in the PDSN.

**Type** 26  
**Vendor ID** 5535  
**VSA Type** 43  
**Length** 4  
**Value** Unsigned integer

---

## 3GPP2-Num-SDB-Input

This attribute counts the total number of Short Data Burst transactions to the user.

**Type** 26  
**Vendor ID** 5535  
**VSA Type** 33  
**Length** 4  
**Value** Unsigned integer

---

## 3GPP2-Num-SDB-Output

This attribute counts the total number of Short Data Burst transactions from the user.

**Type** 26  
**Vendor ID** 5535  
**VSA Type** 34  
**Length** 4  
**Value** Unsigned integer

## ■ Attributes

---

## 3GPP2-PMIP-Capability

This attribute specifies the AGW's PMIP capability.

**Type**

26

**Vendor ID**

5535

**VSA Type**

193

**Length**

4

**Value**

Enumerated integer. Supported values are:

- PMIPv4\_ONLY = 1
- PMIPv6\_ONLY = 2
- PMIPv4\_PMIPv6 = 3

---

## 3GPP2-PMIP-NAI

This attribute specifies the PMIP NAI provided by AAA.

**Type**

26

**Vendor ID**

5535

**VSA Type**

192

**Length**

1-128

**Value**

Opaque value

---

## 3GPP2-PMIP-IPv4Session-Info

This attribute specifies PMIP information for IPv4 session.

**Type**

26

**Vendor ID**

5535

**VSA Type**

194

**Length**

0–160

**Value**

Contains the following subattributes:

---

### VAAA-IPv4Session-HA-Addr

An IPv4 address or IPv6 Address of the local HA assigned by the AGW/VAAA for AT's IPv4 Address assignment.

**Type**

1

**Length**

0–16

**Value**

Opaque value

---

### HAAA-IPv4Session-HA-Addr

An IPv4 address or IPv6 Address of the home or local HA assigned by the HAAA for AT's IPv4 Address assignment.

**Type**

2

**Length**

0–16

**Value**

Opaque value

---

### PMN-HA-KEY

256 bits value of network PMIP MN-HA key.

**Type**

3

**Length**

0–32

**Value**

Opaque value

---

### PMN-HA-SPI

32 bits value of network PMIP MN-HA SPI value.

**Type**

4

**Length**

4

**Value**

**■ Attributes**

Unsigned integer

---

### VAAA-IPv4Session-LMA-Addr

An IPv4 address or IPv6 Address of the local LMA assigned by the AGW/VAAA for AT's IPv4 Address assignment

**Type**

5

**Length**

0–16

**Value**

Opaque value

---

### HAAA-IPv4Session-LMA-Addr

An IPv4 address or IPv6 Address of the home or local LMA assigned by the HAAA for AT's IPv4 Address assignment.

**Type**

6

**Length**

0–16

**Value**

Opaque value

---

## 3GPP2-PMIP-IPv6Session-Info

This attribute specifies the PMIP information for IPv6 session.

**Type**

26

**Vendor ID**

5535

**VSA Type**

195

**Length**

0–160

**Value**

Contains the following subattributes:

---

### VAAA-IPv6Session-HA-Addr

**Type**

1

**Length**

0–16

---

Value
Opaque value

---

### HAAA-IPv6Session-HA-Addr

Type
2
Length
0–16

**Value**  
Opaque value

---

### PMN-HA-KEY

Type
3
Length
0–32

**Value**  
Opaque value

---

### PMN-HA-SPI

Type
4
Length
4

**Value**  
Unsigned integer

---

### VAAA-IPv6Session-LMA-Addr

An IPv4 address or IPv6 Address of the local LMA assigned by the AGW/VAAA for AT's IPv6 Address assignment.

Type
5
Length
0–16

**Value**  
Opaque value

---

### HAAA-IPv6Session-LMA-Addr

An IPv4 address or IPv6 Address of the home or local LMA assigned by the HAAA for AT's IPv6 Address assignment.

<b>Type</b>	6
<b>Length</b>	0–16
<b>Value</b>	Opaque value

---

## 3GPP2-Pre-Paid-Accounting-Quota

This attribute specifies the characteristics for PrePaid accounting of the volume and/or duration of a packet data session. It should be present in all on-line RADIUS Access-Request and on-line RADIUS Access-Accept messages and may be included in other RADIUS Access-Accept messages. Non-used Sub-Types by the PPC and PPS should be omitted.

<b>Type</b>	26
<b>Vendor ID</b>	5535
<b>VSA Type</b>	90
<b>Length</b>	Variable, greater than 8.
<b>Value</b>	Contains the following nine subattributes:

---

### Quota-Identifier

The Quota-IDentifier Sub-Type is generated by the PrePaid server at allocation of a Volume and/or Duration Quota. The on-line quota update RADIUS Access-Request message sent from the PPC to the PPS should include a previously received Quota-Identifier.

<b>Type</b>	1
<b>Length</b>	8
<b>Value</b>	Unsigned integer

---

### Volume-Quota

The optional Volume-Quota Sub-Type is only present if Volume Based charging is used. In RADIUS Access-Accept message (PPS to PPC direction), it indicates the Volume (in octets) allocated for the session by the PrePaid server. In on-line RADIUS Access-Request message (PPC to PPS direction), it indicates the total used volume (in octets) for both forward and reverse traffic applicable to PrePaid accounting 13. If a Tariff Switch condition was reached during the session, this Sub-Type contains the complete (before and after) volume used, while the VolumeUsedAfterTariffSwitch attribute contains the volume used after the tariff switch condition.

<b>Type</b>
-------------

2

**Length**

4

**Value**

Unsigned integer

## Volume-Quota-Overflow

The optional Volume-Quota-Overflow Sub-Type is used to indicate how many times the VolumeQuota counter has wrapped around  $2^{32}$  over the course of the service being provided.

**Type**

3

**Length**

2

**Value**

Unsigned integer

## Volume-Threshold

The Volume-Threshold Sub-Type should always be present if VolumeQuota is present in a RADIUS Access-Accept message (PPS to PPC direction). It is generated by the PrePaid server and indicates the volume (in octets) that should be used before requesting quota update. This threshold should not be larger than the VolumeQuota.

**Type**

4

**Length**

4

**Value**

Unsigned integer

## Volume-Threshold-Overflow

The optional Volume-Threshold-Overflow Sub-Type is used to indicate how many times the VolumeThreshold counter has wrapped around  $2^{32}$  over the course of the service being provided.

**Type**

5

**Length**

2

**Value**

Unsigned integer

## Duration-Quota

The optional Duration-Quota Sub-Type is only present if Duration Based charging is used. In RADIUS Access-Accept message (PPS to PPC direction), it indicates the Duration (in seconds) allocated for the

session by the PrePaid server. In on-line RADIUS Access-Accept message (PPC to PPS direction), it indicates the total Duration (in seconds) since the start of the accounting session related to the QuotaID.

**Type**

6

**Length**

4

**Value**

Unsigned integer

**Duration-Threshold**

The Duration-Threshold Sub-Type should always be present if DurationQuota is present in a RADIUS Access-Accept message (PPS to PPC direction). It represents the duration (in seconds) that should be used by the session before requesting quota update. This threshold should not be larger than the DurationQuota and should always be sent with the DurationQuota.

**Type**

7

**Length**

4

**Value**

Unsigned integer

**Update-Reason**

The Update-Reason Sub-Type should be present in the on-line RADIUS Access-Request message (PPC to PPS direction). It indicates the reason for initiating the on-line quota update operation. Update reasons 4, 5, 6, 7 and 8 indicate that the associated resources are released at the client side, and therefore the PPS should not allocate a new quota in the RADIUS Access-Accept message.

**Type**

8

**Length**

2

**Value**

Enumerated integer. Supported values are:

- Pre-Initialization = 1
- Initial-Request = 2
- Threshold-Reached = 3
- Quota-Reached = 4
- Remote-Forced-Disconnect = 5
- Client-Service-Termination = 6
- Main-SI-Released = 7
- Service-Instance-Not-Established = 8
- Tariff-Switch-Update = 9

- Incorrect-Quota-Type-Received = 10
- Poorly-Formed-Quota-Attribute = 11

---

## Pre-Paid-Server

The optional, multi-value Pre-Paid-Server indicates the address of the serving PrePaid System. If present, the Home RADIUS server uses this address to route the message to the serving PrePaid Server. The attribute may be sent by the Home RADIUS server. If present in the incoming RADIUS Access-Accept message, the PDSN should send this attribute back without modifying it in the subsequent RADIUS Access-Request message, except for the first one. If multiple values are present, the PDSN should not change the order of the attributes.

**Type**

9

**Length**

4

**Value**

IPv4 address

---

## 3GPP2-Pre-Paid-Acct-Capability

This attribute specifies the capability for PrePaid accounting for a packet data session. It contains the possible capabilities of the PrePaid client and the selected (by the PrePaid server) capability for the session. The absence of this VSA indicates that the client is not capable of PrePaid Accounting and the session should not use PrePaid accounting.

**Type**

26

**Vendor ID**

5535

**VSA Type**

91

**Length**

Variable, greater than 8

**Value**

Contains the following two subattributes:

---

## Available-In-Client

The optional Available-In-Client Sub-Type, generated by the PrePaid client, indicates the PrePaid Accounting capabilities of the client in the PDSN or HA and should be bitmap encoded.

**Type**

1

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Supported\_None = 0
- Supported\_Volume = 1 — PrePaid Accounting for Volume supported
- Supported\_Duration = 2 — PrePaid Accounting for Duration supported
- Supported\_Volume\_And\_Duration = 3 — PrePaid Accounting for Volume and Duration supported (non concurrently)

---

## Selected-For-Session

The optional Selected-For-Session Sub-Type, generated by the PrePaid server, indicates the PrePaid Accounting capability to be used for a given session.

**Type**

2

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Usage\_None = 0 — PrePaid Accounting not used
- Usage\_Volume = 1 — Usage of PrePaid Accounting for Volume (only possible if the AvailableInClient supports PrePaid Accounting for Volume).
- Usage\_Duration = 2 — Usage of PrePaid Accounting for Duration (only possible if the AvailableInClient supports PrePaid Accounting for Duration).
- Usage\_Volume\_And\_Duration = 3 — Usage of PrePaid Accounting for Volume and Duration (non concurrent) (only possible if the AvailableInClient supports PrePaid Accounting for Volume and duration).

---

## 3GPP2-Pre-Paid-TariffSwitch

**Type**

26

**Vendor ID**

5535

**VSA Type**

98

**Length**

Compound

**Value**

Contains the following subattributes:

---

## Quota-Identifier

Quota-Identifier

**Type**

1

**Length**

4

**Value**

Unsigned integer

---

**Volume-Used-After-Tariff-Switch**

Volume Quota used after Tariff Switch happened.

**Type**

2

**Length**

4

**Value**

Unsigned integer

---

**Volume-Used-ATS-Overflow**

Indicates how many times the VUATS counter has wrapped around  $2^{32}$  over the course of the service being provided.

**Type**

3

**Length**

2

**Value**

Unsigned integer

---

**Tariff-Switch-Interval**

Indicates Tariff Switch Interval in seconds.

**Type**

4

**Length**

4

**Value**

Unsigned integer

---

**Time-Interval-After-Tariff-Switch-Update**

Duration after TSI where an on-line RADIUS Access-Request is sent by PrePaid client to report VUATS before the next TS condition is triggered.

**Type**

5

**Length**

4

Value
Unsigned integer

---

## 3GPP2-QoS-Service-Opt-Profile

The attribute specifies the unauthorized packet data service options, the maximum number of simultaneous service instances of the given service option number and the total maximum number of simultaneous service instances.

<b>Type</b>	26
<b>Vendor ID</b>	5535
<b>VSA Type</b>	74
<b>Length</b>	8-247
<b>Value</b>	Opaque value

---

## 3GPP2-Release-Indicator

This attribute specifies reasons for sending a stop record. The enumeration of this attribute conforms to IS-835-1.

<b>Type</b>	26
<b>Vendor ID</b>	5535
<b>VSA Type</b>	24
<b>Length</b>	4
<b>Value</b>	<p>Enumerated integer. Supported values are:</p> <ul style="list-style-type: none"> <li>• Unknown = 0</li> <li>• PPP-Timeout = 1</li> <li>• Handoff = 2</li> <li>• PPP-Termination = 3</li> <li>• Mobile-IP-Registration-Failure = 4</li> <li>• Abnormal-Terminations = 5</li> <li>• Termination-Due-to-Resource-Mgmt = 6</li> <li>• Service-Instance-Released = 7</li> <li>• VolumeQuota-Reached = 8</li> </ul>

- DurationQuota-Reached = 9
- Incompatible-Prepaid = 10
- Airlink-Parameter-Change = 11
- TOD-Timer-Expiry = 12
- Active-To-Dormant = 13
- Flow-Deactivated = 15
- PPP-Renegotiation = 1001
- MIP-Lifetime-Expired = 1002
- A11-Lifetime-Expired = 1003
- MIP-Remote-Dereg = 1004
- Tarrif-Boundary = 1006
- PPP-Renegotiation-Handoff = 1007
- MIP-Registration-Revocation = 1008

---

## 3GPP2-Release-Indicator-custom9

3GPP2 Release Indicator for custom9, reason/cause for session release.

**Type**

26

**Vendor ID**

5535

**VSA Type**

24

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Unknown = 0
- PPP-Timeout = 1
- Handoff = 2
- PPP-Termination = 3
- Mobile-IP-Registration-Failure = 4
- PPP-Renegotiation = 5
- MIP-Registration-Revocation = 6
- VolumeQuota-Reached = 8
- DurationQuota-Reached = 9
- Incompatible-Prepaid = 10

---

## 3GPP2-Release-Indicator-Old

3GPP2 old Standard Release Indicator, reason/cause for session release.

**Type**

26

**Vendor ID**

5535

**VSA Type**

24

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Unknown = 0
- PPP-Timeout = 1
- Handoff = 2
- PPP-Protocol-Failure = 3
- PPP-Abnormal-Release = 4
- PPP-Termination = 5
- Mobile-IP-Registration-Failure = 6
- Active-To-Dormant = 7

---

## 3GPP2-Remote-Addr-Table-Index

This attribute contains the Remote Address Table Index used to generate remote address accounting records. Supported range is 1–65535. Only one 3GPP2-Remote-Addr-Table-Index can be associated with a session.

**Type**

26

**Vendor ID**

5535

**VSA Type**

71

**Length**

4

**Value**

Contains the following two subattributes:

---

### Table-Index

Table-Index

**Type**

<b>Length</b>	1
<b>Type</b>	2
<b>Value</b>	Unsigned integer

---

## Qualifier

<b>Qualifier</b>	2
<b>Type</b>	2
<b>Length</b>	2
<b>Value</b>	Enumerated integer. Supported values are: <ul style="list-style-type: none"> <li>• Exempt-From-Prepaid = 1</li> <li>• Summarize-Octet-Count = 2</li> <li>• Both = 3</li> </ul>

---

## 3GPP2-Remote-IPv4-Address

This attribute allows the HA or PDSN to identify any IP address to be used for remote address-based accounting for the user. Up to 20 instances of the attribute are supported in the access response.

<b>Type</b>	26
<b>Vendor ID</b>	5535
<b>VSA Type</b>	59
<b>Length</b>	12
<b>Value</b>	Contains the following three subattributes:

---

## Address

This attribute contains an IPv4 address to be used for remote address based accounting for the user. The address is used in conjunction with the **Remote-Address-Mask** subattribute to define the range of addresses to be monitored.

<b>Type</b>	1
<b>Length</b>	4

Value
IPv4 address

---

## Netmask

This attribute contains an IPv4 address mask that defines the set of remote addresses to be used for remote address based accounting.

Type
2
Length
4
Value
IPv4 address

---

## Qualifier

Qualifier
Type
3
Length
2
Value
Enumerated integer. Supported values are:
<ul style="list-style-type: none"> <li>• Exempt-From-Prepaid = 1</li> <li>• Summarize-Octet-Count = 2</li> <li>• Both = 3</li> </ul>

---

## 3GPP2-Remote-IPv4-Addr-Octets

This attribute allows the HA or PDSN to identify any IP address to be used for remote address based accounting for the user. Up to 10 instances of the attribute are supported.

Type
26
Vendor ID
5535
VSA Type
72
Length
26
Value
Contains the following subattributes:

---

## Address

This attribute contains an IPv4 address to be used for remote address based accounting for the user. The address is used in conjunction with the Netmask subattribute to define the range of addresses to be monitored.

**Type**

1

**Length**

4

**Value**

IPv4 address

---

## Netmask

This attribute contains an IPv4 address mask that defines the set of remote addresses to be used for remote address based accounting.

**Type**

2

**Length**

4

**Value**

An IP Netmask specified in IP address format.

---

## Octets-Out

Indicates how many bytes have been sent to the remote address specification (corresponds to forward traffic direction).

**Type**

3

**Length**

4

**Value**

Unsigned integer

---

## Octets-In

Indicates how many bytes have been received from the remote address specification (corresponds to reverse traffic direction).

**Type**

4

**Length**

4

**Value**

Unsigned integer

---

## Table-Index

Table-Index	
<b>Type</b>	5
<b>Length</b>	2
<b>Value</b>	Unsigned integer

---

## Octets-Overflow-Out

Indicates how many times the forward octet overflow counter has wrapped around  $2^{32}$  over the course of the service being provided.

Type	6
Length	2
Value	Unsigned integer

---

## Octets-Overflow-In

Indicates how many times the reverse octets overflow counter has wrapped around  $2^{32}$  over the course of the service being provided.

Type	7
Length	2
Value	Unsigned integer

---

## 3GPP2-Rev-Dcch-Mux-Option

This attribute specifies Reverse DCCH Mux option.

<b>Type</b>	26
<b>Vendor ID</b>	5535
<b>VSA Type</b>	85
<b>Length</b>	4

**Value**

Unsigned integer

---

## 3GPP2-Rev-Dcch-Rc

This attribute specifies the Radio Configuration of the Reverse Packet Data Channel.

**Type**

26

**Vendor ID**

5535

**VSA Type**

87

**Length**

4

**Value**

Unsigned integer

---

## 3GPP2-Reverse-Fundamental-Rate

As defined in “Wireless IP Network Standard - 3GPP2.P.S0001-A-1[4]”.

**Type**

26

**Vendor ID**

5535

**VSA Type**

15

**Length**

4

**Value**

Unsigned integer

---

## 3GPP2-Reverse-Fundamental-RC

The format and structure of the RADIUS channel in the reverse direction. A set of forward transmission formats that are characterized by data rates, modulation characterized, and spreading rates.

**Type**

26

**Vendor ID**

5535

**VSA Type**

21

**■ Attributes****Length**

4

**Value**

Unsigned integer

## 3GPP2-Reverse-Mux-Option

Forward direction multiplexer option.

**Type**

26

**Vendor ID**

5535

**VSA Type**

13

**Length**

4

**Value**

Unsigned integer

## 3GPP2-Reverse-Traffic-Type

Specifies the reverse traffic type.

**Type**

26

**Vendor ID**

5535

**VSA Type**

18

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Primary = 0
- Secondary = 1

## 3GPP2-Rev-Pdch-Rc

This attribute displays the 3GPP2-Rev-Pdch-Rc.

**Type**

26

**Vendor ID**

5535

**VSA Type**

114

**Length**

4

**Value**

Unsigned integer

---

## 3GPP2-RP-Session-ID

This represents the GRE key selected by the PCF that identifies the A10 traffic for a user session.

**Type**

26

**Vendor ID**

5535

**VSA Type**

41

**Length**

4

**Value**

Unsigned integer

---

## 3GPP2-Rsvp-Signal-In-Count

This attribute specifies the RSVP signaling octets sent by the MS.

**Type**

26

**Vendor ID**

5535

**VSA Type**

162

**Length**

4

**Value**

Unsigned integer

---

## 3GPP2-Rsvp-Signal-In-Packets

This attribute specifies the Number of RSVP signaling packets sent by the MS.

**Type**

26

**■ Attributes**

<b>Vendor ID</b>	5535
<b>VSA Type</b>	164
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## 3GPP2-Rsvp-Signal-Out-Count

This attribute specifies the RSVP signaling octets sent to the MS.

<b>Type</b>	26
<b>Vendor ID</b>	5535
<b>VSA Type</b>	163
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## 3GPP2-Rsvp-Signal-Out-Packets

This attribute specifies the Number of RSVP signaling packets sent to the MS.

<b>Type</b>	26
<b>Vendor ID</b>	5535
<b>VSA Type</b>	165
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## 3GPP2-S

This attribute contains the 'S' secret parameter used to make the IKE pre-shared secret.

**Type**

26

**Vendor ID**

5535

**VSA Type**

54

**Length**

1–247

**Value**

A binary string of the value of 'S'.

## 3GPP2-SDB-Input-Octets

This attribute counts the total number of octets sent to the user via Short Data Bursts.

**Type**

26

**Vendor ID**

5535

**VSA Type**

31

**Length**

4

**Value**

Unsigned integer

## 3GPP2-SDB-Output-Octets

This attribute counts the total number of octets sent by the user via Short Data Bursts.

**Type**

26

**Vendor ID**

5535

**VSA Type**

32

**Length**

4

**Value**

Unsigned integer

## 3GPP2-Security-Level

This attribute indicates the type of security that the home network mandates on the visited network.

## ■ Attributes

<b>Type</b>	26
<b>Vendor ID</b>	5535
<b>VSA Type</b>	2
<b>Length</b>	4
<b>Value</b>	<p>Enumerated integer. Supported values are:</p> <ul style="list-style-type: none"> <li>• IPSec = 3—IPSec for tunnels and registration messages</li> <li>• None = 4</li> </ul>

---

## 3GPP2-Service-Option

This attribute indicates the service option used for CDMA air interface.

<b>Type</b>	26
<b>Vendor ID</b>	5535
<b>VSA Type</b>	16
<b>Length</b>	4
<b>Value</b>	<p>Enumerated integer. Supported values are:</p> <ul style="list-style-type: none"> <li>• HSPD = 0x21</li> <li>• HRPD = 0x3b</li> <li>• LLAROHC = 0x3d</li> <li>• HRPD-AUX = 0x40</li> <li>• HRPD-AUX-IP = 0x43</li> <li>• eHRPD = 0x252</li> <li>• LTE = 0x253</li> <li>• UTRAN = 0x254</li> <li>• GERAN = 0x255</li> <li>• WIFI = 0x806c</li> </ul>

## 3GPP2-Service-Option-Profile

This attribute specifies the authorized packet data service options, the maximum number of simultaneous service instances of the given service option number (n), and the total maximum number of simultaneous service instances. This attribute may appear in a RADIUS Access-Accept message.

**Type**

26

**Vendor ID**

5535

**VSA Type**

74

**Length**

4

**Value**

Unsigned integer Supported values are:

- Maximum Service Instances total: The maximum number of service instances the user is allowed to establish regardless of the service option numbers. '1' represents one service instance, i.e., the main service instance. '0' is not an allowed value.
- Sub-Type (= 1): Sub-Type for service option length for service option attribute in octets (4 octets)Service Option n: Service Option number: Maximum Number of Service instances of service option n. Sub-Type 1 may be repeated, once for each authorized service option.

## 3GPP2-Service-Reference-ID

Specifies the reference ID of the service instance as received in the A11 Registration Request. If the service instance is the main service instance, the main SI Indicator Sub-Type should be included.

**Type**

26

**Vendor ID**

5535

**VSA Type**

94

**Length**

4

**Value**

Contains two subattributes:

### SR-ID

The SR\_ID value received in the A11 Registration-Request message.

**Type**

1

**Length**

## ■ Attributes

2

**Value**

Unsigned integer

**Main-SI-Indicator**

Only included for the main service instance.

**Type**

2

**Length**

2

**Value**

Enumerated integer. Supported value is:

- Main-SI = 1

**3GPP2-Serving-PCF**

IP address of the serving PCF.

**Type**

26

**Vendor ID**

5535

**VSA Type**

9

**Length**

4

**Value**

IPv4 address

**3GPP2-Session-Continue**

This attribute when set to True means it is not the end of a session, and an Accounting Stop is immediately followed by an Account Start Record. False means end of a session.

**Type**

26

**Vendor ID**

5535

**VSA Type**

48

**Length**

4

**Value**

Enumerated integer. Supported values are:

- False = 0
- True = 1

---

## 3GPP2-Session-Term-Capability

This attribute should be included in a RADIUS Access-request message to the Home RADIUS server and should contain the value 3 to indicate that the PDSN and HA support both Dynamic authorization with RADIUS and Registration Revocation for Mobile Ipv4. The attribute should also be included in the RADIUS Access-Accept message and should contain the preferred resource management mechanism by the home network, which should be used for the session and may include values 1 to 3.

**Type**

26

**Vendor ID**

5535

**VSA Type**

88

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Only\_Dynamic\_Auth\_Extn\_to\_Radius = 0x00000001 = 1
- Only\_Reg\_Revocation\_in\_MIP = 0x00000002 = 2
- Both\_Dynamic\_Auth\_And\_Reg\_Revocation\_in\_MIP = 0x00000003 = 3

---

## 3GPP2-S-Key

This attribute contains the HA IKE key in encrypted format.

**Type**

26

**Vendor ID**

5535

**VSA Type**

54

**Length**

1–247

**Value**

Opaque value

## ■ Attributes

---

## 3GPP2-S-Lifetime

This attribute contains the lifetime of the 'S' secret parameter used to make the IKE pre-shared secret, indicating the time in seconds since January 1, 1970 00:00 UTC. Note that this is equivalent to the UNIX operating system expression of time.

**Type**

26

**Vendor ID**

5535

**VSA Type**

55

**Length**

4

**Value**

Unsigned integer

---

## 3GPP2-S-Request

This attribute indicates whether the HA requests a shared secret 'S'.

**Type**

26

**Vendor ID**

5535

**VSA Type**

55

**Length**

4

**Value**

Enumerated integer. Supported values are:

- No = 0
- Yes = 1 — 'S' secret requested for IKE

---

## 3GPP2-Subnet

This attribute specifies the Subnet information of the HRPD RAN.

**Type**

26

**Vendor ID**

5535

**VSA Type**

108

**Value**

Contains the following subattributes:

---

### Rev-A-Subnet

This attribute specifies the Subnet information of the HRPD RAN.

**Type**

1

**Length**

In StarOS 8.1 and earlier: 1-18; In StarOS 9.0 and later: 1-19

**Value**

Opaque value

---

### Rev-A-Sector-Id

This attribute specifies the Sector ID information of the HRPD RAN.

**Type**

2

**Length**

In StarOS 8.1 and earlier: 1-19; In StarOS 9.0 and later: 1-18

**Value**

Opaque value

---

## 3GPP2-S-Unencrypted

This attribute contains the HA IKE key in plain format.

**Type**

26

**Vendor ID**

5535

**VSA Type**

54

**Length**

1-247

**Value**

Opaque value

---

## 3GPP2-User-Zone

This attribute describes the Tiered Services user zone. The least significant 16 bits are the user zone ID, the next significant 15 bits are the user zone system ID, and the most significant bit is zero.

**Type**

26

## ■ Attributes

<b>Vendor ID</b>	5535
<b>VSA Type</b>	11
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## AAA-Session-ID

A unique per realm identifier assigned to WiMAX session by the Home network during network entry.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

<b>Type</b>	26
<b>Vendor ID</b>	24757
<b>VSA Type</b>	4
<b>Length</b>	1–246
<b>Value</b>	Opaque value

---

## Access-In-Subs

This attribute is used in a custom dictionary, and the VSA type is not standard. Opaque 1 byte value received in Access Accept. This will be included in accounting messages for this session.

<b>Type</b>	136
<b>Vendor ID</b>	5535 (Reusing the 3GPP2 VID in a non-standard way.)
<b>VSA Type</b>	224
<b>Length</b>	1
<b>Value</b>	Opaque value

---

## Acct-Authentic

This attribute is included in Accounting-Request packets to indicate how the session was authenticated (RADIUS or locally).

**Type**

45

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

4

**Value**

Enumerated integer. Supported values are:

- None = 0 — Authentication was not required for the session
- RADIUS = 1 — The session was authenticated via RADIUS
- Local = 2 — The session was authenticated locally
- Remote = 3
- Diameter = 4

---

## Acct-Delay-Time

This attribute indicates how many seconds the chassis has been trying to send this record for. The standard behavior is that this AVP will be visible in the Accounting Request message only if it has a non-zero value.

**Type**

41

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

4

**Value**

Unsigned integer

---

## Acct-Input-Gigawords

This attribute indicates how many times the Acct-Input-Octets attribute has wrapped within its 32-bit field length. In effect, the number of octets received is a 64-bit integer, with this attribute representing the high 32 bits, and the Acct-Input-Octets attribute representing the low 32 bits. This attribute is not included unless it has a non-zero value.

**Type**

52

## ■ Attributes

<b>Vendor ID</b>	N/A
<b>VSA Type</b>	N/A
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## Acct-Input-Octets

This attribute indicates how many octets have been received in the PPP session. Since the value field is 32 bits, it is possible that the number of octets will exceed the 32-bit field length. If this happens, this attribute will “wrap” back to 0. Each time the “wrap” occurs, the **Acct-Input-Gigawords** attribute will be incremented. In effect, the number of octets received is a 64-bit integer, with the **Acct-Input-Gigawords** attribute representing the high 32 bits, and this attribute representing the low 32 bits.



**Important:** RADIUS reports what is going through the air interface. For uplink traffic, it reports all packets including those dropped/filtered by ACS. For downlink traffic, it reports what is going to the MS after ACS filtering. When DCCA is enabled, packets may be dropped due to unavailability of quota. Therefore, for pre-paid calls, accounting attributes “Acct-Input-Octets” and “Acct-Output-Octets” will not match totals of “dataVolumeGPRSUplink” and “dataVolumeGPRSDownlink” respectively from generated eG-CDRs.

---

<b>Type</b>	42
<b>Vendor ID</b>	N/A
<b>VSA Type</b>	N/A
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## Acct-Input-Packets

This attribute indicates how many PPP packets have been received during the session.

<b>Type</b>	47
<b>Vendor ID</b>	N/A
<b>VSA Type</b>	N/A
<b>Length</b>	

4

**Value**

Unsigned integer

---

## Acct-Interim-Interval

This attribute indicates the time (in seconds) between updates to session counters (log file on RADIUS or AAA event log) during the session. Note that the setting for this attribute always takes precedence over interim interval settings configured on the system.



**Caution:** To avoid increasing network traffic unnecessarily and potentially reducing network and system performance, do not set this parameter to a value less than 50.

If this AVP is present in Access Accept message, the locally configured RADIUS accounting interim interval value in AAA group will be overridden. If there are no values configured in the RADIUS and AAA group the accounting interim is disabled.

**Type**

85

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

4

**Value**

Unsigned integer

---

## Acct-Multi-Session-Id

This attribute is a unique Accounting ID to make it easy to link together multiple related sessions in a log file. Each session linked together would have a unique **Acct-Session-Id** but the same **Acct-Multi-Session-Id**. It is strongly recommended that the **Acct-Multi-Session-Id** contain UTF-8 encoded characters.

**Type**

50

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

1-253

**Value**

String

## Acct-Output-Gigawords

This attribute indicates how many times the **Acct-Output-Octets** attribute has wrapped within its 32-bit field length. In effect, the number of octets received is a 64-bit integer, with this attribute representing the high 32 bits, and the **Acct-Output-Octets** attribute representing the low 32 bits. This attribute is not included unless it has a non-zero value.

**Type**

53

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

4

**Value**

Unsigned integer

## Acct-Output-Octets

This attribute indicates how many octets have been sent in the PPP session. Since the value field is 32 bits, it is possible that the number of octets will exceed the 32-bit field length. If this happens, this attribute will “wrap” back to 0. Each time the “wrap” occurs, the **Acct-Output-Gigawords** attribute will be incremented. In effect, the number of octets received is a 64-bit integer, with the **Acct-Output-Gigawords** attribute representing the high 32 bits, and this attribute representing the low 32 bits.



**Important:** RADIUS reports what is going through the air interface. For uplink traffic, it reports all packets including those dropped/filtered by ACS. For downlink traffic, it reports what is going to the MS after ACS filtering. When DCCA is enabled, packets may be dropped due to unavailability of quota. Therefore, for pre-paid calls, accounting attributes “Acct-Input-Octets” and “Acct-Output-Octets” will not match totals of “dataVolumeGPRSUplink” and “dataVolumeGPRSDownlink” respectively from generated eG-CDRs.

**Type**

43

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

4

**Value**

Unsigned integer

## Acct-Output-Packets

This attribute indicates how many PPP packets have been sent during the session.

<b>Type</b>	48
<b>Vendor ID</b>	N/A
<b>VSA Type</b>	N/A
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## Acct-Session-Id

This attribute is a session ID. Combined with the identification of the chassis (NAS-IP-Address or NAS-Identifier), this uniquely describes a session. For a given chassis, there will never be another session (even across boots) with this same session ID. The **Acct-Session-ID** AVP is sent on both Gx and Gy messages.

This attribute is also accepted in CoA request and response messages to be used in a currently active subscriber session.

<b>Type</b>	44
<b>Vendor ID</b>	N/A
<b>VSA Type</b>	N/A
<b>Length</b>	1–253
<b>Value</b>	String

---

## Acct-Session-Id-Long

This attribute contains long format account session ID. This is supported only for custom2 dictionary.

<b>Type</b>	44
<b>Vendor ID</b>	N/A
<b>VSA Type</b>	N/A
<b>Length</b>	1–253
<b>Value</b>	String

## Acct-Session-Time

This attribute indicates the duration of the session in seconds.

**Type**

46

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

4

**Value**

Integer

## Acct-Status-Type

This attribute indicates the event for the session.

**Type**

40

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Start = 1 — The session has started, or the service has been delivered
- Stop = 2 — The session has completed, or the user has released service
- Interim-Update = 3 — The session or service is still ongoing. Usage details are given in other RADIUS attributes.
- Accounting-On = 7 — The chassis sends this message to the RADIUS server upon boot.
- Accounting-Off = 8 — The chassis sends this message to the RADIUS server when it shuts down in a normal fashion.
- Tunnel-Start = 9
- Tunnel-Stop = 10
- Tunnel-Reject = 11
- Tunnel-Link-Start = 12
- Tunnel-Link-Stop = 13
- Tunnel-Link-Reject = 14

- Failed = 15

## Acct-Termination-Cause

This attribute indicates why the session was terminated.

This attribute is also accepted in CoA response message to be used in a currently active subscriber session.

**Type**

49

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

4

**Value**

Enumerated integer. Supported values are:

- User\_Request = 1 — The user requested termination
- Lost\_Carrier = 2
- Lost\_Service = 3 — The chassis session terminated abnormally
- Idle\_Timeout = 4 — The session idle timeout expired
- Session\_Timeout = 5 — The session timeout expired
- Admin\_Reset = 6 — The Service Provisioning system terminated the session
- Admin\_Reboot = 7 — The Service Provisioning system rebooted the chassis
- Port\_Error = 8 — PAC error, requiring the session to be terminated
- NAS\_Error = 9 — Error other than PAC error, requiring session to be terminated
- NAS\_Request = 10 — Session terminated for any other non error reason by PDSN
- NAS\_Reboot = 11 — The chassis rebooted abnormally.
- Port\_Unneeded = 12
- Port\_Preempted = 13 — Duplicate Home Address Requested. Call aborted.
- Port\_Suspended = 14 — PPP restart or RP-A11 disconnect without active Stop conditions
- Service\_Unavailable = 15 — The chassis could not provide the service requested
- Callback = 16
- User\_Error = 17 — A non-compliant PPP client required the chassis to terminate the session
- Host\_Request = 18 — Inter-PDSN handoff, Active->Dormant transition, PPP re-nego-tiation, Active Start Parameter change, Accounting Tariff Boundary
- Supplicant\_Restart = 19
- Reauthentication\_Failure = 20
- Port\_Reinitialized = 21
- Port\_Administratively\_Disabled = 22

## ■ Attributes

- Inter-PDSN-Handoff = 99 — Customer-specific implementation
- Long-Duration-Timeout = 1001
- Invalid-Source-Address = 1002
- Duplicate-IMSI = 1003
- Interim-Update = 1004
- Hotlining-Status-Change=1005

---

**BU-CoA-Ipv6**

The IPv6 address extracted from the Careof Address field in the BU and sent in Access Request from HA for WiMAX call.

**Type**

26

**Vendor ID**

24757

**VSA Type**

51

**Length**

16

**Value**

Opaque value

---

**Callback-Id**

This attribute contains the name of the place to be called, to be interpreted by NAS.

**Type**

20

**Length**

1-253

**Value**

Opaque value

---

**Called-Station-ID**

For PDSN, the value of this attribute is a single zero byte for custom6/7/8 dictionaries. For other dictionaries, this attribute will not be present for PDSN calls.

**Type**

30

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

1–253

**Value**

For GGSN, a UTF-8 encoded string identifying the target network. For PDSN, a single zero byte.

---

## Calling-Station-Id

This attribute indicates the Mobile Station Identifier in PDSN, and MSISDN in GGSN.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

31

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

1–15

**Value**

ASCII string

---

## Calling-Subscriber-Type

Opaque one byte value received from customer RADIUS server in access request. We need to retain this value and return it back in all future accounting messages. Used in custom dictionary.

**Type**

136

**Vendor ID**

5535 (Reusing the 3GPP2 VID in a non-standard way.)

**VSA Type**

218

**Length**

1

**Value**

The system does not interpret this value, it is only copied in accounting messages.

---

## CHAP-Challenge

This attribute contains the CHAP Challenge that was sent by the chassis to the other end of the PPP link, when CHAP authentication is being used.

**Type**

60

**■ Attributes**

<b>Vendor ID</b>	N/A
<b>VSA Type</b>	N/A
<b>Length</b>	1-253
<b>Value</b>	Opaque value

---

## CHAP-Password

This attribute contains the CHAP ID and the CHAP Response when CHAP authentication is used.

<b>Type</b>	3
<b>Vendor ID</b>	N/A
<b>VSA Type</b>	N/A
<b>Length</b>	17
<b>Value</b>	Bit string. First byte is the CHAP ID. Next 16 bytes is the CHAP Response.

---

## Charging-Id

Same as **3GPP-Charging-ID** standard attribute; non-standard behavior for use in custom dictionary.

<b>Type</b>	225
<b>Vendor ID</b>	N/A
<b>VSA Type</b>	N/A
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## Class

This attribute may be sent by the RADIUS server to the chassis in an Access-Accept packet. The chassis will include this attribute in all subsequent Accounting-Request messages sent to the RADIUS Accounting server for this user's session. This attribute is included to support the RADIUS protocol and should not be human-interpreted.

<b>Type</b>	25
<b>Vendor ID</b>	N/A
<b>VSA Type</b>	N/A
<b>Length</b>	1–253
<b>Value</b>	The format of the value is server-dependent. The chassis will interpret it as simply a bit string to be reflected in Accounting-Request messages.

---

## CUI

Chargeable User Identity is a unique temporary handle to the user responsible for paying bill. Set to NULL in Initial Access request and set to value sent by AAA in subsequent messages.

<b>Type</b>	89
<b>Vendor ID</b>	N/A
<b>VSA Type</b>	N/A
<b>Length</b>	1–253
<b>Value</b>	Opaque value

---

## DHCP-RK

DHCP-RK is a 160-bit randomly generated for every DHCP server, the DHCP Key is derived from this.

<b>Type</b>	26
<b>Vendor ID</b>	24757
<b>VSA Type</b>	40
<b>Length</b>	1–250
<b>Value</b>	Opaque value

---

## DHCP-RK-Key-ID

An integer uniquely identifying the DHCP-RK within the scope of a single DHCP server.

**Type**

26

**Vendor ID**

24757

**VSA Type**

41

**Length**

4

**Value**

Unsigned Integer

---

## DHCP-RK-Lifetime

Lifetime of the DHCP-RK and derived keys.

**Type**

26

**Vendor ID**

24757

**VSA Type**

42

**Length**

4

**Value**

Unsigned Integer

---

## DHCPMSG-Server-IP

The IPv4 address of the DHCP server.

**Type**

26

**Vendor ID**

24757

**VSA Type**

43

**Length**

4

**Value**

IPv4 address

---

## Digest-AKA-Auts

This attribute holds the auts parameter that is used in the Digest AKA calculation.

**Type**

118

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

0-253

**Value**

ASCII string

---

## Digest-Algorithm

This parameter holds the algorithm parameter that influences the HTTP Digest calculation.

**Type**

111

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

0-253

**Value**

Opaque value

---

## Digest-Auth-Param

This attribute is a placeholder for future extensions.

**Type**

117

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

0-253

**Value**

Opaque value

## Digest-CNonce

This attribute holds the client nonce that is used in the digest calculation.

**Type**

113

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

0-253

**Value**

Opaque value

## Digest-Domain

This attribute consists of single URI that defines a protection space component.

**Type**

119

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

0-256

**Value**

Opaque value

## Digest-Entity-Body-Hash

This attribute holds the hexadecimal representation of H(entity-body). This hash is required when quality of protection is set to “auth-int”.

**Type**

112

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

0-253

**Value**

Hexadecimal string

---

## Digest-HA1

This attribute contains the hexadecimal representation on H(A1) as described in RFC 2617.

**Type**

121

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

0-253

**Value**

ASCII string

---

## Digest-Method

This attribute holds the method value to be used in the HTTP digest calculation.

**Type**

108

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

0-253

**Value**

ASCII string

---

## Digest-Nexnonce

This attribute holds a nonce to be used in the HTTP digest calculation.

**Type**

107

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

0-253

**Value**

Hexadecimal string

## ■ Attributes

---

## Digest-Nonce-Count

This attribute holds the nonce count parameter that is used to detect replay attacks.

**Type**

114

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

0-253

**Value**

ASCII string

---

## Digest-Opaque

This attribute holds the opaque parameter that is passed to the SIP client.

**Type**

116

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

0-253

**Value**

ASCII string

---

## Digest-Qop

This attribute holds the quality of protection parameter that influences the HTTP digest calculation.

**Type**

110

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

0-253

**Value**

ASCII string

---

## Digest-Realm

This attribute describes a protection space component of the RADIUS server.

**Type**

104

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

0-253

**Value**

ASCII string

---

## Digest-Response-Auth

This enables the RADIUS server to prove possession of the password.

**Type**

106

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

0-253

**Value**

Hexadecimal string.

---

## Digest-Stale

This attribute is sent by RADIUS server in order to notify the RADIUS client whether it has accepted a nonce.

**Type**

120

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

0-253

**Value**

ASCII string. The following are valid values for this attribute:

**■ Attributes**

- False = 0
- True = 1

---

## Digest-URI

This attribute is used to transport the contents of the URI of the SIP request.

**Type**

109

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

0-253

**Value**

ASCII string

---

## Digest-Username

This attribute holds the user name used in the HTTP Digest calculation.

**Type**

115

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

0-253

**Value**

ASCII string

---

## DNS

IPv4/IPv6 address of the DNS server to be conveyed to the MS via DHCP.

**Type**

26

**Vendor ID**

24757

**VSA Type**

52

**Length**

4–16

**Value**

Opaque value

## EAP-Message

The EAP exchanged transported over RADIUS.

**Type**

79

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

0–253

**Value**

Opaque value

## Error-Cause

It is possible that the NAS cannot honor Disconnect-Request or CoA-Request messages for some reason. The Error-Cause Attribute provides more detail on the cause of the problem. It may be included within Disconnect-ACK, Disconnect-NAK, and CoA-NAK messages.

This attribute is also accepted in CoA response message to be used in a currently active subscriber session.

**Type**

101

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Residual-Session-Context-Remove = 201
- Invalid-EAP-Packet = 202
- Unsupported-Attribute = 401
- Missing-Attribute = 402
- NAS-Identification-Mismatch = 403
- Invalid-Request = 404
- Unsupported-Service = 405

**■ Attributes**

- Unsupported-Extension = 406
- Administratively-Prohibited = 501
- Request-Not-Routable = 502
- Session-Context-Not-Found = 503
- Session-Context-Not-Removable = 504
- Other-Proxy-Processing-Error = 505
- Resources-Unavailable = 506
- Request-Initiated = 507
- Session-Context-Not-Removable-Dormant = 599

---

## Event-Timestamp

This attribute is a timestamp of when the event being logged occurred, indicating the time in seconds since January 1, 1970 00:00 UTC. Note that this is equivalent to the UNIX operating system expression of time.

This attribute is also accepted in CoA request and response messages to be used in a currently active subscriber session.

**Type**

55

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

4

**Value**

Unsigned integer

---

## FA-RK-KEY

This attribute contains the encrypted FA-RK-KEY. The FA-RK determined during EAP authentication by the RADIUS server and passed on to the NAS upon successful EAP authentication. It is used by the NAS to generate MN-FA keys.

**Type**

26

**Vendor ID**

24757

**VSA Type**

14

**Length**

1–244

**Value**

Opaque value

---

## FA-RK-SPI

SPI used for the FA-RK associated with FA-RK Key for generating MN-FA key for WiMAX call

**Type**  
26

**Vendor ID**  
24757

**VSA Type**  
61

**Length**  
4

**Value**  
Unsigned integer

---

## Filter-Id

This attribute identifies the IP access-list/filter by name.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

By default, a Filter-Id is applied in both directions. To apply a filter in a single direction, add the prefix “in:” or “out:” to the access-list name in the Filter-Id. Syntax:

in:<filter\_name>

This assigns an input filter identified by filter\_name

out:<filter\_name>

This assigns an output filter identified by filter\_name <filter\_name>

If the Filter-Id value in the Access Accept message is invalid this value will not be applied to the session.

If this AVP is missing in the Access Accept message the value configured in the APN / subscriber template, if any, will be taken.

**Type**  
11

**Vendor ID**  
N/A

**VSA Type**  
N/A

**Length**  
1-253

**Value**  
ASCII string

---

## Framed-Compression

This attribute indicates the compression protocol to be used.

## ■ Attributes

**Type** 13

**Vendor ID** N/A

**VSA Type** N/A

**Length** 4

**Value** Enumerated integer. Supported values are:

- None = 0 — Do not use compression
- VJ\_TCP\_IP\_header\_compression = 1 — Use VJ TCP/IP header compression
- IPX\_header\_compression = 2
- Stac\_LZS\_compressions = 3 — Use Stac-LZS compression

## Framed-Interface-Id

This attribute contains the value of IPv6 Interface ID.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type** 96

**Vendor ID** N/A

**VSA Type** N/A

**Length** 8

**Value** Opaque value

## Framed-IP-Address

This attribute indicates the IP address to be configured for the user.

This attribute is also accepted in CoA request and response messages to be used in a currently active subscriber session.

**Type** 8

**Vendor ID** N/A

**VSA Type** N/A

**Length**

4

**Value**

An IP address as it would appear in the source or destination field of an IP header. Special values are:

- 255.255.255.255 — User selected address
- 255.255.255.254 — Assign address from a pool (see [Framed-Pool](#) and [SN-IP-Pool-Name](#) )

---

## Framed-IP-Netmask

This attribute indicates the IP netmask to be configured for the session when the PPP connection is to a router servicing a network.

**Type**

9

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

4

**Value**

An IP netmask specified in IPv4 address format.

---

## Framed-IPv6-Pool

This attribute contains the IPv6 pool name.

**Type**

100

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

1–253

**Value**

String

---

## Framed-IPv6-Prefix

This attribute contains IPv6 prefix.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

## ■ Attributes

97

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

2–18

**Value**

Opaque value

## Framed-MTU

This attribute indicates the Maximum Transmission Unit that was configured for the PPP session.

**Type**

12

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

4

**Value**

Integer. Supported values are from 64 through 4096.

## Framed-Pool

This standard attribute indicates the name of the IP pool from which an IP address should be allocated to the subscriber. Also, see **SN-IP-Pool-Name**, which is a vendor-specific attribute accomplishing the same.

**Type**

88

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

1–253

**Value**

String

## Framed-Protocol

This attribute describes the framed protocol that the user is granted to use (Access-Accept), when Service-Type = Framed. Note that PPP is the only framed protocol supported.

**Type**

7

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

4

**Value**

Enumerated integer. Supported values are:

- PPP = 1
- SLIP = 2
- ARAP = 3
- Gandalf\_proprietary\_\_\_\_ = 4
- Xylogics\_proprietary\_IPX\_SLIP = 5
- X\_75\_Synchronous = 6
- GPRS\_PDP\_Context = 7

## Framed-Route

This attribute specifies the subnet route to be installed in GGSN for the mobile router.

If the GGSN receives a packet with a destination address matching the Framed-Route, the packet is forwarded to the mobile router through the associated PDP context.

This attribute is accepted in the Access-Accept message and can appear multiple times. The format of value to be assigned to the Framed-Route attribute should be as follows:

*<dest-ip>/<net-mask> <gateway-ip> hops*

- or -

*<dest-ip> <subnet-mask> <gateway-ip> hops*

For example, Framed-Route = 40.40.41.0/24



**Important:** Please note that the *<gateway-ip>* and *hops* are optional.

If the *gateway\_ip* is 0.0.0.0 then the mobile node's (user's) IP is considered as the Gateway IP.



**Important:** The maximum number of framed routes allowed per subscriber is 10.

**■ Attributes**

These framed routes are established at the time of call setup and deleted when the call is terminated.

**Type**

61

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

In StarOS 8.x and earlier: 16; in StarOS 9.0 and later: 1–64

**Value**

Opaque value

## Geographical-Location

This attribute contains the information of geographical location as reported by HNB.

**Type**

26

**Vendor ID**

9

**VSA Type**

114

**Length**

10

**Value**

Opaque value

## GGSN-GTP-IP-Address

Same as **3GPP-GGSN-Address** standard attribute; non-standard behavior for use in custom dictionary.

**Type**

230

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

4

**Value**

IPv4 address

---

## HA-IP-MIP4

IPv4 address of the HA.

**Type**  
26

**Vendor ID**  
24757

**VSA Type**  
6

**Length**  
4

**Value**  
IPv4 address

---

## HA-IP-MIP6

IPv6 address of the HA for CMIP4.

**Type**  
26

**Vendor ID**  
24757

**VSA Type**  
7

**Length**  
4–16

**Value**  
Opaque value

---

## HA-RK-KEY

The HA-RK-KEY determined during EAP authentication by the RADIUS server and passed to the NAS upon successful EAP authentication. It is used by the NAS to generate FA-HA keys.

**Type**  
26

**Vendor ID**  
24757

**VSA Type**  
15

**Length**  
1–244

**Value**  
Opaque value

## ■ Attributes

---

## HA-RK-Lifetime

Lifetime of the HA-RK and derived keys.

**Type**

26

**Vendor ID**

24757

**VSA Type**

17

**Length**

4

**Value**

Unsigned integer

---

## HA-RK-SPI

The SPI associated with the HA-RK for generating MN-HA key for WiMAX call.

**Type**

26

**Vendor ID**

24757

**VSA Type**

16

**Length**

4

**Value**

Unsigned integer

---

## hLMA-IPv6-PMIP6

MIPv6 Home Agent address received in binding update.

**Type**

26

**Vendor ID**

24757

**VSA Type**

127

**Length**

2

**Value**

Opaque value

## HNB-Internet-Information

This attribute contains public IP address (either IPv4 or IPv6 address) of HNB assigned through the broadband connection.

<b>Type</b>	26
<b>Vendor ID</b>	9
<b>VSA Type</b>	115
<b>Length</b>	4–16
<b>Value</b>	Opaque value

## HNB-Parameters

This attribute contains PLMN ID, LAC, RAC, SAC, and Cell ID of the HNB as reported to HNB-GW in RADIUS Access-Request during authentication.

<b>Type</b>	26
<b>Vendor ID</b>	9
<b>VSA Type</b>	112
<b>Length</b>	12
<b>Value</b>	Opaque value

## Hotline-Indicator

This attribute in a RADIUS Accounting-Request message indicates to back-office systems (billing audit systems) that the session has been hot lined.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

<b>Type</b>	26
<b>Vendor ID</b>	24757
<b>VSA Type</b>	24
<b>Length</b>	In 10.2 and earlier releases: 1–246

**■ Attributes**

In 11.0 and later releases: 1–54

**Value**

In 10.2 and earlier releases: Opaque value

In 11.0 and later releases: String

## Hotline-Profile-ID

A unique identifier of a hotline profile to be applied to the session.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

24757

**VSA Type**

53

**Length**

In 10.2 and earlier releases: 1–246

In 11.0 and later releases: 1–64

**Value**

In 10.2 and earlier releases: Opaque value

In 11.0 and later releases: String

## Hotline-Session-Timer

The time period, in seconds, the session can remain hotlined.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

24757

**VSA Type**

56

**Length**

4

**Value**

Unsigned Integer

## HTTP-Redirection-Rule

An HTTP redirection rule.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

<b>Type</b>	26
<b>Vendor ID</b>	24757
<b>VSA Type</b>	54
<b>Length</b>	1–246
<b>Value</b>	Opaque value

---

## Idle-Timeout

This attribute sets the maximum idle session time, in seconds. A session is idle when there is no IP traffic on the link. After the connection has been idle for the indicated amount of time, the chassis will tear down the session.

<b>Type</b>	28
<b>Vendor ID</b>	N/A
<b>VSA Type</b>	N/A
<b>Length</b>	4
<b>Value</b>	Integer

---

## IMSI

Same as **3GPP-IMSI** standard attribute; non-standard behavior for use in custom dictionary.

<b>Type</b>	224
<b>Vendor ID</b>	N/A
<b>VSA Type</b>	N/A
<b>Length</b>	1–6
<b>Value</b>	ASCII string

---

## IMSI-MCC-MNC

Same as **3GPP-IMSI-Mcc-Mnc** standard attribute; non-standard behavior for use in custom dictionary.

**Type**

226

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

1–6

**Value**

String.

---

## In-Packet-Period

Opaque 4 byte value received in Access Accept. This will be included in accounting messages for the session. Used in custom dictionary.

**Type**

136

**Vendor ID**

5535 (Reusing the 3GPP2 VID in a non-standard way.)

**VSA Type**

247

**Length**

Unsigned integer

---

## IP-Redirection-Rule

This attribute is used to specify which packet flow to redirect and where to redirect it.

**Type**

26

**Vendor ID**

24757

**VSA Type**

55

**Length**

1–246

**Value**

Opaque value

---

## Macro-Coverage-Information

This attribute contains the marco coverage information as reported by HNB which could be a GERAN or UTRAN cell information.

**Type**

26

**Vendor ID**

9

**VSA Type**

113

**Length**

8–11

**Value**

Opaque value

---

## MN-HA-MIP4-KEY

MN-HA key for SPI value in the Access request if present.

**Type**

26

**Vendor ID**

24757

**VSA Type**

10

**Length**

1–244

**Value**

Opaque value

---

## MN-HA-MIP4-SPI

SPI associated with the MN-HA-MIP4 key. This attribute needs to be sent in the Access Request to fetch the corresponding MN-HA keys.

**Type**

26

**Vendor ID**

24757

**VSA Type**

11

**Length**

4

**Value**

**■ Attributes**

Unsigned integer

---

## MN-HA-MIP6-KEY

Used to calculate AUTH for MIP6 BU during PMIP6 on ASN and to validate and compute AUTH for MIP6 Binding Answer on HA.

**Type**

26

**Vendor ID**

24757

**VSA Type**

12

**Length**

1–244

**Value**

Opaque value

---

## MN-HA-MIP6-SPI

SPI associated with the MN-HA-MIP6-KEY.

**Type**

26

**Vendor ID**

24757

**VSA Type**

12

**Length**

4

**Value**

Unsigned integer

---

## MSISDN

MSISDN of the call. Used in custom dictionary.

**Type**

136

**Vendor ID**

5535 (Reusing the 3GPP2 VID in a non-standard way.)

**VSA Type**

222

**Length**

1-256

**Value**

String

---

## MSK

The Master Session Key determined during EAP authentication by the RADIUS server and passed to the NAS upon successful EAP authentication.

**Type**

26

**Vendor ID**

24757

**VSA Type**

5

**Length**

1-246

**Value**

Opaque value

---

## NAS-Filter-Rule

Indicates filter rules to be applied for the user.

**Type**

92

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

1-246

**Value**

Opaque value

---

## NAS-Identifier

This attribute identifies the NAS generating the record.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

32

**Vendor ID**

N/A

**■ Attributes****VSA Type**  
N/A**Length**  
1–253**Value**  
ASCII string

## NAS-IP-Address

This attribute identifies the serving NAS.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**  
4**Vendor ID**  
N/A**VSA Type**  
N/A**Length**  
4**Value**  
An IP address as it would appear in the source or destination field of an IP header.

## NAS-Port

This attribute describes the assigned resource number to the user session. It is guaranteed to be unique at a particular instance in time for a particular chassis.

**Type**  
5**Vendor ID**  
N/A**VSA Type**  
N/A**Length**  
4**Value**  
Unsigned integer

## NAS-Port-Type

This attribute indicates the physical layer that the session is using.

**Type**

61

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Async = 0
- Sync = 1
- ISDN\_Sync = 2
- ISDN\_Async\_V\_120 = 3
- ISDN\_Async\_V\_110 = 4
- Virtual = 5 – MGMT
- PIAFS = 6
- HDLC\_Clear\_Channel = 7
- X\_25 = 8
- X\_75 = 9
- G\_3\_Fax = 10
- SDSL\_Symmetric\_DSL = 11
- ADSL\_CAP = 12
- ADSL\_DMT = 13
- IDSL = 14
- Ethernet = 15
- xDSL = 16
- Cable = 17
- Wireless\_Other = 18 – Other wireless
- Wireless\_IEEE\_802\_11 = 19 – Wireless IEEE 802.11
- Token\_Ring = 20
- FDDI = 21
- Wireless\_CDMA2000 = 22
- Wireless\_UMTS = 23
- HRPD = 24 — High Rate Packet Data. HRPD is only available if included in the custom dictionary. None of the standard dictionaries include it.
- IAPP = 25
- FTTP = 26
- Wireless\_IEEE\_802\_16 = 27

**■ Attributes**

- Wireless\_IEEE\_802\_20 = 28
- Wireless\_IEEE\_802\_22 = 29
- Wireless\_XGP=36

---

## PMIP-Authenticated-Nwk-Id

The real user identifier returned by hAAA after successful authentication.

**Type**

26

**Vendor ID**

24757

**VSA Type**

In 10.2 and earlier releases: 58

In 11.0 and later releases: 78

**Length**

1–246

**Value**

Opaque value

---

## PMIP6-RK-KEY

The PMIP6-RK-KEY sent by the RADIUS Server to the ASN and hCSN LMA for PMIP6. It is used to calculate the individual LMA-MAG key being the base for PBU and PBA messages protection through mobility authentication options.

**Type**

26

**Vendor ID**

24757

**VSA Type**

131

**Length**

1–251

**Value**

Opaque value

---

## PMIP6-RK-SPI

The SPI associated with the PMIP6-RK-KEY.

**Type**

26

**Vendor ID**

24757

---

<b>VSA Type</b>	132
<b>Length</b>	1-251
<b>Value</b>	Opaque value

---

## PMIP6-Service-Info

Indicates which PMIPv6 features are supported and enabled on ASN/LMA.

<b>Type</b>	26
<b>Vendor ID</b>	24757
<b>VSA Type</b>	126
<b>Length</b>	2
<b>Value</b>	Unsigned Integer

---

## Price-Plan

Opaque 1 byte value received from customer RADIUS server in access request. We need to retain this value and return it back in all future accounting messages. Used in custom dictionary.

<b>Type</b>	136
<b>Vendor ID</b>	5535 (Reusing the 3GPP2 VID in a non-standard way.)
<b>VSA Type</b>	196
<b>Length</b>	1
<b>Value</b>	The system does not interpret this value, but it is copied in accounting messages.

---

## Primary-DNS-Server

Same as **SN1-Primary-DNS-Server** standard attribute; non-standard behavior for use in custom dictionary.

<b>Type</b>	135
-------------	-----

## ■ Attributes

<b>Vendor ID</b>	N/A
<b>VSA Type</b>	N/A
<b>Length</b>	4
<b>Value</b>	IPv4 address

---

## Prohibit-Payload-Compression

Flag to prohibit SGSN from compressing user data on per APN basis.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	237
<b>Length</b>	2
<b>Value</b>	Enumerated integer. Supported values are: <ul style="list-style-type: none"> <li>• Allowed = 0</li> <li>• Prohibited = 1</li> </ul>

---

## Prohibit-Payload-Compression1

Flag to prohibit SGSN from compressing user data on per APN basis.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	237
<b>Length</b>	2
<b>Value</b>	Enumerated integer. Supported values are: <ul style="list-style-type: none"> <li>• Allowed = 0</li> <li>• Prohibited = 1</li> </ul>

---

## Reject-Cause

This attribute indicates the cause for sending Access-Reject.

<b>Type</b>	26
<b>Vendor ID</b>	9
<b>VSA Type</b>	116
<b>Length</b>	1
<b>Value</b>	Opaque value

---

## Reply-Message

This attribute indicates the text to be displayed to a user upon completion of authentication, whether successful or not.

<b>Type</b>	18
<b>Vendor ID</b>	N/A
<b>VSA Type</b>	N/A
<b>Length</b>	1–2048
<b>Value</b>	An ASCII string to be displayed to the user. This attribute may appear more than once, in which case the string displayed to the user is a concatenation of the Reply-Message attributes in the order in which they appear in the RADIUS response message.

---

## RRQ-MN-HA-KEY

MN-HA key computed using RRQ-HA-IP if sent in Access request.

<b>Type</b>	26
<b>Vendor ID</b>	24757
<b>VSA Type</b>	19
<b>Length</b>	1–244
<b>Value</b>	

**■ Attributes**

Opaque value

---

## Secondary-DNS-Server

Same as **SN1-Secondary-DNS-Server** standard attribute; non-standard behavior for use in custom dictionary.

<b>Type</b>	136
<b>Vendor ID</b>	N/A
<b>VSA Type</b>	N/A
<b>Length</b>	4
<b>Value</b>	IPv4 address

---

## Selection-Mode

Same as **3GPP-Selection-Mode** standard attribute; non-standard behavior for use in custom dictionary.

<b>Type</b>	229
<b>Vendor ID</b>	N/A
<b>VSA Type</b>	N/A
<b>Length</b>	1
<b>Value</b>	Opaque value

---

## Service-Type

This attribute identifies the service that the user is attempting to use (Access-Request), or is granted to use (Access-Accept).

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

<b>Type</b>	6
<b>Vendor ID</b>	N/A
<b>VSA Type</b>	N/A
<b>Length</b>	

4

**Value**

Enumerated integer. Supported values are:

- Framed = 2—PPP or HA session
- Administrative = 6—Configuration administration CLI session
- Authenticate\_Only = 8
- Inspector = 19650516—Configuration/statistics read-only CLI session
- Security\_Admin = 19660618—Security administration CLI session

The following values are not supported, used only for display/decoding purposes:

- Login = 1
- Callback\_Login = 3
- Callback\_Framed = 4
- Outbound = 5
- NAS\_Prompt = 7—CLI session
- Callback\_NAS\_Prompt = 9
- Call\_Check = 10
- Callback\_Administrative = 11
- Voice = 12
- Fax = 13
- Modem\_Relay = 14
- IAPP\_Register = 15
- IAPP\_AP\_Check = 16
- Authorize\_Only = 17—RADIUS Change of Authorize/Disconnect/Prepaid Access Requests

## Session-Timeout

This attribute sets the maximum session time in seconds. After this session time expires the chassis will tear down the session.

**Type**

27

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

4

**Value**

Unsigned integer

---

## SGSN-IP-Address

Same as **3GPP-SGSN-Address** standard attribute; non-standard behavior for use in custom dictionary.

**Type**

228

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

4

**Value**

IPv4 address

---

## SIP-AOR

This attribute identifies the URI, the use of which must be authenticated and authorized.

**Type**

122

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

0–253

**Value**

ASCII string

---

## SN-Access-link-IP-Frag

This attribute specifies what to do when data received for the subscriber on the Access link that needs to be fragmented and the DF bit is either set or unset. The default is Normal.

**Type**

26

**Vendor ID**

8164

**VSA Type**

63

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Normal = 0 — Data to be fragmented is not fragmented if the DF bit is set
- DF-Ignore = 1 — Fragment regardless
- DF-Fragment-ICMP-Notify = 2 — Fragment regardless, and ICMP Notify if DF bit is set

---

## SN-Acct-Input-Giga-Dropped

This attribute contains the number of input gigawords dropped if the number of input bytes is greater than  $2^{32} - 1$ .

**Type** 26  
**Vendor ID** 8164  
**VSA Type** 230  
**Length** 4  
**Value** Unsigned integer

---

## SN-Acct-Input-Octets-Dropped

This attribute indicates how many octets received have been dropped in the PPP session. Since the value field is 32 bits, it is possible that the number of octets will exceed the 32-bit field length. If this happens, this attribute will “wrap” back to 0. Each time the “wrap” occurs, the SN-Acct-Input-Giga-Dropped attribute will be incremented.

**Type** 26  
**Vendor ID** 8164  
**VSA Type** 228  
**Length** 8  
**Value** Unsigned integer

---

## SN-Acct-Input-Packets-Dropped

This attribute indicates how many PPP packets received have been dropped during the session.

**Type** 26  
**Vendor ID** 8164

## ■ Attributes

**VSA Type**  
226

**Length**  
4

**Value**  
Unsigned integer

## SN-Acct-Output-Giga-Dropped

This attribute contains the number of output gigawords dropped if the number of output bytes is greater than  $2^{32} - 1$ .

**Type**  
26

**Vendor ID**  
8164

**VSA Type**  
231

**Length**  
4

**Value**  
Unsigned integer

## SN-Acct-Output-Octets-Dropped

This attribute indicates how many octets have been dropped in the PPP session. Since the value field is 32 bits, it is possible that the number of octets will exceed the 32-bit field length. If this happens, this attribute will “wrap” back to 0. Each time the “wrap” occurs, the SN-Acct-Output-Giga-Dropped attribute will be incremented.

**Type**  
26

**Vendor ID**  
8164

**VSA Type**  
229

**Length**  
8

**Value**  
Unsigned integer

## SN-Acct-Output-Packets-Dropped

This attribute indicates how many output PPP packets have been dropped during the session.

**Type**  
26

**Vendor ID**  
8164

**VSA Type**  
227

**Length**  
4

**Value**  
Unsigned integer

---

## SN-Acs-Credit-Control-Group

This attribute contains the Diameter Credit Control Group name. It is used to send the Credit Control Group name from APN config to the ACS module.

**Type**  
26

**Vendor ID**  
8164

**VSA Type**  
301

**Length**  
1–63

**Value**  
String

---

## SN-Admin-Expiry

This attribute contains the date/time the administrative user account expires. It is an integer value specifying the number of seconds since the UNIX epoch at which time the account will expire.

**Type**  
26

**Vendor ID**  
8164

**VSA Type**  
204

**Length**  
4

**Value**  
Integer

## ■ Attributes

---

## SN-Admin-Permission

This attribute indicates the services allowed to be delivered to the administrative user. The attribute value is a bit field, and many algorithms can be specified to indicate that one of these may be chosen by the user.

**Type**

26

**Vendor ID**

8164

**VSA Type**

21

**Length**

4

**Value**

Enumerated integer. Supported values are:

- None = 0
- CLI = 1
- FTP = 2
- CLI-FTP = 3
- Intercept = 4
- CLI-Intercept = 5
- CLI-Intercept-FTP = 7
- ECS = 8
- CLI-ECS = 9
- CLI-FTP-ECS = 11
- CLI-Intercept-ECS = 13
- CLI-Intercept-FTP-ECS = 15

---

## SN-ANID

This attribute contains the Access Network ID.

**Type**

26

**Vendor ID**

5535

**VSA Type**

178

**Length**

10

**Value**

Opaque value

---

## SN-Assigned-VLAN-ID

This attribute contains the Assigned VLAN ID.

**Type**  
26

**Vendor ID**  
8164

**VSA Type**  
152

**Length**  
2

**Value**  
Unsigned integer

---

## SN-Authorised-Qos

This attribute contains the authorized QoS.

**Type**  
26

**Vendor ID**  
8164

**VSA Type**  
266

**Length**  
4

**Value**  
ASCII string

---

## SN-Bandwidth-Policy

This attribute contains the Traffic Policy value.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

If this AVP is present in Access Accept message the locally configured APN value will be overridden. If there is no value configured in the APN this policy will not be applied.

**Type**  
26

**Vendor ID**  
8164

**VSA Type**  
300

**Length**

**■ Attributes**

1–63

**Value**

String

## SN-Call-Id

This attribute contains the Call ID.

**Type**

26

**Vendor ID**

8164

**VSA Type**

251

**Length**

4

**Value**

Unsigned integer

## SN-Cause-Code

This attribute includes the termination cause code value from IMS node.

**Type**

26

**Vendor ID**

8164

**VSA Type**

267

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Normal\_End\_Of\_Session = 0
- Successful\_Transaction = 1
- End\_Of\_Subscriber\_Dialog = 2
- 3XX\_Redirection = 3
- 4XX\_Request\_Failure = 4
- 5XX\_Server\_Failure = 5
- 6XX\_Global\_Failure = 6
- Unspecified\_Error = 7
- Unsuccessful\_Session\_Setup = 8

- Internal\_Error = 9

---

## SN-Cause-For-Rec-Closing

This attribute contains the GGSN Specific Record Closing Reason Value.

**Type**

26

**Vendor ID**

8164

**VSA Type**

139

**Length**

4

**Value**

Unsigned integer

---

## SN-CBB-Policy

This attribute contains the CBB policy name.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

If this AVP is present in Access Accept message the locally configured APN value will be overridden. If there is no value configured in the APN this policy will not be applied.

**Type**

26

**Vendor ID**

8164

**VSA Type**

302

**Length**

1–63

**Value**

String

---

## SN-CF-Call-International

This attribute contains enable/disable config for CF call restriction and dialing permission for international calls.

**Type**

26

**Vendor ID**

8164

**VSA Type**

**■ Attributes**

293

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disable = 0
- Enable = 1

## SN-CF-Call-Local

This attribute contains enable/disable config for CF call restriction and dialing permission for local calls.

**Type**

26

**Vendor ID**

8164

**VSA Type**

291

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disable = 0
- Enable = 1

## SN-CF-Call-LongDistance

This attribute contains enable/disable config for CF call restriction and dialing permission for long distance calls.

**Type**

26

**Vendor ID**

8164

**VSA Type**

292

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disable = 0
- Enable = 1

---

## SN-CF-Call-Premium

This attribute contains enable/disable config for CF call restriction and dialing permission for premium calls.

**Type**

26

**Vendor ID**

8164

**VSA Type**

294

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disable = 0
- Enable = 1

---

## SN-CF-Call-RoamingInternatnl

This attribute contains enable/disable config for CSCF call restriction and dialing permission - Roaming International call.

**Type**

26

**Vendor ID**

8164

**VSA Type**

298

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disable = 0
- Enable = 1

---

## SN-CF-Call-Transfer

This attribute contains enable/disable config for CSCF call feature - call transfer.

**Type**

26

**Vendor ID**

8164

**VSA Type**

285

**■ Attributes****Length**

4

**Value**

Enumerated integer. Supported values are:

- Disable = 0
- Enable = 1

## SN-CF-Call-Waiting

This attribute contains enable/disable config for CSCF call feature - call waiting.

**Type**

26

**Vendor ID**

8164

**VSA Type**

284

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disable = 0
- Enable = 1

## SN-CF-CId-Display

This attribute contains enable/disable config for CSCF call feature — caller ID display.

**Type**

26

**Vendor ID**

8164

**VSA Type**

282

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disable = 0
- Enable = 1

---

## SN-CF-CId-Display-Blocked

This attribute contains enable/disable config for CSCF call feature — caller ID display blocked.

**Type**

26

**Vendor ID**

8164

**VSA Type**

283

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disable = 0
- Enable = 1

---

## SN-CF-Follow-Me

This attribute contains URIs for CSCF call feature — follow me.

**Type**

26

**Vendor ID**

8164

**VSA Type**

281

**Length**

0–255

**Value**

ASCII string

---

## SN-CF-Forward-Busy-Line

This attribute contains URI for CSCF call feature — forward busy line.

**Type**

26

**Vendor ID**

8164

**VSA Type**

279

**Length**

0–255

**■ Attributes****Value**

ASCII string

---

## SN-CF-Forward-No-Answer

This attribute contains URI for CSCF call feature — forward no answer.

**Type**

26

**Vendor ID**

8164

**VSA Type**

278

**Length**

0–255

**Value**

ASCII string

---

## SN-CF-Forward-Not-Regd

This attribute contains URI for CSCF call feature — forward not registered.

**Type**

26

**Vendor ID**

8164

**VSA Type**

280

**Length**

0–255

**Value**

ASCII string

---

## SN-CF-Forward-Unconditional

This attribute contains URI for CSCF call feature — forward unconditional.

**Type**

26

**Vendor ID**

8164

**VSA Type**

277

**Length**

0–255

**Value**

ASCII string

---

## SN-CFPolicy-ID

This attribute contains the Content Filtering policy ID.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

220

**Length**

4

**Value**

Unsigned integer

---

## SN-Change-Condition

The change condition that triggered this record for a GGSN session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

140

**Length**

4

**Value**

Enumerated integer. Supported values are:

- QOSCHANGE = 0
- TARIFFTIMECHANGE = 1
- SGSNCHANGE = 500

---

## SN-Charging-VPN-Name

The Charging Context Name for GGSN sessions.

**Type**

## ■ Attributes

26

**Vendor ID**

8164

**VSA Type**

137

**Length**

1–252

**Value**

ASCII string

## SN-Chrg-Char-Selection-Mode

SN-Chrg-Char-Selection-Mode

**Type**

26

**Vendor ID**

8164

**VSA Type**

138

**Length**

4

**Value**

Unsigned integer

## SN-Content-Disposition

This attribute indicates how the SIP message body or a message body part is to be interpreted.

**Type**

26

**Vendor ID**

8164

**VSA Type**

272

**Length**

4

**Value**

ASCII string

## SN-Content-Length

This attribute contains size of the SIP message body.

---

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	271
<b>Length</b>	4
<b>Value</b>	ASCII string

---

## SN-Content-Type

This attribute contains the media type of the SIP message body.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	270
<b>Length</b>	4
<b>Value</b>	ASCII string

---

## SN-CR-International-Cid

Carrier ID for routing international calls.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	295
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## SN-CR-LongDistance-Cid

Carrier ID for routing long distance calls.

**Type**

26

**Vendor ID**

8164

**VSA Type**

296

**Length**

4

**Value**

Unsigned integer

---

## SN-CSCF-App-Server-Info

This is a compound attribute and contains information about application servers.

**Type**

26

**Vendor ID**

8164

**VSA Type**

275

**Length**

4

**Value**

Contains the following two subattributes:

---

### App-Server

Holds URL of the application server.

**Type**

1

**Length**

4

**Value**

ASCII string

---

### AS-Called-Party-Address

Holds the called party addresses determined by the application server.

**Type**

2

**Length**

4

**Value**

ASCII string

## SN-CSCF-Rf-SDP-Media-Components

This is a compound attribute for IMS SDP media components.

**Type**

26

**Vendor ID**

8164

**VSA Type**

273

**Value**

Contains the following subattributes:

### Media-Name

Name of the media as available in the SDP data.

**Type**

1

**Length**

0–128

**Value**

String

### Media-Description

Holds the attributes of the media as available in the SDP data.

**Type**

2

**Length**

0–128

**Value**

String

### Authorised-QoS

Holds the 3GPP Authorised QoS string.

**Type**

3

**■ Attributes**

**Length**  
0–128

**Value**  
String

---

**3GPP-Charging-Id**

Holds the 3GPP charging ID.

**Type**  
4

**Length**  
0–253

**Value**  
String

---

**Access-Network-Charging-Identifier-Value**

Holds the access network charging identifier value.

**Type**  
5

**Length**  
1–256

**Value**  
Opaque value

---

**SN-Cscf-Subscriber-Ip-Address**

This attribute contains the IP address of subscriber, used for early IMS authentication procedures.

**Type**  
26

**Vendor ID**  
8164

**VSA Type**  
287

**Length**  
4

**Value**  
IPv4 address

---

**SN-Data-Tunnel-Ignore-DF-Bit**

This attribute specifies if the PDSN/FA or HA should ignore the DF bit in the IPv4 header when encapsulating the IPv4 packet in MIP, and therefore fragmenting the resulting tunneled packet if necessary. The default is not to ignore the DF bit.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	49
<b>Length</b>	4
<b>Value</b>	<p>Enumerated integer. Supported values are:</p> <ul style="list-style-type: none"> <li>• Disabled = 0 — Do not ignore DF bit</li> <li>• Enabled = 1 — Ignore DF bit</li> </ul>

---

## SN-DHCP-Lease-Expiry-Policy

This attribute specifies whether to renew or disconnect on expiry of IP address lease time.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	157
<b>Length</b>	4
<b>Value</b>	<p>Enumerated integer. Supported values are:</p> <ul style="list-style-type: none"> <li>• auto-renew = 0</li> <li>• disconnect = 1</li> </ul>

---

## SN-DHCP-Options

Specific information to be sent from the DHCP server to the client.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	309
<b>Length</b>	1–245
<b>Value</b>	

## ■ Attributes

Opaque value

---

## SN-Direction

ROHC protocol control that specifies in which direction to enable Robust Header Compression (ROHC).

**Type**

26

**Vendor ID**

8164

**VSA Type**

153

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Any = 0
- Uplink = 1
- Downlink = 2

---

## SN-Disconnect-Reason

This attribute indicates the reason the user was disconnected from service.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

3

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Not-Defined = 0
- Admin-Disconnect = 1
- Remote-Disconnect = 2
- Local-Disconnect = 3
- Disc-No-Resource = 4
- Disc-Excd-Service-Limit = 5
- PPP-LCP-Neg-Failed = 6

- PPP-LCP-No-Response = 7
- PPP-LCP-Loopback = 8
- PPP-LCP-Max-Retry = 9
- PPP-Echo-Failed = 10
- PPP-Auth-Failed = 11
- PPP-Auth-Failed-No-AAA-Resp = 12
- PPP-Auth-No-Response = 13
- PPP-Auth-Max-Retry = 14
- Invalid-AAA-Attr = 15
- Failed-User-Filter = 16
- Failed-Provide-Service = 17
- Invalid-IP-Address-AAA = 18
- Invalid-IP-Pool-AAA = 19
- PPP-IPCP-Neg-Failed = 20
- PPP-IPCP-No-Response = 21
- PPP-IPCP-Max-Retry = 22
- PPP-No-Rem-IP-Address = 23
- Inactivity-Timeout = 24
- Session-Timeout = 25
- Max-Data-Excd = 26
- Invalid-IP-Source-Address = 27
- MSID-Auth-Failed = 28
- MSID-Auth-Failed-No-AAA-Resp = 29
- A11-Max-Retry = 30
- A11-Lifetime-Expired = 31
- A11-Message-Integrity-Failure = 32
- PPP-lcp-remote-disc = 33
- Session-setup-timeout = 34
- PPP-keepalive-failure = 35
- Flow-add-failed = 36
- Call-type-detection-failed = 37
- Wrong-ipcp-params = 38
- MIP-remote-dereg = 39
- MIP-lifetime-expiry = 40
- MIP-proto-error = 41
- MIP-auth-failure = 42
- MIP-reg-timeout = 43

- Invalid-dest-context = 44
- Source-context-removed = 45
- Destination-context-removed = 46
- Req-service-addr-unavailable = 47
- Demux-mgr-failed = 48
- Internal-error = 49
- AAA-context-removed = 50
- invalid-service-type = 51
- mip-relay-req-failed = 52
- mip-rcvd-relay-failure = 53
- ppp-restart-inter-pdsn-handoff = 54
- gre-key-mismatch = 55
- invalid\_tunnel\_context = 56
- no\_peer\_lns\_address = 57
- failed\_tunnel\_connect = 58
- l2tp-tunnel-disconnect-remote = 59
- l2tp-tunnel-timeout = 60
- l2tp-protocol-error-remote = 61
- l2tp-protocol-error-local = 62
- l2tp-auth-failed-remote = 63
- l2tp-auth-failed-local = 64
- l2tp-try-another-lns-from-remote = 65
- l2tp-no-resource-local = 66
- l2tp-no-resource-remote = 67
- l2tp-tunnel-disconnect-local = 68
- l2tp-admin-disconnect\_remote = 69
- l2tpmgr-reached-max-capacity = 70
- MIP-reg-revocation = 71
- path-failure = 72
- dhcp-relay-ip-validation-failed = 73
- gtp-unknown-pdp-addr-or-pdp-type = 74
- gtp-all-dynamic-pdp-addr-occupied = 75
- gtp-no-memory-is-available = 76
- dhcp-relay-static-ip-addr-not-allowed = 77
- dhcp-no-ip-addr-allocated = 78
- dhcp-ip-addr-allocation-tmr-exp = 79
- dhcp-ip-validation-failed = 80

- dhcp-static-addr-not-allowed = 81
- dhcp-ip-addr-not-available-at-present = 82
- dhcp-lease-expired = 83
- lpool-ip-validation-failed = 84
- lpool-static-ip-addr-not-allowed = 85
- static-ip-validation-failed = 86
- static-ip-addr-not-present = 87
- static-ip-addr-not-allowed = 88
- radius-ip-validation-failed = 89
- radius-ip-addr-not-provided = 90
- invalid-ip-addr-from-sgsn = 91
- no-more-sessions-in-aaa = 92
- ggsn-aaa-auth-req-failed = 93
- conflict-in-ip-addr-assignment = 94
- apn-removed = 95
- credits-used-bytes-in = 96
- credits-used-bytes-out = 97
- credits-used-bytes-total = 98
- prepaid-failed = 99
- l2tp-ipsec-tunnel-failure = 100
- l2tp-ipsec-tunnel-disconnected = 101
- mip-ipsec-sa-inactive = 102
- Long-Duration-Timeout = 103
- proxy-mip-registration-failure = 104
- proxy-mip-binding-update = 105
- proxy-mip-inter-pdsn-handoff-require-ip-address = 106
- proxy-mip-inter-pdsn-handoff-mismatched-address = 107
- Local-purge = 108
- failed-update-handoff = 109
- closed\_rp-handoff-complete = 110
- closed\_rp-duplicate-session = 111
- closed\_rp-handoff-session-not-found = 112
- closed\_rp-handoff-failed = 113
- pcf-monitor-keep-alive-failed = 114
- call-internal-reject = 115
- call-restarted = 116
- a11-mn-ha-auth-failure = 117

## ■ Attributes

- a11-badly-formed = 118
- a11-t-bit-not-set = 119
- a11-unsupported-vendor-id = 120
- a11-mismatched-id = 121
- miph-a-dup-home-addr-req = 122
- miph-a-dup-imsi-session = 123
- ha-unreachable = 124
- IPSP-addr-in-use = 125
- miffa-dup-home-addr-req = 126
- miph-a-ip-pool-busyout = 127
- inter-pdsn-handoff = 128
- active-to-dormant = 129
- ppp-renegotiation = 130
- active-start-param-change = 131
- tarrif-boundary = 132
- a11-disconnect-no-active-stop = 133
- nw-reachability-failed-reject = 134
- nw-reachability-failed-redirect = 135
- container-max-exceeded = 136
- static-addr-not-allowed-in-apn = 137
- static-addr-required-by-radius = 138
- static-addr-not-allowed-by-radius = 139
- mip-registration-dropped = 140
- counter-rollover = 141
- constructed-nai-auth-fail = 142
- inter-pdsn-service-optimize-handoff-disabled = 143
- gre-key-collision = 144
- inter-pdsn-service-optimize-handoff-triggered = 145
- intra-pdsn-handoff-triggered = 146
- delayed-abort-timer-expired = 147
- Admin-AAA-disconnect = 148
- Admin-AAA-disconnect-handoff = 149
- PPP-IPV6CP-Neg-Failed = 150
- PPP-IPV6CP-No-Response = 151
- PPP-IPV6CP-Max-Retry = 152
- PPP-Restart-Invalid-source-IPV4-address = 153
- a11-disconnect-handoff-no-active-stop = 154

- call-restarted-inter-pdsn-handoff = 155
- call-restarted-ppp-termination = 156
- mipfa-resource-conflict = 157
- failed-auth-with-charging-svc = 158
- mipha-dup-imsi-session-purge = 159
- mipha-rev-pending-newcall = 160
- volume-quota-reached = 161
- duration-quota-reached = 162
- gtp-user-authentication-failed = 163
- MIP-reg-revocation-no-lcp-term = 164
- MIP-private-ip-no-rev-tunnel = 165
- Invalid-Prepaid-AAA-attr-in-auth-response = 166
- mipha-prepaid-reset-dynamic-newcall = 167
- gre-flow-control-timeout = 168
- mip-paaa-bc-query-not-found = 169
- mipha-dynamic-ip-addr-not-available = 170
- a11-mismatched-id-on-handoff = 171
- a11-badly-formed-on-handoff = 172
- a11-unsupported-vendor-id-on-handoff = 173
- a11-t-bit-not-set-on-handoff = 174
- MIP-reg-revocation-i-bit-on = 175
- A11-RRQ-Deny-Max-Count = 176
- Dormant-Transition-During-Session-Setup = 177
- PPP-Rem-Reneg-Disc-Always-Cfg = 178
- PPP-Rem-Reneg-Disc-NAI-MSID-Mismatch = 179
- mipha-subscriber-ipsec-tunnel-down = 180
- mipha-subscriber-ipsec-tunnel-failed = 181
- mipha-subscriber-ipsecmgr-death = 182
- flow-is-deactivated = 183
- ecsv2-license-exceeded = 184
- IPSG-Auth-Failed = 185
- driver-initiated = 186
- ims-authorization-failed = 187
- service-instance-released = 188
- flow-released = 189
- ppp-renego-no-ha-addr = 190
- intra-pdsn-handoff = 191

## ■ Attributes

- overload-disconnect = 192
- css-service-not-found = 193
- Auth-Failed = 194
- dhcp-client-sent-release = 195
- dhcp-client-sent-nak = 196
- msid-dhcp-chaddr-mismatch = 197
- link-broken = 198
- prog-end-timeout = 199
- qos-update-wait-timeout = 200
- css-synch-cause = 201
- Gtp-context-replacement = 202
- PDIF-Auth-failed = 203
- l2tp-unknown-apn = 204
- ms-unexpected-network-reentry = 205
- r6-invalid-nai = 206
- eap-max-retry-reached = 207
- vbm-hoa-session-disconnected = 208
- vbm-voa-session-disconnected = 209
- in-acl-disconnect-on-violation = 210
- eap-msk-lifetime-expiry = 211
- eap-msk-lifetime-too-low = 212
- mipfa-inter-tech-handoff = 213
- r6-max-retry-reached = 214
- r6-nwexit-recd = 215
- r6-dereg-req-recd = 216
- r6-remote-failure = 217
- r6r4-protocol-errors = 218
- wimax-qos-invalid-aaa-attr = 219
- npu-gre-flows-not-available = 220
- r4-max-retry-reached = 221
- r4-nwexit-recd = 222
- r4-dereg-req-recd = 223
- r4-remote-failure = 224
- ims-authorization-revoked = 225
- ims-authorization-released = 226
- ims-auth-decision-invalid = 227
- mac-addr-validation-failed = 228

- excessive-wimax-pd-flows-cfgd = 229
- sgsn-canc-loc-sub = 230
- sgsn-canc-loc-upd = 231
- sgsn-mnr-exp = 232
- sgsn-ident-fail = 233
- sgsn-sec-fail = 234
- sgsn-auth-fail = 235
- sgsn-glu-fail = 236
- sgsn-imp-det = 237
- sgsn-smgr-purge = 238
- sgsn-subs-handed-to-peer = 239
- sgsn-dns-fail-inter-rau = 240
- sgsn-cont-rsp-fail = 241
- sgsn-hlr-not-found-for-imsi = 242
- sgsn-ms-init-det = 243
- sgsn-opr-policy-fail = 244
- sgsn-duplicate-context = 245
- hss-profile-update-failed = 246
- sgsn-no-pdp-activated = 247
- asnpc-idle-mode-timeout = 248
- asnpc-idle-mode-exit = 249
- asnpc-idle-mode-auth-failed = 250
- asngw-invalid-qos-configuration = 251
- sgsn-dsd-allgprswithdrawn = 252
- r6-pmk-key-change-failure = 253
- sgsn-illegal-me = 254
- sess-termination-timeout = 255
- sgsn-sai-fail = 256
- sgsn-rnc-removal = 257
- sgsn-rai-removal = 258
- sgsn-init-deact = 259
- ggsn-init-deact = 260
- hlr-init-deact = 261
- ms-init-deact = 262
- sgsn-detach-init-deact = 263
- sgsn-rab-rel-init-deact = 264
- sgsn-iu-rel-init-deact = 265

## ■ Attributes

- sgsn-gtpu-path-failure = 266
- sgsn-gtpc-path-failure = 267
- sgsn-local-handoff-init-deact = 268
- sgsn-remote-handoff-init-deact = 269
- sgsn-gtp-no-resource = 270
- sgsn-rnc-no-resource = 271
- sgsn-odb-init-deact = 272
- sgsn-invalid-ti = 273
- sgsn-ggsn-ctxt-non-existent = 274
- sgsn-apn-restrict-vio = 275
- sgsn-regular-deact = 276
- sgsn-abnormal-deact = 277
- sgsn-actv-rejected-by-peer = 278
- sgsn-err-ind = 279
- asngw-non-anchor-prohibited = 280
- asngw-im-entry-prohibited = 281
- session-idle-mode-entry-timeout = 282
- session-idle-mode-exit-timeout = 283
- asnpc-ms-power-down-nwexit = 284
- asnpc-r4-nwexit-recd = 285
- sgsn-iu-rel-before-call-est = 286
- ikev2-subscriber-ipsecmgr-death = 287
- All-dynamic-pool-addr-occupied = 288
- mip6ha-ip-addr-not-available = 289
- bs-monitor-keep-alive-failed = 290
- sgsn-att-in-reg-state = 291
- sgsn-inbound-srns-in-reg-state = 292
- dt-ggsn-tun-reestablish-failed = 293
- sgsn-unknown-pdp = 294
- sgsn-pdp-auth-failure = 295
- sgsn-duplicate-pdp-context = 296
- sgsn-no-rsp-from-ggsn = 297
- sgsn-failure-rsp-from-ggsn = 298
- sgsn-apn-unknown = 299
- sgsn-serv-req-init-deact = 300
- sgsn-attach-on-attach-init-abort = 301
- sgsn-iu-rel-in-israu-init-abort = 302

- sgsn-smgr-init-abort = 303
- sgsn-mm-ctx-cleanup-init-abort = 304
- sgsn-unknown-abort = 305
- sgsn-guard-timeout-abort = 306
- vpn-bounce-dhcpip-validate-req = 307
- mipv6-id-mismatch = 308
- aaa-session-id-not-found = 309
- x1-max-retry-reached = 310
- x1-nwexit-recd = 311
- x1-dereg-req-recd = 312
- x1-remote-failure = 313
- x1x2-protocol-errors = 314
- x2-max-retry-reached = 315
- x2-nwexit-recd = 316
- x2-dereg-req-recd = 317
- x2-remote-failure = 318
- x1-pmk-key-change-failure = 319
- sa-rekeying-failure = 320
- sess-sleep-mode-entry-timeout = 321
- phsgw-non-anchor-prohibited = 322
- asnpc-pc-relocation-failed = 323
- asnpc-pc-relocation = 324
- auth\_policy\_mismatch = 325
- sa-lifetime-expiry = 326
- asnpc-del-ms-entry-recd = 327
- phspc-sleep-mode-timeout = 328
- phspc-sleep-mode-exit = 329
- phspc-sleep-mode-auth-failed = 330
- phspc-ms-power-down-nwexit = 331
- phspc-x2-nwexit-recd = 332
- invalid-nat-config = 333
- asngw-tid-entry-not-found = 334
- No-NAT-IP-Address = 335
- excessive-phs-pd-flows-cfgd = 336
- phsgw-invalid-qos-configuration = 337
- Interim-Update = 338
- sgsn-attach-abrt-rad-lost = 339

## ■ Attributes

- sgsn-inbnd-irau-abrt-rad-lost = 340
- ike-keepalive-failed = 341
- sgsn-attach-abrt-ms-suspend = 342
- sgsn-inbnd-irau-abrt-ms-suspend = 343
- duplicate-session-detected = 344
- sgsn-xid-response-failure = 345
- sgsn-nse-cleanup = 346
- sgsn-gtp-req-failure = 347
- sgsn-imsi-mismatch = 348
- sgsn-bvc-blocked = 349
- sgsn-attach-on-inbound-irau = 350
- sgsn-attach-on-outbound-irau = 351
- sgsn-incorrect-state = 352
- sgsn-t3350-expiry = 353
- sgsn-page-timer-expiry = 354
- phsgw-tid-entry-not-found = 355
- phspc-del-ms-entry-recd = 356
- sgsn-pdp-local-purge = 357
- phs-invalid-nai = 358
- session-sleep-mode-exit-timeout = 359
- sgsn-offload-phase2 = 360
- phs-thirdparty-auth-fail = 361
- remote-error-notify = 362
- no-response = 363
- PDG-Auth-failed = 364
- mme-s1AP-send-failed=365
- mme-egtpc-connection-failed=366
- mme-egtpc-create-session-failed=367
- mme-authentication-failure=368
- mme-ue-detach=369
- mme-mme-detach=370
- mme-hss-detach=371
- mme-pgw-detach=372
- mme-sub-validation-failure=373
- mme-hss-connection-failure=374
- mme-hss-user-unknown=375
- dhcp-lease-mismatch-detected=376

- nemo-link-layer-down=377
- eapol-max-retry-reached = 378
- sgsn-offload-phase3 = 379
- mbms-bearer-service-disconnect = 380
- disconnect-on-violation-odb = 381
- disconn-on-violation-focs-odb = 382
- CSCF-REG-Admin-disconnect = 383
- CSCF-REG-User-disconnect = 384
- CSCF-REG-Inactivity-timeout = 385
- CSCF-REG-Network-disconnect = 386
- CSCF-Call-Admin-disconnect = 387
- CSCF-CALL-User-disconnect = 388
- CSCF-CALL-Local-disconnect = 389
- CSCF-CALL-No-Resource = 390
- CSCF-CALL-No-Respone = 391
- CSCF-CALL-Inactivity-timeout = 392
- CSCF-CALL-Media-Auth-Failure = 393
- CSCF-REG-No-Resource = 394
- ms-unexpected-idle-mode-entry = 395
- re-auth-failed = 396
- sgsn-pdp-nse-cleanup = 397
- sgsn-mm-ctxt-gtp-no-resource = 398
- unknown-apn = 399
- gtpc-path-failure = 400
- gtpu-path-failure = 401
- actv-rejected-by-sgsn = 402
- sgsn-pdp-gprs-camel-release = 403
- sgsn-check-imei-failure = 404
- sgsn-sndcp-init-deact = 405
- sgsn-pdp-inactivity-timeout = 406
- fw-and-nat-policy-removed = 407
- FNG-Auth-failed = 408
- ha-stale-key-disconnect = 409
- No-IPV6-address-for-subscriber = 410
- prefix-registration-failure = 411
- disconnect-from-policy-server = 412
- s6b-auth-failed = 413

## ■ Attributes

- gtpc-err-ind = 414
- gtpu-err-ind = 415
- invalid-pdn-type = 416
- aaa-auth-req-failed = 417
- apn-denied-no-subscription = 418
- Sgw-context-replacement = 419
- dup-static-ip-addr-req = 420
- apn-restrict-violation = 421
- invalid-wapn = 422
- ttg-nsapi-allocation-failed = 423
- mandatory-gtp-ie-missing = 424
- aaa-unreachable = 425
- asngw-service-flow-deletion = 426
- CT-PMIP-RRQ-NVSE-Value-Change = 427
- tcp-read-failed = 428
- tcp-write-failed = 429
- ssl-handshake-failed = 430
- ssl-renegotiate-failed = 431
- ssl-bad-message = 432
- ssl-alert-received = 433
- ssl-disconnect = 434
- ssl-migration = 435
- sgsn-ard-failure = 436
- sgsn-camel-release = 437
- Hotlining-Status-Change=447
- ggsn-no-rsp-from-sgsn = 448
- diameter-protocol-error=449
- diameter-request-timeout=450
- operator-policy=451
- spr-connection-timeout=452
- miph-a-dup-wimax-session = 453
- invalid-version-attr = 454
- sgsn-zone-code-failure = 455
- invalid-qci = 456
- no\_rules = 457
- mme-init-ctxt-setup-failure = 459
- mme-driver-initiated = 460

- mme-s1ap-connection-down = 461
- mme-s1ap-reset-recd = 462
- mme-s6a-response-timeout = 463
- mme-s13-response-timeout = 464
- mme-Illegal-equipment = 465
- mme-unexpected-attach = 466
- mme-sgw-selection-failure = 467
- mme-pgw-selection-failure = 468
- mme-reselection-to-sgsn = 469
- mme-relocation-to-sgsn = 470
- mme-reselection-to-mme = 471
- mme-relocation-to-mme = 472
- mme-tau-attach-collision = 473
- mme-old-sgsn-resolution-failure = 474
- mme-old-mme-resolution-failure = 475
- mme-reloc-ho-notify-timeout = 476
- mme-reloc-ho-req-ack-timeout = 477
- mme-create-session-timeout = 478
- mme-create-session-failure = 479
- mme-s11-path-failure = 480
- mme-policy-no-ue-irat = 481
- mme-x2-handover-failed = 482
- mme-attach-restrict = 483
- mme-regional-zone-code = 484
- mme-no-response-from-ue = 485
- mme-sgw-relocation-failed = 486
- mme-implicit-detach = 487
- sgsn-detach-notify = 488
- policy-initiated-release = 489

---

## SN-DNS-Proxy-Intercept-List

This attribute is used to specify the list name which contains the rules to intercept and redirect DNS requires received from mobile. This attribute can be configured using either local subscriber template or returned from Access-Accept.

**Type**

26

**Vendor ID**

8164

## ■ Attributes

**VSA Type**  
214

**Length**  
1–253

**Value**  
ASCII string

## SN-DNS-Proxy-Use-Subscr-Addr

This attribute is used to convey whether to use the subscriber's address as the source address for DNS Proxy.

**Type**  
26

**Vendor ID**  
8164

**VSA Type**  
25

**Length**  
4

**Value**  
Enumerated integer. Supported values are:

- Disable = 0
- Enable = 1

## SN-Dynamic-Addr-Alloc-Ind-Flag

This attribute indicates whether the IP address is allocated statically or dynamically from SGW perspective.

**Type**  
26

**Vendor ID**  
8164

**VSA Type**  
141

**Length**  
1

**Value**  
Opaque value

## SN-Ecs-Data-Volume

Compound attribute indicating downlink and uplink octet usage for a PDP context per rating group.

**Type**

26

**Vendor ID**

8164

**VSA Type**

176

**Length**

12

**Value**

Contains the following subattributes:

---

**Rating-Group-Id**

Rating Group Id in a PDP context.

**Type**

1

**Length**

4

**Value**

Unsigned integer

---

**GPRS-Uplink**

Uplink octet usage for a PDP context per rating group.

**Type**

2

**Length**

4

**Value**

Unsigned integer

---

**GPRS-Downlink**

Downlink octet usage for a PDP context per rating group.

**Type**

3

**Length**

4

**Value**

Unsigned integer

---

**SN-Enable-QoS-Renegotiation**

This attribute configures the enabling of dynamic QoS renegotiation.

## ■ Attributes

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	144
<b>Length</b>	4
<b>Value</b>	<p>Enumerated integer. Supported values are:</p> <ul style="list-style-type: none"> <li>• No = 0</li> <li>• Yes = 1</li> </ul>

**SN-Event**

This attribute contains the type of SIP event for which the accounting-request message is generated.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	255
<b>Length</b>	4
<b>Value</b>	ASCII string

**SN-Ext-Inline-Srvr-Context**

This attribute configures the context name in which the External In-line server resides.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	41
<b>Length</b>	1–247
<b>Value</b>	String



**Important:** This attribute is used in conjunction with the External In-line Server feature, which is not supported in StarOS 9.0 and later releases.

---

## SN-Ext-Inline-Srvr-Down-Addr

This attribute configures the IP address of the Downstream External In-line server to forward VLAN-tagged packets to. It can be tagged, in which case it is treated as part of an external in-line server group.

**Type**

26

**Vendor ID**

8164

**VSA Type**

56

**Length**

4

**Value**

IPv4 address



**Important:** This attribute is used in conjunction with the External In-line Server feature, which is not supported in StarOS 9.0 and later releases.

---

## SN-Ext-Inline-Srvr-Down-VLAN

This attribute configures the IP address of the Downstream External In-line server to forward VLAN-tagged packets to. It can be tagged, in which case it is treated as part of an external in-line server group.

**Type**

26

**Vendor ID**

8164

**VSA Type**

59

**Length**

4

**Value**

The VLAN tag to apply.



**Important:** This attribute is used in conjunction with the External In-line Server feature, which is not supported in StarOS 9.0 and later releases.

## SN-Ext-Inline-Srvr-Preference

This attribute configures the preference for the tagged group of External In-line Servers. This attribute is required, although it doesn't actually assign a preference right now. It can be tagged, in which case it is treated as part of an external in-line server group.

**Type**

26

**Vendor ID**

8164

**VSA Type**

57

**Length**

4

**Value**

Unsigned integer



**Important:** This attribute is used in conjunction with the External In-line Server feature, which is not supported in StarOS 9.0 and later releases.

## SN-Ext-Inline-Srvr-Up-Addr

This attribute configures the IP address of the Upstream External In-line server to forward VLAN-tagged packets to. It can be tagged, in which case it is treated as part of an external in-line server group

**Type**

26

**Vendor ID**

8164

**VSA Type**

55

**Length**

4

**Value**

IPv4 address



**Important:** This attribute is used in conjunction with the External In-line Server feature, which is not supported in StarOS 9.0 and later releases.

## SN-Ext-Inline-Srvr-Up-VLAN

This attribute configures the VLAN tag to be applied to Upstream packets and forwarded to the External In-line server. It can be tagged, in which case it is treated as part of an external in-line server group.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	58
<b>Length</b>	4
<b>Value</b>	The VLAN tag to apply.



**Important:** This attribute is used in conjunction with the External In-line Server feature, which is not supported in StarOS 9.0 and later releases.

---

## SN-Fast-Reauth-Username

Fast re-authentication user name.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	304
<b>Length</b>	1–128
<b>Value</b>	Opaque value

---

## SN-Firewall-Enabled

Firewall for subscriber enabled.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	198
<b>Length</b>	4
<b>Value</b>	Enumerated integer. Supported values are:

**■ Attributes**

- False = 0
- True = 1

---

## SN-Firewall-Policy

This attribute contains the firewall policy name.



**Important:** This AVP was deprecated in StarOS 8.0, and was later reintroduced in StarOS 8.1.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

If this AVP is present in Access Accept message the locally configured APN value will be overridden. If there is no value configured in the APN this policy will not be applied.

**Type**

26

**Vendor ID**

8164

**VSA Type**

239

**Length**

1–63

**Value**

String

---

## SN-FMC-Location

MAC address and CDMA location information.

**Type**

26

**Vendor ID**

8164

**VSA Type**

171

**Length**

1–247

**Value**

String

---

## SN-GGSN-Address

The control plane IP address of the GGSN that handles one or more media component(s) of an IMS session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

264

**Length**

4

**Value**

IPv4 address

## SN-GGSN-MIP-Required

This attribute specifies if MIP is required for the GGSN subscriber.

**Type**

26

**Vendor ID**

8164

**VSA Type**

68

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0
- Enabled = 1

## SN-Gratuitous-ARP-Aggressive

This attribute specifies whether to generate a gratuitous ARP message whenever a MIP handoff or re-registration occurs. A non-zero of this attribute also configures the mode of operation when sending the gratuitous ARP, although only one mode (Aggressive) is supported at this time.

**Type**

26

**Vendor ID**

8164

**VSA Type**

54

**Length**

4

**Value**

Enumerated integer. Supported values are:

**■ Attributes**

- Disabled = 0 — Do not send Gratuitous ARP
- Enabled = 1 — Send Gratuitous ARP in Aggressive mode

---

## SN-GTP-Version

This attribute indicates the version of GTP the subscriber is using.

**Type**

26

**Vendor ID**

8164

**VSA Type**

62

**Length**

4

**Value**

Enumerated integer. Supported values are:

- GTP\_VERSION\_0 = 0
- GTP\_VERSION\_1 = 1
- GTP\_VERSION\_2 = 2

---

## SN-HA-Send-DNS-ADDRESS

This attribute specifies if the HA should send the DNS address in the Mobile IP RRP message. The default is not to send the DNS address.

**Type**

26

**Vendor ID**

8164

**VSA Type**

47

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0 — Do not send
- Enabled = 1 — Send

---

## SN-Handoff-Indicator

This attribute indicates whether the Accounting Interim is sent because of the interim or not.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	310
<b>Length</b>	1
<b>Value</b>	<p>Enumerated integer. Supported values are:</p> <ul style="list-style-type: none"> <li>• Active-Handoff = 0</li> <li>• Location-Update = 1</li> </ul>

---

## SN-Home-Behavior

This attribute specifies the configuration for the behavior bits settings for a home subscriber in an APN.

When GGSN is configured to reject the charging characteristics sent by the SGSN for “home” subscribers, it uses the profile index specified by **cc-home behavior <bits> profile <index>** command to determine the appropriate CCs to use.

Multiple behavior bits can be configured for a single profile index by “Or”ing the bit strings together and convert the result to hexadecimal. The properties of the actual CC profile index are configured as part of the GGSN service using the cc profile command.

If this AVP is present in Access Accept message the locally configured APN value will be overridden.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	119
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## SN-Home-Profile

This attribute specifies the configuration for the profile bits settings for a home subscriber in an APN.

If this AVP is present in Access Accept message the locally configured APN value will be overridden.

<b>Type</b>	26
<b>Vendor ID</b>	8164

## ■ Attributes

**VSA Type**  
109

**Length**  
4

**Value**  
Unsigned integer

## SN-Home-Sub-Use-GGSN

This attribute configures GGSN to accept GGSN's charging characteristics for home subscribers defined for the APN.

If this AVP is present in Access Accept message the locally configured APN value will be overridden.

**Type**  
26

**Vendor ID**  
8164

**VSA Type**  
106

**Length**  
4

**Value**  
Enumerated integer. Supported values are:

- Deny = 0
- Accept = 1

## SN-IMS-AM-Address

IMS application manager address.

**Type**  
26

**Vendor ID**  
8164

**VSA Type**  
167

**Length**  
4

**Value**  
IPv4 address

## SN-IMS-AM-Domain-Name

IMS application manager domain name.

---

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	168
<b>Length</b>	1–64
<b>Value</b>	String

---

## SN-IMS-Charging-Identifier

This attribute holds the IMS Charging Identifier (ICID) as generated by an IMS node for a SIP session.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	260
<b>Length</b>	4
<b>Value</b>	ASCII string

---

## SN-IMSI

SN-IMSI	
<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	252
<b>Length</b>	1–8
<b>Value</b>	Opaque value

---

## SN-Inactivity-Time

This attribute contains the inactivity time duration for a subscriber session under long time duration timer configuration.

**Type**

26

**Vendor ID**

8164

**VSA Type**

275

**Length**

4

**Value**

Integer

---

## SN-Internal-SM-Index

SN-Internal-SM-Index

**Type**

26

**Vendor ID**

8164

**VSA Type**

122

**Length**

4

**Value**

Unsigned integer

---

## SN-IP-Alloc-Method

This attribute specifies the method for allocating an IP address. This feature only applies to the GGSN service.

**Type**

26

**Vendor ID**

8164

**VSA Type**

53

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Alloc\_Local\_Pool = 0
- Alloc\_Dhcp\_Client = 1
- Alloc\_Radius = 2
- Alloc\_No\_Alloc = 3
- Alloc\_Static\_Alloc = 4
- Alloc\_Dhcp\_Relay = 5

## SN-IP-Filter-In

This attribute specifies the IP input filter rules to determine whether the traffic should undergo DPI processing.

If this AVP is present in Access Accept message the locally configured APN value will be overridden. If there is no value configured in the APN this value will not be applied to the session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

10

**Length**

1–253

**Value**

String

## SN-IP-Filter-Out

This attribute specifies the IP output filter rules to determine whether the traffic should undergo DPI processing.

If this AVP is present in Access Accept message the locally configured APN value will be overridden. If there is no value configured in the APN this value will not be applied to the session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

11

**Length**

1–253

**Value**

String

## SN-IP-Header-Compression

Specifies the IP header compression method to use.

**Type**

Type 26

**Vendor ID**

8164

**VSA Type**

150

**Length**

4

**Value**

Enumerated integer. Supported values are:

- None = 0
- VJ = 1
- ROHC = 2
- VJ\_ROHC = 3

## SN-IP-Hide-Service-Address

This attribute prevents subscribers from using traceroute to discover the public domain network addresses configured on HA and other services on the system.

**Type**

26

**Vendor ID**

8164

**VSA Type**

60

**Length**

4

**Value**

Enumerated integer. Supported values are:

- No = 0 — Disabled
- Yes = 1 — Enabled

## SN-IP-In-ACL

This attribute contains a definition for one Input IP Access Control List, which is used to filter the IP packets coming from the user. Note that more than one of these attributes can be included, in which case they are processed in the order in which they appear in the RADIUS Access-Accept.

**Type**

26

**Vendor ID**

8164

**VSA Type**

17

**Length**

1–253

**Value**

ASCII string

## SN-IP-In-Policy-Grp

This attribute specifies the name of the policy group configuration applied in the uplink direction.

**Type**

26

**Vendor ID**

8164

**VSA Type**

193

**Length**

1–15

**Value**

String

## SN-IP-Out-ACL

This attribute contains a definition for one Output IP Access Control List, which is used to filter the IP packets sent to the user. Note that more than one of these attributes can be included, in which case they are processed in the order in which they appear in the RADIUS Access-Accept.

**Type**

26

**Vendor ID**

8164

**VSA Type**

18

**Length**

1–253

**Value**

ASCII string

---

## SN-IP-Out-Pocy-Grp

This attribute specifies the name of the policy group configuration applied in the downlink direction.

**Type**

26

**Vendor ID**

8164

**VSA Type**

194

**Length**

1–15

**Value**

String

---

## SN-IP-Pool-Name

This vendor-specific attribute indicates the name of the IP pool from which an IP address should be allocated to the subscriber. Also, see **Framed-Pool**, which is the standard attribute accomplishing the same.

**Type**

26

**Vendor ID**

8164

**VSA Type**

8

**Length**

1–253

**Value**

ASCII string

---

## SN-IP-Source-Validation

This attribute indicates if the source IP address should be validated before forwarding the IP packet.

**Type**

26

**Vendor ID**

8164

**VSA Type**

14

**Length**

4

**Value**

Enumerated integer. Supported values are:

- No = 0 — No Validation
- Yes = 1 — Validated

---

## SN-IP-Source-Violate-No-Acct

This attribute excludes the Source Violated IP packets and byte counts when reporting the Octet and Packet count in an accounting message.

If this AVP is present in Access Accept message the locally configured APN value will be overridden. If there is no value configured in the APN this value will not be applied to the session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

196

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0
- Enabled = 1

---

## SN-IP-Src-Validation-Drop-Limit

Maximum number of packet drops entertained before disconnecting the session for source violated packets for the session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

110

**Length**

4

**Value**

Unsigned integer

---

## SN-IPv6-DNS-Proxy

IPV6 DNS proxy enabled or disabled setting for the session.

**Type**

26

## ■ Attributes

<b>Vendor ID</b>	8164
<b>VSA Type</b>	126
<b>Length</b>	4
<b>Value</b>	<p>Enumerated integer. Supported values are:</p> <ul style="list-style-type: none"> <li>• Disabled = 0</li> <li>• Enabled = 1</li> </ul>

---

## SN-IPv6-Egress-Filtering

This attribute enables egress filtering to make sure that packets being sent to the mobile device have an interface ID that matches that of the mobile device. This feature is meant to protect the Mobile from receiving unwanted packets from the Internet.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	103
<b>Length</b>	4
<b>Value</b>	<p>Enumerated integer. Supported values are:</p> <ul style="list-style-type: none"> <li>• Disabled = 0</li> <li>• Enabled = 1</li> </ul>

---

## SN-IPv6-Min-Link-MTU

IPV6 MTU size.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	136
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## SN-IPv6-num-rtr-advt

This attribute indicates the IPv6 number of Initial Router Advertisements. The default value is 3.

**Type**

26

**Vendor ID**

8164

**VSA Type**

97

**Length**

4

**Value**

Unsigned integer

---

## SN-IPv6-Primary-DNS

This attribute specifies a Primary DNS server address that the Router Advertisement message sent by the PDSN will include.

**Type**

26

**Vendor ID**

8164

**VSA Type**

101

**Length**

2

**Value**

IPv6 address

---

## SN-IPv6-rtr-advt-interval

This attribute indicates the IPv6 Initial Router Advertisement Interval specified in milliseconds. The default value is 3000.

**Type**

26

**Vendor ID**

8164

**VSA Type**

96

**Length**

4

**Value**

Unsigned integer

---

## SN-IPv6-Secondary-DNS

This attribute specifies a Secondary DNS server address that the Router Advertisement message sent by the PDSN will include.

**Type**

26

**Vendor ID**

8164

**VSA Type**

102

**Length**

16

**Value**

Opaque value

---

## SN-IPv6-Sec-Pool

IPv6 secondary pool names.

**Type**

26

**Vendor ID**

8164

**VSA Type**

124

**Length**

1–253

**Value**

String

---

## SN-IPv6-Sec-Prefix

IPv6 Secondary Pool name prefix.

**Type**

26

**Vendor ID**

8164

**VSA Type**

125

**Length**

2–18

**Value**

Opaque value

---

## SN-ISC-Template-Name

This attribute contains name of the CSCF ISC template to be used for a subscriber.

**Type**

26

**Vendor ID**

8164

**VSA Type**

276

**Length**

0-255

**Value**

ASCII string

---

## SN-Is-Unregistered-Subscriber

This attribute specifies if a subscriber is registered or not.

**Type**

26

**Vendor ID**

8164

**VSA Type**

269

**Length**

4

**Value**

ASCII string

---

## SN-L3-to-L2-Tun-Addr-Policy

This attribute specifies the address allocation policy.

**Type**

26

**Vendor ID**

8164

**VSA Type**

43

**Length**

4

**Value**

Enumerated integer. Supported values are:

**■ Attributes**

- no-local-alloc-validate = 0 — Do not locally allocate, do not validate
- local-alloc = 1 — Locally allocate
- local-alloc-validate = 2 — Locally allocate and validate

---

## SN-Local-IP-Address

This attribute indicates the IP address of the local interface on the chassis for the user's session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

13

**Length**

4

**Value**

IPv4 address

---

## SN-Long-Duration-Action

This attribute specifies the action to take place when the long duration timeout expires for a subscriber session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

45

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Detection = 1 — Detect the session and alert the administrator
- Disconnection = 2 — Disconnect the session
- Dormant-Only-Disconnection = 3
- Dormant-Only-Detection = 4

---

## SN-Long-Duration-Notification

SN-Long-Duration-Notification.

**Type**

26

**Vendor ID**

8164

**VSA Type**

253

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Suppress = 0
- Send = 1

## SN-Long-Duration-Timeout

This attribute is used to detect and if necessary disconnect sessions connected to the PDSN. This attribute configures the time period, in seconds, before either alerting the administrator or disconnecting the subscriber.

**Type**

26

**Vendor ID**

8164

**VSA Type**

44

**Length**

4

**Value**

Integer

## SN-Max-Sec-Contexts-Per-Subs

Maximum secondary PDP contexts per subscriber.

**Type**

26

**Vendor ID**

8164

**VSA Type**

290

**Length**

2

**Value**

Unsigned integer

## SN-Mediation-Acct-Rsp-Action

When this attribute is set to **None**, there is no action taken while waiting for a response for the accounting start message from the Mediation Accounting server. When this attribute is set to **No-Early-PDUs** the system buffers all packets from the user (uplink) until a response for the accounting start message is received from the Mediation Accounting server. When set to **Delay\_GTP\_Response**, the system does not send a GTP create PDP response to the GGSN until a response for the accounting start message is received from the Mediation Accounting server. If the AVP is not present in Access Accept message or if the AVP value is invalid, the value “**None**” is assumed.

**Type**

26

**Vendor ID**

8164

**VSA Type**

105

**Length**

4

**Value**

Enumerated integer. Supported values are:

- None = 0
- No\_Early\_PDUs = 1
- Delay\_GTP\_Response = 2

## SN-Mediation-Enabled

This attribute indicates whether the Mediation Accounting configuration is enabled or disabled for GGSN.

If this AVP is not present in Access Accept message or if the AVP value is invalid, the locally configured APN value will be used.

**Type**

26

**Vendor ID**

8164

**VSA Type**

123

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0
- Enabled = 1

---

## SN-Mediation-No-Interims

This attribute is used to disable or enable Mediation Interim Accounting Records for the session.

If this AVP is not present in Access Accept message or if the AVP value is invalid, the locally configured APN value will be used.

**Type**

26

**Vendor ID**

8164

**VSA Type**

146

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0
- Enabled = 1

---

## SN-Mediation-VPN-Name

This attribute specifies the Mediation Context name for the session.

If this AVP is not received in the Access Accept message or if the AVP value is invalid, the locally configured APN value will be used.

**Type**

26

**Vendor ID**

8164

**VSA Type**

104

**Length**

1–128

**Value**

String

---

## SN-Min-Compress-Size

This attribute specifies the minimum size (in octets) a data packet can have in order to be compressed.

**Type**

26

**Vendor ID**

8164

## ■ Attributes

**VSA Type**

23

**Length**

4

**Value**

Unsigned integer

---

## SN-MIP-AAA-Assign-Addr

This attribute specifies if the PDSN/FA will allow AAA to assign the home address. The default is to not allow AAA to assign the home address.

**Type**

26

**Vendor ID**

8164

**VSA Type**

50

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0 — Do not allow AAA to assign home address
- Enabled = 1 — Allow AAA to assign home address

---

## SN-MIP-ANCID

Accounting correlation ID created by IPGW, received by VBM and HBM.

**Type**

26

**Vendor ID**

8164

**VSA Type**

166

**Length**

12

**Value**

Opaque value

---

## SN-MIP-Dual-Anchor

Enable/disable dual-anchor service for a subscriber.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	165
<b>Length</b>	4
<b>Value</b>	<p>Enumerated integer. Supported values are:</p> <ul style="list-style-type: none"> <li>• Disabled = 0</li> <li>• Enabled = 1</li> </ul>

---

## SN-MIP-HA-Assignment-Table

MIP-HA Assignment Table name. When this is received in an Access Accept message, the system uses this local table to get the HA Address.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	154
<b>Length</b>	1–253
<b>Value</b>	ASCII string

---

## SN-MIP-Match-AAA-Assign-Addr

This attribute specifies if the PDSN/FA will enforce that a non-zero AAA-specified home address must match the home address present in the MIP RRQ from the mobile node, and disconnect the subscriber session if a match is not present. The default is not to force the addresses to match.

**Type**

26

**Vendor ID**

8164

**VSA Type**

51

**Length**

4

**Value**

## ■ Attributes

Enumerated integer. Supported values are:

- Disabled = 0 — Do not force the AAA-specified home address to match RRQ
- Enabled = 1 — Force the AAA-specified home address to match RRQ

---

## SN-MIP-Reg-Lifetime-Realm

Configure the maximum MIP registration lifetime for a subscriber/realm.

**Type**

26

**Vendor ID**

8164

**VSA Type**

175

**Length**

2

**Value**

Unsigned integer

---

## SN-MIP-Send-Ancid

This attribute enables/disables sending ANCID from FA to HA in MIP RRQ.

**Type**

26

**Vendor ID**

8164

**VSA Type**

163

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0
- Enabled = 1

---

## SN-MIP-Send-Correlation-Info

This attribute enables/disables sending of correlation-id from FA to HA in MIP RRQ.

**Type**

26

**Vendor ID**

8164

**VSA Type**

188

**Length**

4

**Value**

Enumerated integer. In StarOS 8.1 and earlier, supported values are:

- Disabled = 0
- Enabled = 1

In StarOS 8.3 and later, supported values are:

- Disabled = 0
- NVSE\_Starent = 1
- NVSE\_Custom1 = 2
- NVSE\_Custom2 = 3

## SN-MIP-Send-Host-Config

This attribute is used to enable/disable Host Config Extension in MIP RRQ.

**Type**

26

**Vendor ID**

8164

**VSA Type**

311

**Length**

1

**Value**

Enumerated integer. Supported values are:

- Disabled = 0
- Enabled = 1

## SN-MIP-Send-Imsi

AAA attribute to enable/disable sending IMSI from FA to HA in MIP RRQ.

**Type**

26

**Vendor ID**

8164

**VSA Type**

164

**■ Attributes****Length**

4

**Value**

Enumerated integer. In StarOS and 8.1 and earlier, supported values are:

- None = 0
- Starent\_NVSE = 1
- Custom1\_NVSE = 2

In StarOS 8.3 and later, supported values are:

- Disabled = 0
- NVSE\_Starent = 1
- NVSE\_Custom1 = 2
- NVSE\_Custom2 = 3

## SN-MIP-Send-Term-Verification

This attribute specifies whether the PDSN/FA should send the Terminal Verification Normal Vendor/Organization Specific Extension (NVSE) in the Mobile IP RRQ message to the HA. The default is not to send the Terminal Verification NVSE.

**Type**

26

**Vendor ID**

8164

**VSA Type**

48

**Length**

4

**Value**

Enumerated integer. In StarOS 8.1 and earlier, supported values are:

- Disabled = 0 — Do not send
- Enabled = 1 — Send

In StarOS 8.3 and later, supported values are:

- Disabled = 0
- NVSE\_Custom1 = 1 — Send custom NVSE
- NVSE\_Custom2 = 2 — Send custom NVSE
- NVSE\_Starent = 3 — Send custom NVSE

## SN-MN-HA-Hash-Algorithm

This attribute contains the hash algorithm to use for MN-HA authentication.

**Type**

26

<b>Vendor ID</b>	8164
<b>VSA Type</b>	99
<b>Length</b>	4
<b>Value</b>	<p>Enumerated integer. Supported values are:</p> <ul style="list-style-type: none"> <li>• MD5 = 1</li> <li>• MD5-RFC2002 = 2</li> <li>• HMAC-MD5 = 3</li> </ul>

---

## SN-MN-HA-Timestamp-Tolerance

This attribute indicates the duration of timestamp tolerance, in seconds, to use for MN-HA authentication.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	30
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## SN-Mode

Robust Header Compression (ROHC) Mode. Reliable mode means each ROHC control needs to be Acknowledged. Optimistic mode is a modified version to reduce the number of control messages and bandwidth consumption. Unidirectional assumes a one way link without any Feedback from the decompressor.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	151
<b>Length</b>	4
<b>Value</b>	<p>Enumerated integer. Supported values are:</p> <ul style="list-style-type: none"> <li>• Reliable = 0</li> </ul>

**■ Attributes**

- Optimistic = 1
- Unidirectional = 2

---

## SN-MS-ISDN

SN-MS-ISDN.

**Type**

26

**Vendor ID**

8164

**VSA Type**

248

**Length**

1–9

**Value**

Opaque value

---

## SN-MSK-Lifetime

This attribute is currently not supported.

---

## SN-NAI-Construction-Domain

This attribute specifies the domain name to use when constructing the NAI.

**Type**

26

**Vendor ID**

8164

**VSA Type**

37

**Length**

1–247

**Value**

String

---

## SN-NAT-IP-Address

This attribute includes the NAT (public) IP address used for the call.

This attribute is also accepted in CoA request and response messages to be used in a currently active subscriber session.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	297
<b>Length</b>	4
<b>Value</b>	IPv4 address

---

## SN-Node-Functionality

This attribute includes the functionality identifier of the IMS node where the cause code was generated.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	268
<b>Length</b>	4
<b>Value</b>	Enumerated integer. Supported values are: <ul style="list-style-type: none"> <li>• S-CSCF = 0</li> <li>• P-CSCF = 1</li> <li>• I-CSCF = 2</li> </ul>

---

## SN-NPU-Qos-Priority

This attribute configures Inter-Subscriber priority Queueing based on class of service offered. Gold has highest priority and Best\_effort lowest priority. From DSCP, means the priority queueing will be done based on the DSCP marking the incoming subscriber packet carries.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	98
<b>Length</b>	4

## ■ Attributes

**Value**

Enumerated integer. Supported values are:

- Best\_Effort = 0
- Bronze = 1
- Silver = 2
- Gold = 3
- From\_DSCP = 4

## SN-Ntk-Initiated-Ctx-Ind-Flag

Indicates whether the GGSN call is a network initiated PDP Context.

**Type**

26

**Vendor ID**

8164

**VSA Type**

142

**Length**

1

**Value**

Opaque value

## SN-Ntk-Session-Disconnect-Flag

SN-Ntk-Session-Disconnect-Flag.

**Type**

26

**Vendor ID**

8164

**VSA Type**

143

**Length**

4

**Value**

Enumerated integer. Supported value is:

- Session-Disconnect = 1

## SN-Nw-Reachability-Server-Name

This attribute specifies the name of the Network Reachability Detection Server.

---

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	65
<b>Length</b>	1–16
<b>Value</b>	String

---

## SN-Originating-IOI

This attribute holds the Inter Operator Identifier for the originating network in the home network of the originating end user.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	261
<b>Length</b>	1–253
<b>Value</b>	ASCII string

---

## SN-Overload-Disc-Connect-Time

This attribute provides inactivity time for session to become candidate for disconnection during overload.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	233
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## SN-Overload-Disc-Inact-Time

This attribute provides inactivity time for session to become candidate for disconnection during overload.

**Type**

26

**Vendor ID**

8164

**VSA Type**

234

**Length**

4

**Value**

Unsigned integer

---

## SN-Overload-Disconnect

This attribute enables (if one) and disables the overload-disconnect feature for a subscriber.

**Type**

26

**Vendor ID**

8164

**VSA Type**

235

**Length**

4

**Value**

Unsigned integer

---

## SN-PDG-TTG-Required

TTG mode of operation Required for PDG.

**Type**

26

**Vendor ID**

8164

**VSA Type**

299

**Length**

1

**Value**

Enumerated integer. Supported values are:

- No = 0
- Yes = 1

---

## SN-PDIF-MIP-Release-TIA

PDIF mobile IP release TIA.

**Type**

26

**Vendor ID**

8164

**VSA Type**

172

**Length**

4

**Value**

Enumerated integer. Supported values are:

- No = 0
- Yes = 1

---

## SN-PDIF-MIP-Required

PDIF mobile IP required.

**Type**

26

**Vendor ID**

8164

**VSA Type**

170

**Length**

4

**Value**

Enumerated integer. Supported values are:

- No = 0
- Yes = 1

---

## SN-PDIF-MIP-Simple-IP-Fallback

PDIF mobile IP simple IP fallback.

**Type**

26

## ■ Attributes

<b>Vendor ID</b>	8164
<b>VSA Type</b>	173
<b>Length</b>	4
<b>Value</b>	<p>Enumerated integer. Supported values are:</p> <ul style="list-style-type: none"> <li>• No = 0</li> <li>• Yes = 1</li> </ul>

---

## SN-PDSN-Correlation-Id

Correlation ID received from PDSN to HA.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	189
<b>Length</b>	8
<b>Value</b>	Opaque value

---

## SN-PDSN-Handoff-Req-IP-Addr

This attribute specifies if the PDSN should reject and terminate the subscriber session when the proposed address in IPCP by the mobile does not match the existing address in the PDSN. The default (Disabled) is not to reject these sessions.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	46
<b>Length</b>	4
<b>Value</b>	<p>Enumerated integer. Supported values are:</p> <ul style="list-style-type: none"> <li>• Disabled = 0 — Do not reject</li> <li>• Enabled = 1 — Reject</li> </ul>

---

## SN-PDSN-NAS-Id

NAS Identifier received from PDSN to HA

**Type**  
26

**Vendor ID**  
8164

**VSA Type**  
190

**Length**  
1–253

**Value**  
String

---

## SN-PDSN-NAS-IP-Address

NAS IP address received from PDSN to HA.

**Type**  
26

**Vendor ID**  
8164

**VSA Type**  
191

**Length**  
4

**Value**  
IPv4 address

---

## SN-Permit-User-Mcast-PDUs

Specifies whether or not to let the subscriber discard multicast PDUs.

**Type**  
26

**Vendor ID**  
8164

**VSA Type**  
134

**Length**  
2

**Value**  
Enumerated integer. Supported values are:

## ■ Attributes

- disabled = 0
- enabled = 1

---

## SN-PPP-Accept-Peer-v6Ifid

This attribute indicates the acceptance of the interface ID provided by peer during PPP IPv6CP if the ID is valid. The default is disabled.

**Type**

26

**Vendor ID**

8164

**VSA Type**

95

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0 — Do not accept interface ID
- Enabled = 1 — Accept interface ID

---

## SN-PPP-Always-On-Vse

SN-PPP-Always-On-Vse.

**Type**

26

**Vendor ID**

8164

**VSA Type**

130

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0
- Enabled = 1

---

## SN-PPP-Data-Compression

This attribute indicates the PPP data compression algorithm to use for the PPP session. The attribute value is a bit field, and many algorithms can be specified to indicate that one of these may be chosen by the user.

**Type**

26

**Vendor ID**

8164

**VSA Type**

9

**Length**

4

**Value**

Enumerated integer. Supported values are:

- None = 0
- Stac-LZS = 1
- MPPC = 2
- Deflate = 4

## SN-PPP-Data-Compression-Mode

This attribute indicates the PPP data compression mode to use for the PPP session when PPP data compression is used.

**Type**

26

**Vendor ID**

8164

**VSA Type**

19

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Normal = 0
- Stateless = 1

## SN-PPP-Keepalive

This attribute indicates the interval for the PPP keepalive, in seconds.

**Type**

26

**Vendor ID**

8164

**VSA Type**

16

**Length**

4

## ■ Attributes

**Value**

Unsigned integer

---

## SN-PPP-NW-Layer-IPv4

This attribute indicates the PPP IPCP negotiation for IPv4. The default is enabled.

**Type**

26

**Vendor ID**

8164

**VSA Type**

92

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0 — IPCP negotiation for IPv4 is disabled.
- Enabled = 1 — IPCP negotiation for IPv4 is enabled.
- Passive = 2 — Start the negotiation only if peer initiates it.

---

## SN-PPP-NW-Layer-IPv6

This attribute indicates the PPP IPv6CP negotiation for IPv6. The default is enabled.

**Type**

26

**Vendor ID**

8164

**VSA Type**

93

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0 — IPCP negotiation for IPv6 is disabled.
- Enabled = 1 — IPCP negotiation for IPv6 is enabled.
- Passive = 2 — Start the negotiation only if peer initiates it.

---

## SN-PPP-Outbound-Password

This attribute indicates the password to be used when the user side of the PPP connection requires authentication.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	15
<b>Length</b>	1–247
<b>Value</b>	ASCII string

---

## SN-PPP-Outbound-Username

This attribute indicates the username to be used when the user side of the PPP connection requires authentication.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	61
<b>Length</b>	1–247
<b>Value</b>	ASCII string

---

## SN-PPP-Progress-Code

This attribute provides information about the “state” of the PPP connection, when the connection was terminated.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	4
<b>Length</b>	4
<b>Value</b>	Enumerated integer. Supported values are: <ul style="list-style-type: none"> <li>Not-Defined = 0</li> <li>Call-Lcp-Down = 10</li> <li>Call-Disconnecting = 20</li> </ul>

- Call-Ppp-Renegotiating = 30
- Call-Arrived = 40
- Call-Pdg-Tcp-Connecting = 45
- Call-Pdg-Ssl-Connecting = 46
- Call-Lcp-Up = 50
- Call-Authenticating = 60
- Call-Bcmcs-Authenticating = 70
- Call-Authenticated = 80
- Call-Tunnel-Connecting = 85
- Call-Ipcp-Up = 90
- Call-Imsa-Authorizing = 95
- Call-Imsa-Authorized = 97
- Call-MBMS-UE-Authorizing = 98
- Call-MBMS-Bearer-Authorizing = 99
- Call-Simple-IP-Connected = 100
- Call-Mobile-IP-Connected = 110
- Call-Tunnel-Connected = 115
- Call-Pdp-Type-IP-Connected = 120
- Call-Pdp-Type-IPv6-Connected = 125
- Call-Pdp-Type-PPP-Connected = 130
- Call-Proxy-Mobile-IP-Connected = 140
- Call-Pdg-Connected = 142
- Call-Pdg-Ssl-Connected = 141
- Call-Pdg-Connected = 142
- Call-Pdg-Connected = 142
- Call-Ipsg-Connected = 145
- Call-Bcmcs-Connected = 150
- Call-MBMS-UE-Connected = 155
- Call-MBMS-Bearer-Connected = 156
- Call-Pending-Addr-From-DHCP = 160
- Call-Got-Addr-From-DHCP = 170
- Call-HA-IPSEC-Tunnel-Connecting = 180
- Call-HA-IPSEC-Connected = 190
- Call-ASN-Non-Anchor-Connected = 200
- Call-ASN-PC-Connected = 210
- Call-Mobile-IPv6-Connected = 220
- Call-PMIPv6-Connected = 221

- Call-PHSPC-Connected = 230
- Call-GTP-IPv4-Connected = 235
- Call-GTP-IPv6-Connected = 236
- Call-GTP-IPv4-IPv6-Connected = 237
- Call-SGW-Connected = 245
- Call-MME-Attached = 246
- Call-Auth-Only-Connected = 247

---

## SN-PPP-Reneg-Disc

PPP remote renegotiate disconnect policy

**Type**

26

**Vendor ID**

8164

**VSA Type**

187

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Never = 0
- Always = 1
- NAI\_Prefix\_MSID\_Mismatch = 2

---

## SN-Prepaid

Prepaid

**Type**

26

**Vendor ID**

8164

**VSA Type**

128

**Length**

4

**Value**

Enumerated integer. Supported values are:

- no\_prepaid = 0
- custom\_prepaid = 1

## ■ Attributes

- standard\_prepaid = 2
- wimax\_prepaid = 4

---

## SN-Prepaid-Compressed-Count

This attribute indicates if a Pre-paid subscriber's byte usage should be counted on the basis of compressed or uncompressed byte data over the subscriber's PPP connection to the system. If not present, the default is to count uncompressed byte data.

**Type**

26

**Vendor ID**

8164

**VSA Type**

31

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Uncompressed = 0
- Compressed = 1

---

## SN-Prepaid-Final-Duration-Alg

For prepaid, final duration is calculated based on the algorithm specified by the value of this attribute.

If this AVP is not received in the Access Accept message or if the AVP value is invalid, the locally configured APN value will be used.

**Type**

26

**Vendor ID**

8164

**VSA Type**

135

**Length**

4

**Value**

Enumerated integer. Supported values are:

- current\_time = 0
- last-user-layer3-activity-time = 1
- last-airlink-activity-time = 2
- last-airlink-activity-time-last-reported = 3

---

## SN-Prepaid-Inbound-Octets

In an Access-Accept, this indicates how many additional inbound (bytes delivered to the subscriber) byte credits should be granted to the subscriber. In an Accounting- Request, this indicates how many total inbound byte credits have been granted to the subscriber. When this attribute is not present in the Access-Accept, then pre-paid usage checking is disabled on an inbound octet basis.

**Type** 26  
**Vendor ID** 8164  
**VSA Type** 32  
**Length** 4  
**Value** Unsigned integer

---

## SN-Prepaid-Outbound-Octets

**Type** 26  
**Vendor ID** 8164  
**VSA Type** 33  
**Length** 4  
**Value** Unsigned integer

---

## SN-Prepaid-Preference

This attribute specifies whether prepaid is volume based or duration based.

**Type** 26  
**Vendor ID** 8164  
**VSA Type** 129  
**Length** 4  
**Value**

**■ Attributes**

Enumerated integer. Supported values are:

- prepaid\_duration = 0
- prepaid\_volume = 1

---

## SN-Prepaid-Timeout

This attribute indicates how much time may elapse before a new request for more pre-paid credits is issued. If the specified time has elapsed since the prior grant of credits was received from the RADIUS server, then a new request for credits is issued. This attribute is primarily used to periodically update the subscriber of new credits issued since the subscriber was connected. Note that credit requests will still be made on behalf of the subscriber when the subscriber drops down to the low watermark of credits (or zero if there is no low watermark). The presence or absence of this attribute does not affect that mechanism in any way. However, this timer is re-set whenever any grant of credits is received on behalf of the subscriber, regardless of why the grant of credits was requested.

**Type**

26

**Vendor ID**

8164

**VSA Type**

35

**Length**

4

---

## SN-Prepaid-Total-Octets

In an Access-Accept, this attribute indicates how many additional byte credits (combining both inbound and outbound counts) should be granted to the subscriber. In an Accounting- Request, this indicates how many total bytes credits (combined inbound and outbound) have been granted to the subscriber. When this attribute is not present in the Access-Accept, then pre-paid usage checking is disabled on a combined inbound and outbound octet-count basis.

**Type**

26

**Vendor ID**

8164

**VSA Type**

34

**Length**

4

**Value**

Unsigned integer

---

## SN-Prepaid-Watermark

This attribute Indicates the percentage of remaining granted credits that will trigger a new request to grant credits from the RADIUS server. For example, if 1GB of credits was granted to a user, and the value of SN-Prepaid-Watermark was 10, then

when 100 MB of credits are remaining (900 MB have been used) to the subscriber, a new request for any new byte credits is issued on behalf of the subscriber. Note that when calculating the pre-paid low watermark, the total credits granted for the subscriber's entire session is used.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	36
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## SN-Primary-DCCA-Peer

This attribute indicates the name of the primary DCCA peer and primary DCCA realm.

If this AVP is received in Access Accept message, the primary DCCA peer is used for Gy functionality. If not present in the Access Accept message or if the AVP value is invalid, the locally configured APN value will be used.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	223
<b>Length</b>	1-192
<b>Value</b>	A colon separated string, like “primary_peer : primary_realm”

---

## SN-Primary-DNS-Server

This attribute indicates the IP address of the primary DNS server that should be used for the session.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	5
<b>Length</b>	4
<b>Value</b>	

## ■ Attributes

IPv4 address

---

## SN-Primary-NBNS-Server

Primary NBNS Server IP address.

**Type**

26

**Vendor ID**

8164

**VSA Type**

148

**Length**

4

**Value**

IPv4 address

---

## SN-Proxy-MIP

This attribute specifies if the PDSN/FA will perform compulsory Proxy-MIP tunneling for a Simple-IP PDSN subscriber. This feature is licensed. The default is not to perform compulsory Proxy-MIP.

**Type**

26

**Vendor ID**

8164

**VSA Type**

52

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0 — Do not perform compulsory Proxy-MIP
- Enabled = 1 — Perform compulsory Proxy-MIP

---

## SN-Proxy-MIPv6

Enable/disable PMIPv6 for a subscriber.

**Type**

26

**Vendor ID**

8164

**VSA Type**

65530

**Length**

8

**Value**

Enumerated integer. Supported values are:

- Disabled = 0
- Enabled = 1

## SN-Pseudonym-Username

This attribute contains the pseudonym user name generated by AAA server.

**Type**

26

**Vendor ID**

8164

**VSA Type**

305

**Length**

1-256

**Value**

Opaque value

## SN-QoS-Background-Class

This attribute defines the QOS Background Traffic Class.

**Type**

26

**Vendor ID**

8164

**VSA Type**

91

**Length**

28 bytes

**Value**

Opaque value encoded in the following format:

- Byte 16 Bit 1 - Uplink Traffic Policing Enable/Disable
- Byte 16 Bit 2 - Downlink Traffic Policing Enable/Disable
- Byte 16 Bits 3,4 - Uplink Exceed Action
- Byte 16 Bits 5,6 - Downlink Exceed Action
- Byte 16 Bits 7,8 - Uplink Violate Action

- Byte 15 Bits 1,2 - Downlink Violate Action
- Byte 15 Bit 3 - Downlink Ext Peak Data Rate
- Byte 15 Bit 4 - Downlink Ext Committed Data Rate
- Byte 14 - Uplink Peak Data Rate
- Byte 13 - Downlink Peak Data Rate
- Byte 12 - Uplink Committed Data Rate
- Byte 11 - Downlink Committed Data Rate
- Byte 5-8 - Uplink Burst Size (in Network Byte Order)
- Byte 1-4 - Downlink Burst Size (in Network Byte Order)

---

## SN-QoS-Class-Background-PHB

Quality of Service DSCP classification value.

**Type**

26

**Vendor ID**

8164

**VSA Type**

113

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Best-Effort = 0
- Pass-Through = 1
- AF11 = 10
- AF12 = 12
- AF13 = 14
- AF21 = 18
- AF22 = 20
- AF23 = 22
- AF31 = 26
- AF32 = 28
- AF33 = 30
- AF41 = 34
- AF42 = 36
- AF43 = 38
- EF = 46

---

## SN-QoS-Class-Conversational-PHB

Quality of Service DSCP classification value.

**Type**

26

**Vendor ID**

8164

**VSA Type**

111

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Best-Effort = 0
- Pass-Through = 1
- AF11 = 10
- AF12 = 12
- AF13 = 14
- AF21 = 18
- AF22 = 20
- AF23 = 22
- AF31 = 26
- AF32 = 28
- AF33 = 30
- AF41 = 34
- AF42 = 36
- AF43 = 38
- EF = 46

---

## SN-QoS-Class-Interactive-1-PHB

Interactive-1 class PHB value.

**Type**

26

**Vendor ID**

8164

**VSA Type**

114

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Best-Effort = 0
- Pass-Through = 1
- AF11 = 10
- AF12 = 12
- AF13 = 14
- AF21 = 18
- AF22 = 20
- AF23 = 22
- AF31 = 26
- AF32 = 28
- AF33 = 30
- AF41 = 34
- AF42 = 36
- AF43 = 38
- EF = 46

## SN-QoS-Class-Interactive-2-PHB

Interactive-2 class PHB.

**Type**

26

**Vendor ID**

8164

**VSA Type**

115

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Best-Effort = 0
- Pass-Through = 1
- AF11 = 10
- AF12 = 12
- AF13 = 14
- AF21 = 18
- AF22 = 20
- AF23 = 22

- AF31 = 26
- AF32 = 28
- AF33 = 30
- AF41 = 34
- AF42 = 36
- AF43 = 38
- EF = 46

---

## SN-QoS-Class-Interactive-3-PHB

Interactive-3 class PHB.

**Type**

26

**Vendor ID**

8164

**VSA Type**

115

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Best-Effort = 0
- Pass-Through = 1
- AF11 = 10
- AF12 = 12
- AF13 = 14
- AF21 = 18
- AF22 = 20
- AF23 = 22
- AF31 = 26
- AF32 = 28
- AF33 = 30
- AF41 = 34
- AF42 = 36
- AF43 = 38
- EF = 46

---

## SN-QoS-Class-Streaming-PHB

Quality of Service DSCP classification value.

**Type**

26

**Vendor ID**

8164

**VSA Type**

112

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Best-Effort = 0
- Pass-Through = 1
- AF11 = 10
- AF12 = 12
- AF13 = 14
- AF21 = 18
- AF22 = 20
- AF23 = 22
- AF31 = 26
- AF32 = 28
- AF33 = 30
- AF41 = 34
- AF42 = 36
- AF43 = 38
- EF = 46

---

## SN-QoS-Conversation-Class

This attribute defines the QOS Conversation Traffic Class.

**Type**

26

**Vendor ID**

8164

**VSA Type**

86

**Length**

28 bytes

**Value**

Opaque value encoded in the following format:

- Byte 16 Bit 1 - Uplink Traffic Policing Enable/Disable
- Byte 16 Bit 2 - Downlink Traffic Policing Enable/Disable
- Byte 16 Bits 3,4 - Uplink Exceed Action
- Byte 16 Bits 5,6 - Downlink Exceed Action
- Byte 16 Bits 7,8 - Uplink Violate Action
- Byte 15 Bits 1,2 - Downlink Violate Action
- Byte 15 Bit 3 - Downlink Ext Peak Data Rate
- Byte 15 Bit 4 - Downlink Ext Committed Data Rate
- Byte 14 - Uplink Peak Data Rate
- Byte 13 - Downlink Peak Data Rate
- Byte 12 - Uplink Committed Data Rate
- Byte 11 - Downlink Committed Data Rate
- Byte 5-8 - Uplink Burst Size (in Network Byte Order)
- Byte 1-4 - Downlink Burst Size (in Network Byte Order)

## SN-QOS-HLR-Profile

QoS with Allocation Retention bit. QoS structured as per 29.002.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

303

**Length**

1-35

**Value**

Opaque value

## SN-QoS-Interactive1-Class

This attribute defines the QoS Interactive TrafficClass.

**Type**

26

**Vendor ID**

8164

**■ Attributes****VSA Type**

88

**Length**

28 bytes

**Value**

Opaque value encoded in the following format:

- Byte 16 Bit 1 - Uplink Traffic Policing Enable/Disable
- Byte 16 Bit 2 - Downlink Traffic Policing Enable/Disable
- Byte 16 Bits 3,4 - Uplink Exceed Action
- Byte 16 Bits 5,6 - Downlink Exceed Action
- Byte 16 Bits 7,8 - Uplink Violate Action
- Byte 15 Bits 1,2 - Downlink Violate Action
- Byte 15 Bit 3 - Downlink Ext Peak Data Rate
- Byte 15 Bit 4 - Downlink Ext Committed Data Rate
- Byte 14 - Uplink Peak Data Rate
- Byte 13 - Downlink Peak Data Rate
- Byte 12 - Uplink Committed Data Rate
- Byte 11 - Downlink Committed Data Rate
- Byte 5-8 - Uplink Burst Size (in Network Byte Order)
- Byte 1-4 - Downlink Burst Size (in Network Byte Order)

## SN-QoS-Interactive2-Class

This attribute defines the QoS Interactive2 Traffic Class.

**Type**

26

**Vendor ID**

8164

**VSA Type**

89

**Length**

28 bytes

**Value**

Opaque value encoded in the following format:

- Byte 16 Bit 1 - Uplink Traffic Policing Enable/Disable
- Byte 16 Bit 2 - Downlink Traffic Policing Enable/Disable
- Byte 16 Bits 3,4 - Uplink Exceed Action
- Byte 16 Bits 5,6 - Downlink Exceed Action
- Byte 16 Bits 7,8 - Uplink Violate Action

- Byte 15 Bits 1,2 - Downlink Violate Action
- Byte 15 Bit 3 - Downlink Ext Peak Data Rate
- Byte 15 Bit 4 - Downlink Ext Committed Data Rate
- Byte 14 - Uplink Peak Data Rate
- Byte 13 - Downlink Peak Data Rate
- Byte 12 - Uplink Committed Data Rate
- Byte 11 - Downlink Committed Data Rate
- Byte 5-8 - Uplink Burst Size (in Network Byte Order)
- Byte 1-4 - Downlink Burst Size (in Network Byte Order)

---

## SN-QoS-Interactive3-Class

This attribute defines the QOS Interactive3 Traffic Class.

**Type**

26

**Vendor ID**

8164

**VSA Type**

90

**Length**

28 bytes

**Value**

Opaque value encoded in the following format:

- Byte 16 Bit 1 - Uplink Traffic Policing Enable/Disable
- Byte 16 Bit 2 - Downlink Traffic Policing Enable/Disable
- Byte 16 Bits 3,4 - Uplink Exceed Action
- Byte 16 Bits 5,6 - Downlink Exceed Action
- Byte 16 Bits 7,8 - Uplink Violate Action
- Byte 15 Bits 1,2 - Downlink Violate Action
- Byte 15 Bit 3 - Downlink Ext Peak Data Rate
- Byte 15 Bit 4 - Downlink Ext Committed Data Rate
- Byte 14 - Uplink Peak Data Rate
- Byte 13 - Downlink Peak Data Rate
- Byte 12 - Uplink Committed Data Rate
- Byte 11 - Downlink Committed Data Rate
- Byte 5-8 - Uplink Burst Size (in Network Byte Order)
- Byte 1-4 - Downlink Burst Size (in Network Byte Order)

---

## SN-QoS-Negotiated

Negotiated QoS for GGSN sessions.

**Type**

26

**Vendor ID**

8164

**VSA Type**

147

**Length**

In 10.2 and earlier releases: 4–17

In 11.0 and later releases: 4–20

**Value**

ASCII string

---

## SN-QoS-Renegotiation-Timeout

This attribute configures the timeout duration of dampening time for dynamic QoS renegotiation.

**Type**

26

**Vendor ID**

8164

**VSA Type**

145

**Length**

4

**Value**

Unsigned integer

---

## SN-QoS-Streaming-Class

This attribute defines the QOS Streaming Traffic Class.

**Type**

26

**Vendor ID**

8164

**VSA Type**

87

**Length**

28 bytes

**Value**

Opaque value encoded in the following format:

- Byte 16 Bit 1 - Uplink Traffic Policing Enable/Disable
- Byte 16 Bit 2 - Downlink Traffic Policing Enable/Disable
- Byte 16 Bits 3,4 - Uplink Exceed Action
- Byte 16 Bits 5,6 - Downlink Exceed Action
- Byte 16 Bits 7,8 - Uplink Violate Action
- Byte 15 Bits 1,2 - Downlink Violate Action
- Byte 15 Bit 3 - Downlink Ext Peak Data Rate
- Byte 15 Bit 4 - Downlink Ext Committed Data Rate
- Byte 14 - Uplink Peak Data Rate
- Byte 13 - Downlink Peak Data Rate
- Byte 12 - Uplink Committed Data Rate
- Byte 11 - Downlink Committed Data Rate
- Byte 5-8 - Uplink Burst Size (in Network Byte Order)
- Byte 1-4 - Downlink Burst Size (in Network Byte Order)

---

## SN-QoS-Tp-Dnlk

This attribute enables/disables Traffic Policing/Shaping in downlink direction.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

73

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0
- Policing = 1
- Shaping = 2

---

## SN-QoS-Tp-Uplk

This attribute enables/disables Traffic Policing/Shaping in uplink direction.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

## ■ Attributes

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	79
<b>Length</b>	4
<b>Value</b>	<p>Enumerated integer. Supported values are:</p> <ul style="list-style-type: none"> <li>• Disabled = 0</li> <li>• Policing = 1</li> <li>• Shaping = 2</li> </ul>

---

## SN-QoS-Traffic-Policy

This compound attribute simplifies sending QoS values for Traffic Class, Direction, Burst-Size, Committed-Data-Rate, Peak-Data-Rate, Exceed-Action, and Violate-Action from the RADIUS server. When the SN-QoS-Traffic-Policy attribute is sent along with Acct-Session-ID attribute, the system matches the particular PDP context, and applies the new policy and retains the policy with the subscriber profile for future use. The next time the system sends a CoA request with a new policy and a different Acct-Session-ID for the same subscriber, the previously received policy is also applied to the matching PDP context along with the new policy.



**Important:** This attribute is specific to the GGSN service.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	177
<b>Value</b>	<p>Contains the following subattributes:</p>

---

### Direction

Direction of traffic.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

<b>Type</b>	1
<b>Length</b>	

1

**Value**

Unsigned integer Supported values are:

- Downlink = 0
- Uplink = 1

**Class**

Traffic class.

**Type**

2

**Length**

1

**Value**

Unsigned integer Supported values are:

- Undefined = 0
- Conversational = 1
- Streaming = 2
- Interactive TP 1 = 4
- Interactive TP 2 = 5
- Interactive TP 3 = 6
- Background = 7

**Burst-Size**

Peak burst size.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

3

**Length**

4

**Value**

Unsigned integer

**Committed-Data-Rate**

Committed data rate.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

4

<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## Peak-Data-Rate

Peak data rate.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

<b>Type</b>	5
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## Exceed-Action

Action to take on packets that exceed the Committed-Data-Rate but do not violate the Peak-Data-Rate.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

<b>Type</b>	6
<b>Length</b>	1
<b>Value</b>	Unsigned integer Supported values are: <ul style="list-style-type: none"> <li>Transmit = 0</li> <li>Drop = 1</li> <li>Lower IP Precedence = 2</li> </ul>

---

## Violate-Action

Violate action.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

<b>Type</b>	7
<b>Length</b>	1
<b>Value</b>	Unsigned integer Supported values are:

- Transmit = 0
- Drop = 1
- Lower IP Precedence = 2
- Buffer = 3
- Buffer-Transmit-On-Full = 4

---

## Auto-Readjust-Enabled

Available only in StarOS 8.1 and later. Auto-readjust enabled.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

8

**Length**

1

**Value**

Unsigned integer

---

## Auto-Readjust-Duration

Available only in StarOS 8.1 and later. Auto-readjust duration.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

9

**Length**

4

**Value**

Unsigned integer

---

## Qci

Available only in 11.0 and later releases. QOS QCI accepted values are 1 (qci 1), 2 (qci 2), 3 (qci 3), 4 (qci 4), 5 (qci 5), 6 (qci 6), 7 (qci 7), 8 (qci 8), 9 (qci 9).

**Type**

10

**Length**

1

**Value**

Unsigned integer

## ■ Attributes

---

## SN-Rad-APN-Name

This attribute specifies the RADIUS returned APN name.

If this AVP is not present in the Access Accept message or if the AVP value is invalid, the SGSN supplied APN value in create PDP context will be used for the session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

162

**Length**

1–64

**Value**

Opaque value

---

## SN-Radius-Returned-Username

This attribute is used to prefer RADIUS returned user name over constructed user name in the accounting messages.

**Type**

26

**Vendor ID**

8164

**VSA Type**

236

**Length**

4

**Value**

Enumerated integer. Supported values are:

- No = 0
- Yes = 1

---

## SN-Re-CHAP-Interval

The Periodic CHAP authentication interval for PPP, in seconds.

**Type**

26

**Vendor ID**

8164

**VSA Type**

7

**Length**

4

**Value**

Unsigned integer

---

## SN-Roaming-Behavior

This attribute specifies the configuration for the behavior bits settings for a roaming subscriber in an APN.

When GGSN is configured to reject the charging characteristics sent by the SGSN for "roaming" subscribers, it uses the profile index specified by **cc-home behavior <bits> profile <index>** command to determine the appropriate CCs to use.

Multiple behavior bits can be configured for a single profile index by "Or"ing the bit strings together and convert the result to hexadecimal. The properties of the actual CC profile index are configured as part of the GGSN service using the cc profile command.

If this AVP is present in Access Accept message the locally configured APN value will be overridden.

**Type**

26

**Vendor ID**

8164

**VSA Type**

121

**Length**

4

**Value**

Unsigned integer

---

## SN-Roaming-Profile

This attribute specifies the configuration for the profile bits settings for a roaming subscriber in an APN.

If this AVP is present in Access Accept message the locally configured APN value will be overridden.

**Type**

26

**Vendor ID**

8164

**VSA Type**

118

**Length**

4

**Value**

Unsigned integer

## SN-Roaming-Sub-Use-GGSN

This attribute configures GGSN to accept GGSN's charging characteristics for roaming subscribers defined for the APN.

If this AVP is present in Access Accept message the locally configured APN value will be overridden.

**Type**

26

**Vendor ID**

8164

**VSA Type**

108

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Deny = 0
- Accept = 1

## SN-ROHC-Flow-Marking-Mode

Configure ROHC compression for marked flows only.

**Type**

26

**Vendor ID**

8164

**VSA Type**

274

**Length**

4

**Value**

Enumerated integer. Supported values are:

- False = 0
- True = 1

## SN-ROHC-Mode

ROHC Mode.

**Type**

26

**Vendor ID**

8164

**VSA Type**

151

**Length**

4

**Value**

An integer in network order. Supported values are:

- Reliable = 0
- Optimistic = 1
- Unidirectional = 2

## SN-ROHC-Profile-Name

Specifies the ROHC profile to use for the subscriber.

**Type**

26

**Vendor ID**

8164

**VSA Type**

238

**Length**

1–64

**Value**

ASCII string

## SN-Role-Of-Node

This attribute denotes the role of the CSCF.

**Type**

26

**Vendor ID**

8164

**VSA Type**

256

**Length**

4

**Value**

Enumerated integer. Supported values are:

- ORIGINATING\_ROLE = 0
- TERMINATING\_ROLE = 1

## ■ Attributes

---

## SN-Routing-Area-Id

For GGSN calls this indicates the Routing Area ID of the subscriber.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	249
<b>Length</b>	3
<b>Value</b>	String

---

## SN-Rulebase

When the session is active charging enabled, Rulebase name will specify one of the pre configured ECSv2 rulebases in active charging subsystem.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

If this AVP is present in Access Accept message the locally configured APN value will be overridden. If there is no value configured in the APN, this value will not be applied to the session.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	249
<b>Length</b>	1–64
<b>Value</b>	String

---

## SN-SDP-Media-Components

This attribute is currently not supported. See *SN-CSCF-Rf-SDP-Media-Components*.

---

## SN-SDP-Session-Description

This attribute contains the Session portion of the SDP data exchanged between the User Agents in the SIP transaction.

<b>Type</b>	26
-------------	----

<b>Vendor ID</b>	
8164	
<b>VSA Type</b>	
263	
<b>Length</b>	
4	
<b>Value</b>	
ASCII string	

---

## SN-Sec-IP-Pool-Name

Available only in StarOS 8.1 and later. This attribute contains the secondary IP pool name.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	265
<b>Length</b>	1–253
<b>Value</b>	String

---

## SN-Secondary-DCCA-Peer

This attribute indicates the name of the Secondary DCCA peer and Secondary DCCA realm.

If this AVP is received in Access Accept message the secondary DCCA peer is used for Gy functionality. If not present in the Access Accept message or if the AVP value is invalid, the locally configured APN value will be used.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	224
<b>Length</b>	1–192
<b>Value</b>	A colon separated string, like “secondary_peer : secondary_realm”.

**■ Attributes**

---

## SN-Secondary-DNS-Server

This attribute indicates the IP address of the secondary DNS server that should be used for the session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

6

**Length**

4

**Value**

IPv4 address

---

## SN-Secondary-NBNS-Server

Secondary NBNS server IP address.

**Type**

26

**Vendor ID**

8164

**VSA Type**

149

**Length**

4

**Value**

IPv4 address

---

## SN-Served-Party-Address

This attribute is currently not supported.

---

## SN-Service-Address

Used to send bind IP address of the service in RADIUS messages.

**Type**

26

**Vendor ID**

8164

**VSA Type**

169

**Length**

4

**Value**

IPv4 address

---

## SN-Service-Type

This attribute indicates the service type that the user is accessing.

**Type**

26

**Vendor ID**

8164

**VSA Type**

24

**Length**

4

**Value**

Enumerated integer. Supported values are:

- None = 0
- PDSN = 1
- Management = 2
- HA = 3
- GGSN = 4
- LNS = 5
- IPSG = 6
- CSCF = 7
- ASNGW = 8
- PDIF = 9
- STANDALONE\_FA = 10
- SGSN = 11
- PHSGW = 12
- PDG = 13
- MIPV6HA = 14
- PGW = 15
- SGW = 16
- FNG = 17
- OGW = 18 — NOTE: Applicable only in release 12.0.
- HNBGW = 19
- BNG = 20

## ■ Attributes

---

## SN-Session-Id

This attribute contains Call-ID of the SIP session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

257

**Length**

4

**Value**

ASCII string

---

## SN-Simultaneous-SIP-MIP

This attribute indicates if a PDSN Subscriber can simultaneously be given Simple IP and Mobile IP service.

**Type**

26

**Vendor ID**

8164

**VSA Type**

22

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0
- Enabled = 1

---

## SN-SIP-Method

This attribute identifies the SIP-method for which acct request is sent.

**Type**

26

**Vendor ID**

8164

**VSA Type**

254

**Length**

4

**Value**

ASCII string

---

## SN-SIP-Request-Time-Stamp

This attribute specifies the time of initial SIP request.

**Type**

26

**Vendor ID**

8164

**VSA Type**

258

**Length**

4

**Value**

ASCII string

---

## SN-SIP-Response-Time-Stamp

This attribute specifies the time of response to initial SIP request.

**Type**

26

**Vendor ID**

8164

**VSA Type**

259

**Length**

4

**Value**

ASCII string

---

## SN-Software-Version

Provides the Software version. This contains the major version number, minor version number and build number.

**Type**

26

**Vendor ID**

8164

**VSA Type**

288

**Length**

**■ Attributes**

1–32

**Value**

ASCII string

## SN-Subs-Acc-Flow-Traffic-Valid

This attribute indicates the subscriber account flow traffic is valid.

**Type**

26

**Vendor ID**

8164

**VSA Type**

225

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disable = 0
- Enable = 1

## SN-Subscriber-Accounting

This attribute specifically enables or disables subscriber accounting. Note that if enabled, subscriber accounting still needs to be enabled in the subscriber's AAA context for accounting to be performed.

The AVP value 0 means no accounting; 1 indicates RADIUS accounting; and 2 indicates GTPP accounting. If an invalid value is received or if the AVP is not present in the Access Accept message, the locally configured APN value will be used.

**Type**

26

**Vendor ID**

8164

**VSA Type**

64

**Length**

4

**Value**

Enumerated integer. Supported values are:

- None = 0
- Radius = 1
- GTPP = 2

## SN-Subscriber-Acct-Interim

This attribute specifies if accounting INTERIM messages are enabled for the subscriber. Note that accounting must also be globally enabled for the subscriber (SN-Subscriber-Accounting), and enabled for the subscriber's AAA context (along with a specific INTERIM interval), if accounting INTERIM messages are to be sent.

The AVP value 0 represents normal or enabled for generating accounting START messages. The value 1 represents enabled for suppressing RADIUS accounting START messages.

If the AVP is not present in the Access Accept message or if the AVP value is invalid, the value 0 is assumed.

**Type**

26

**Vendor ID**

8164

**VSA Type**

70

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Normal = 0
- Suppress = 1

## SN-Subscriber-Acct-Mode

This attribute contains the subscriber accounting mode.

**Type**

26

**Vendor ID**

8164

**VSA Type**

192

**Length**

4

**Value**

Enumerated integer. Supported values are:

- flow-based-auxilliary = 0
- flow-based-all = 1
- flow-based-none = 2
- session-based = 3
- main-a10-only = 4

## SN-Subscriber-Acct-Rsp-Action

When this attribute is set to None, there is no action taken while waiting for a response for the accounting start message from the RADIUS server. When this attribute is set to No-Early-PDUs the system buffers all packets from the user (uplink) until a response for the accounting start message is received from the RADIUS server. When set to Delay\_GTP\_Response, the system does not send a GTP create response to the GGSN until a response for the accounting start message is received from the RADIUS server.

**Type**

26

**Vendor ID**

8164

**VSA Type**

100

**Length**

4

**Value**

Enumerated integer. Supported values are:

- None = 0
- No\_Early\_PDUs = 1
- Delay\_GTP\_Response = 2

## SN-Subscriber-Acct-Start

This attribute specifies if accounting START messages are enabled for the subscriber. Note that accounting must also be globally enabled for the subscriber (SN-Subscriber-Accounting), and enabled for the subscriber's AAA context, if accounting START messages are to be sent.

The AVP value 0 represents normal or enabled for generating accounting START messages. The value 1 represents enabled for suppressing RADIUS accounting START messages.

If the AVP is not present in the Access Accept message or if the AVP value is invalid, the value 0 is assumed.

**Type**

26

**Vendor ID**

8164

**VSA Type**

69

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Normal = 0
- Suppress = 1

## SN-Subscriber-Acct-Stop

This attribute specifies if accounting STOP messages are enabled for the subscriber. Note that accounting must also be globally enabled for the subscriber (**SN-Subscriber-Accounting**), and enabled for the subscriber's AAA context, if accounting STOP messages are to be sent.

The AVP value 0 represents normal or enabled for generating accounting STOP messages. The value 1 represents enabled for suppressing RADIUS accounting STOP messages.

If the AVP is not present in the Access Accept message or if the AVP value is invalid, the value 0 is assumed.

**Type**

26

**Vendor ID**

8164

**VSA Type**

71

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Normal = 0
- Suppress = 1

## SN-Subscriber-Class

Customer-specific attribute to support specific subscriber billing behavior.

**Type**

26

**Vendor ID**

8164

**VSA Type**

219

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Normal\_Subscriber = 0
- Ting\_100 = 1
- Ting\_500 = 2
- Ting\_Buddy = 3
- Ting\_Star = 4
- Ting\_Nolimit\_SMS = 5
- Kids\_Locator = 6

## ■ Attributes

- Ting\_2000 = 7
- Handicapped\_Welfare = 8
- Reserved = 9

---

## SN-Subscriber-Dormant-Activity

This attribute specifies whether to treat dormant packets routed to the mobile as activity for idle timeout purposes. The default is Enabled. Disabled means dormant packets routed to the mobile is not treated as activity for idle timeout purposes.

**Type**

26

**Vendor ID**

8164

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0
- Enabled = 1

---

## SN-Subscriber-IP-Hdr-Neg-Mode

This attribute specifies whether to wait (detect) for IP header compression to be requested by the mobile before responding, or not to wait (force). Force is the default.

**Type**

26

**Vendor ID**

8164

**VSA Type**

67

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Force = 0
- Detect = 1

---

## SN-Subscriber-IP-TOS-Copy

This attribute controls the copying of the IP TOS octet value from IPv4 datagrams to the IP header in tunnel encapsulation.

**Type**

26

<b>Vendor ID</b>	8164
<b>VSA Type</b>	85
<b>Length</b>	4
<b>Value</b>	<p>Enumerated integer. Supported values are:</p> <ul style="list-style-type: none"> <li>• None = 0</li> <li>• Access-Tunnel = 1</li> <li>• Data-Tunnel = 2</li> <li>• Both = 3</li> </ul>

---

## SN-Subscriber-Nexthop-Address

This attribute specifies the nexthop gateway address to be returned by AAA on a per subscriber basis.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	127
<b>Length</b>	4
<b>Value</b>	IPv4 address

---

## SN-Subscriber-No-Interims

This is a GGSN specific attribute. When set to 0 (disabled) interim accounting is generated. When set to 1 (enabled) interim accounting generation is disabled.

If the AVP is not present in the Access Accept message or if the AVP value is invalid, the value 0 is assumed.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	133
<b>Length</b>	4
<b>Value</b>	

## ■ Attributes

Enumerated integer. Supported values are:

- Enabled = 0
- Disabled = 1

---

## SN-Subscriber-Permission

This attribute indicates the services allowed to be delivered to the subscriber. The attribute value is a bit field, and many algorithms can be specified to indicate that one of these may be chosen by the user.

**Type**

26

**Vendor ID**

8164

**VSA Type**

20

**Length**

4

**Value**

Enumerated integer. In StarOS 8.1 and earlier, supported values are:

- None = 0
- Simple-IP = 1
- Mobile-IP = 2
- Simple-IP-Mobile-IP = 3
- HA-Mobile-IP = 4
- Simple-IP-HA-Mobile-IP = 5
- Mobile-IP-HA-Mobile-IP = 6
- All = 7

In StarOS 8.3 and later, supported values are:

- None = 0
- Simple-IP = 1
- Mobile-IP = 2
- Simple-IP-Mobile-IP = 3
- HA-Mobile-IP = 4
- Simple-IP-HA-Mobile-IP = 5
- Mobile-IP-HA-Mobile-IP = 6
- SIP-MIP-HA-MIP = 7
- GGSN-PDP-TYPE-IP = 0x08, # see SessSubscriberPermission in sess\_common.x
- GGSN-PDP-TYPE-PPP = 0x10, # see SessSubscriberPermission in sess\_common.x
- Network-Mobility = 0x20
- FA-HA-NEMO = 0x26

- All = 0x3F

---

## SN-Subscriber-Template-Name

RADIUS returned subscriber template.

**Type**  
26

**Vendor ID**  
8164

**VSA Type**  
158

**Length**  
1–127

**Value**  
String

---

## SN-Subs-IMSA-Service-Name

IMS authorization service name.

**Type**  
26

**Vendor ID**  
8164

**VSA Type**  
159

**Length**  
1–128

**Value**  
String

---

## SN-Subs-VJ-Slotid-Cmp-Neg-Mode

Enable/Disable slot ID compression in either direction when using VJ compression.

**Type**  
26

**Vendor ID**  
8164

**VSA Type**  
221

**Length**  
4

**■ Attributes****Value**

Enumerated integer. Supported values are:

- None = 0
- Receive = 1
- Transmit = 2
- Both = 3

## SN-Transparent-Data

This AVP is used by RADIUS to provide Global Title information for the GGSN to use in CDRs and Quota Auth.

**Type**

26

**Vendor ID**

8164

**VSA Type**

247

**Length**

In StarOS 8.1 and later: 1–247

In StarOS 8.0: 1–237

**Value**

Opaque value

## SN-Terminating-IOI

This attribute holds the Inter Operator Identifier for the originating network in the home network of the terminating end user.

**Type**

26

**Vendor ID**

8164

**VSA Type**

262

**Length**

4

**Value**

ASCII string

## SN-Tp-Dnlk-Burst-Size

This attribute specifies the Traffic Policing downlink burst size in bytes.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	76
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## SN-Tp-Dnlk-Committed-Data-Rate

This attribute specifies the Traffic Policing downlink committed data rate in bps.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	74
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## SN-Tp-Dnlk-Exceed-Action

This attribute specifies the action to take on Traffic Policing downlink packets that exceed the committed-data-rate but do not violate the peak-data-rate.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	77
<b>Length</b>	4
<b>Value</b>	Enumerated integer. Supported values are:

## ■ Attributes

- Transmit = 0
- Drop = 1
- Lower-IP-Precendence = 2
- Buffer = 3
- Transmit-On-Buffer-Full = 4

---

## SN-Tp-Dnlk-Peak-Data-Rate

This attribute specifies the Traffic Policing downlink peak data rate in bps.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

75

**Length**

4

**Value**

Unsigned integer

---

## SN-Tp-Dnlk-Violate-Action

This attribute specifies the action to take on Traffic Policing downlink packets that exceed both the committed-data-rate and the peak-data-rate.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

78

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Transmit = 0
- Drop = 1
- Lower-IP-Precendence = 2
- Buffer = 3

- Transmit-On-Buffer-Full = 4

---

## SN-Tp-Uplk-Burst-Size

This attribute specifies the Traffic Policing uplink burst size in bytes.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

82

**Length**

4

**Value**

Unsigned integer

---

## SN-Tp-Uplk-Committed-Data-Rate

This attribute specifies the Traffic Policing uplink committed data rate in bps.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

80

**Length**

4

**Value**

Unsigned integer

---

## SN-Tp-Uplk-Exceed-Action

This attribute specifies the action to take on Traffic Policing uplink packets that exceed the committed-data-rate but do not violate the peak-data-rate.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

8164

## ■ Attributes

**VSA Type**

83

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Transmit = 0
- Drop = 1
- Lower-IP-Precendence = 2
- Buffer = 3
- Transmit-On-Buffer-Full = 4

## SN-Tp-Uplk-Peak-Data-Rate

This attribute specifies the Traffic Policing Uplink Peak Data Rate in bps.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

81

**Length**

4

**Value**

Unsigned integer

## SN-Tp-Uplk-Violate-Action

This attribute specifies the action to take on Traffic Policing uplink packets that exceed both the committed-data-rate and the peak-data-rate.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

84

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Transmit = 0
- Drop = 1
- Lower-IP-Precedence = 2
- Buffer = 3
- Transmit-On-Buffer-Full = 4

## SN-TPO-Policy

This attribute contains the TPO policy name.

**Type**

26

**Vendor ID**

8164

**VSA Type**

308

**Length**

1–63

**Value**

String

## SN-Traffic-Group

This attribute is used to assign a tag to an FA or a group of FAs, so that traffic policy can be enforced based on the tag value.

**Type**

26

**Vendor ID**

8164

**VSA Type**

161

**Length**

2

**Value**

Unsigned integer

## SN-TrafficSelector-Class

The ipsec traffic selector class.

**Type**

26

## ■ Attributes

**Vendor ID**  
8164

**VSA Type**  
307

**Length**  
4

**Value**  
Unsigned integer

## SN-Tun-Addr-Policy

Describes IP address validation policy for non L2TP tunneled calls.

**Type**  
26

**Vendor ID**  
8164

**VSA Type**  
156

**Length**  
4

**Value**  
Enumerated integer. Supported values are:

- no-local-alloc-validate = 0
- local-alloc = 1
- local-alloc-validate = 2

## SN-Tunnel-Gn

Used to enable/disable Gn interface from PDG/TTG to GGSN.

**Type**  
26

**Vendor ID**  
8164

**VSA Type**  
174

**Length**  
4

**Value**  
Enumerated integer. Supported values are:

- Disabled = 0
- Enabled = 1

---

## SN-Tunnel-ISAKMP-Crypto-Map

This attribute specifies the system-defined crypto map to use for the subscriber's Mobile-IP connection, when IPSec is used to protect the Mobile-IP connection. This attribute is salt-encrypted.

**Type**

26

**Vendor ID**

8164

**VSA Type**

38

**Length**

1–128

**Value**

String

---

## SN-Tunnel-ISAKMP-Secret

This attribute specifies the secret to use for IKE.

**Type**

26

**Vendor ID**

8164

**VSA Type**

39

**Length**

1–128

**Value**

String

---

## SN-Tunnel-Load-Balancing

This attribute specifies the load-balancing algorithm to use when tunneling is employed.

**Type**

26

**Vendor ID**

8164

**VSA Type**

27

**Length**

4

**Value**

Enumerated integer. Supported values are:

## ■ Attributes

- random = 1
- balanced = 2
- prioritized = 3

---

## SN-Tunnel-Password

This attribute contains a secret for tunneling usage. Currently this is only used for L2TP. It is recommended that you use the Tunnel-Password attribute if your RADIUS server supports salt-encryption of attributes.

**Type**

26

**Vendor ID**

8164

**VSA Type**

26

**Length**

1–240

**Value**

Opaque value

---

## SN-Unclassify-List-Name

Unclassify List Name.

**Type**

26

**Vendor ID**

8164

**VSA Type**

132

**Length**

1–32

**Value**

An ASCII string

---

## SN-Virtual-APN-Name

This attribute contains the virtual APN name.

**Type**

26

**Vendor ID**

8164

**VSA Type**

94

**Length**

1–64

**Value**

ASCII string

## SN-Visiting-Behavior

This attribute specifies the configuration for the behavior bits settings for a visiting subscriber in an APN.

When GGSN is configured to reject the charging characteristics sent by the SGSN for "home" subscribers, it uses the profile index specified by **cc-home behavior <bits> profile <index>** command to determine the appropriate CCs to use.

Multiple behavior bits can be configured for a single profile index by "Or"ing the bit strings together and convert the result to hexadecimal. The properties of the actual CC profile index are configured as part of the GGSN service using the cc profile command.

If this AVP is present in Access Accept message the locally configured APN value will be overridden.

**Type**

26

**Vendor ID**

8164

**VSA Type**

120

**Length**

4

**Value**

Unsigned integer

## SN-Visiting-Profile

This attribute specifies the configuration for the profile bits settings for a visiting subscriber in an APN.

If this AVP is present in Access Accept message the locally configured APN value will be overridden.

**Type**

26

**Vendor ID**

8164

**VSA Type**

117

**Length**

4

**Value**

Unsigned integer

---

## SN-Visiting-Sub-Use-GGSN

This attribute configures GGSN to accept GGSN's charging characteristics for visiting subscribers defined for the APN.

If this AVP is present in Access Accept message the locally configured APN value will be overridden.

**Type**

26

**Vendor ID**

8164

**VSA Type**

107

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Deny = 0
- Accept = 1

---

## SN-Voice-Push-List-Name

SN-Voice-Push-List-Name.

**Type**

26

**Vendor ID**

8164

**VSA Type**

131

**Length**

1–32

**Value**

ASCII string

---

## SN-VPN-ID

This attribute contains the Destination VPN of the user, specified by a 32-bit identifier.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1

**Length**

4

**Value**

Unsigned integer

## SN-VPN-Name

This attribute contains the name of the user's Destination VPN.

**Type**

26

**Vendor ID**

8164

**VSA Type**

2

**Length**

1–253

**Value**

ASCII string

## SN-WiMAX-Auth-Only

Specifies whether the call is established for Authentication Mode Only.

**Type**

26

**Vendor ID**

8164

**VSA Type**

306

**Length**

1

**Value**

Enumerated integer. Supported values are:

- Disabled = 0
- Enabled = 1

## SN1-Access-link-IP-Frag

This attribute specifies what to do when data received for the subscriber on the Access link that needs to be fragmented and the DF bit is either set or unset. The default is Normal.

**Type**

26

**Vendor ID**

## ■ Attributes

8164

**VSA Type**

63

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Normal = 0 — Data to be fragmented is not fragmented if the DF bit is set
- DF-Ignore = 1 — Fragment regardless
- DF-Fragment-ICMP-Notify = 2 — Fragment regardless, and ICMP Notify if DF bit is set

## SN1-Acct-Input-Giga-Dropped

This attribute contains the number of input gigawords dropped if the number of input bytes is greater than  $2^{32} - 1$ **Type**

26

**Vendor ID**

8164

**VSA Type**

230

**Length**

4

**Value**

Unsigned integer

## SN1-Acct-Input-Octets-Dropped

This attribute contains the number of input bytes dropped.

**Type**

26

**Vendor ID**

8164

**VSA Type**

228

**Length**

4

**Value**

Unsigned integer

---

## SN1-Acct-Input-Packets-Dropped

This attribute contains the number of input packets dropped.

**Type**

26

**Vendor ID**

8164

**VSA Type**

226

**Length**

4

**Value**

Unsigned integer

---

## SN1-Acct-Output-Giga-Dropped

This attribute contains the number of output gigawords dropped if the number of output bytes is greater than  $2^{32} - 1$ .

**Type**

26

**Vendor ID**

8164

**VSA Type**

231

**Length**

4

**Value**

integer

---

## SN1-Acct-Output-Octets-Dropped

This attribute contains the number of output bytes dropped.

**Type**

26

**Vendor ID**

8164

**VSA Type**

229

**Length**

4

**Value**

Integer

## ■ Attributes

---

## SN1-Acct-Output-Packets-Dropped

This attribute contains the number of output packets dropped.

**Type**

26

**Vendor ID**

8164

**VSA Type**

227

**Length**

4

**Value**

Integer

---

## SN1-Admin-Expiry

This attribute contains the date/time the administrative user account expires. It is an integer value specifying the number of seconds since the UNIX epoch at which time the account will expire.

**Type**

26

**Vendor ID**

8164

**VSA Type**

72

**Length**

4

**Value**

Integer

---

## SN1-Admin-Permission

This attribute indicates the services allowed to be delivered to the administrative user. The attribute value is a bit field, and many algorithms can be specified to indicate that one of these may be chosen by the user.

**Type**

26

**Vendor ID**

8164

**VSA Type**

21

**Length**

4

**Value**

Enumerated integer. Supported values are:

- None = 0
- CLI = 1
- FTP = 2
- CLI-FTP = 3
- Intercept = 4
- CLI-Intercept = 5
- CLI-Intercept-FTP = 7
- ECS = 8
- CLI-ECS = 9
- CLI-FTP-ECS = 11
- CLI-Intercept-ECS = 13
- CLI-Intercept-FTP-ECS = 15

---

## SN1-Assigned-VLAN-ID

The VLAN ID assigned to the subscriber.

**Type**

26

**Vendor ID**

8164

**VSA Type**

152

**Length**

4

**Value**

Unsigned integer

---

## SN1-Call-Id

Internal system generated call ID number for the session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

251

**Length**

4

**Value**

## ■ Attributes

Unsigned integer

---

## SN1-Cause-For-Rec-Closing

This attribute contains a reason for the release of the CDR.

**Type**

26

**Vendor ID**

8164

**VSA Type**

139

**Length**

4

**Value**

Enumerated integer. Supported values are:

- normalRelease = 0
- abnormalRelease = 4
- volumeLimit = 16
- timeLimit = 17
- SGSNChange = 18
- maxChangeCond = 19
- managementIntervention = 20

---

## SN1-CFPolicy-ID

This attribute contains the Content Filtering policy ID.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

220

**Length**

4

**Value**

Unsigned integer

---

## SN1-Change-Condition

This attribute defines the reason for closing the container.

**Type**

26

**Vendor ID**

8164

**VSA Type**

140

**Length**

4

**Value**

Enumerated integer. Supported values are:

- QOSCHANGE = 0
- TARIFFTIMECHANGE = 1
- SGSNCHANGE = 500

---

## SN1-Charging-VPN-Name

Charging VPN Name.

**Type**

26

**Vendor ID**

8164

**VSA Type**

137

**Length**

1–252

**Value**

String

---

## SN1-Chrg-Char-Selection-Mode

This attribute contains the charging characteristics type that the GSNs applied to the CDR.

**Type**

26

**Vendor ID**

8164

**VSA Type**

138

**Length**

## ■ Attributes

4

**Value**

Integer. Supported values are:

- SGSN = 0
- HOME = 3
- ROAMING = 4
- VISITING = 5

**SN1-Data-Tunnel-Ignore-DF-Bit**

This attribute specifies if the PDSN/FA or HA should ignore the DF bit in the IPv4 header when encapsulating the IPv4 packet in MIP, and therefore fragmenting the resulting tunneled packet if necessary. The default is not to ignore the DF bit.

**Type**

26

**Vendor ID**

8164

**VSA Type**

49

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0 — Do not ignore DF bit
- Enabled = 1 — Ignore DF bit

**SN1-DHCP-Lease-Expiry-Policy**

This attribute specifies whether to renew or disconnect on expiry of IP address lease time.

**Type**

26

**Vendor ID**

8164

**VSA Type**

157

**Length**

4

**Value**

Enumerated integer. Supported values are:

- auto-renew = 0
- disconnect = 1

## SN1-Disconnect-Reason

This attribute contains the reason the user was disconnected from service.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

3

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Not-Defined = 0
- Admin-Disconnect = 1
- Remote-Disconnect = 2
- Local-Disconnect = 3
- Disc-No-Resource = 4
- Disc-Excd-Service-Limit = 5
- PPP-LCP-Neg-Failed = 6
- PPP-LCP-No-Response = 7
- PPP-LCP-Loopback = 8
- PPP-LCP-Max-Retry = 9
- PPP-Echo-Failed = 10
- PPP-Auth-Failed = 11
- PPP-Auth-Failed-No-AAA-Resp = 12
- PPP-Auth-No-Response = 13
- PPP-Auth-Max-Retry = 14
- Invalid-AAA-Attr = 15
- Failed-User-Filter = 16
- Failed-Provide-Service = 17
- Invalid-IP-Address-AAA = 18
- Invalid-IP-Pool-AAA = 19
- PPP-IPCP-Neg-Failed = 20
- PPP-IPCP-No-Response = 21
- PPP-IPCP-Max-Retry = 22
- PPP-No-Rem-IP-Address = 23

## ■ Attributes

- Inactivity-Timeout = 24
- Session-Timeout = 25
- Max-Data-Excd = 26
- Invalid-IP-Source-Address = 27
- MSID-Auth-Failed = 28
- MSID-Auth-Failed-No-AAA-Resp = 29
- A11-Max-Retry = 30
- A11-Lifetime-Expired = 31
- A11-Message-Integrity-Failure = 32
- PPP-lcp-remote-disc = 33
- Session-setup-timeout = 34
- PPP-keepalive-failure = 35
- Flow-add-failed = 36
- Call-type-detection-failed = 37
- Wrong-ipcp-params = 38
- MIP-remote-dereg = 39
- MIP-lifetime-expiry = 40
- MIP-proto-error = 41
- MIP-auth-failure = 42
- MIP-reg-timeout = 43
- Invalid-dest-context = 44
- Source-context-removed = 45
- Destination-context-removed = 46
- Req-service-addr-unavailable = 47
- Demux-mgr-failed = 48
- Internal-error = 49
- AAA-context-removed = 50
- invalid-service-type = 51
- mip-relay-req-failed = 52
- mip-rcvd-relay-failure = 53
- ppp-restart-inter-pdsn-handoff = 54
- gre-key-mismatch = 55
- invalid\_tunnel\_context = 56
- no\_peer\_lns\_address = 57
- failed\_tunnel\_connect = 58
- l2tp-tunnel-disconnect-remote = 59
- l2tp-tunnel-timeout = 60

- l2tp-protocol-error-remote = 61
- l2tp-protocol-error-local = 62
- l2tp-auth-failed-remote = 63
- l2tp-auth-failed-local = 64
- l2tp-try-another-lns-from-remote = 65
- l2tp-no-resource-local = 66
- l2tp-no-resource-remote = 67
- l2tp-tunnel-disconnect-local = 68
- l2tp-admin-disconnect\_remote = 69
- l2tpmgr-reached-max-capacity = 70
- MIP-reg-revocation = 71
- path-failure = 72
- dhcp-relay-ip-validation-failed = 73
- gtp-unknown-pdp-addr-or-pdp-type = 74
- gtp-all-dynamic-pdp-addr-occupied = 75
- gtp-no-memory-is-available = 76
- dhcp-relay-static-ip-addr-not-allowed = 77
- dhcp-no-ip-addr-allocated = 78
- dhcp-ip-addr-allocation-tmr-exp = 79
- dhcp-ip-validation-failed = 80
- dhcp-static-addr-not-allowed = 81
- dhcp-ip-addr-not-available-at-present = 82
- dhcp-lease-expired = 83
- lpool-ip-validation-failed = 84
- lpool-static-ip-addr-not-allowed = 85
- static-ip-validation-failed = 86
- static-ip-addr-not-present = 87
- static-ip-addr-not-allowed = 88
- radius-ip-validation-failed = 89
- radius-ip-addr-not-provided = 90
- invalid-ip-addr-from-sgsn = 91
- no-more-sessions-in-aaa = 92
- ggsn-aaa-auth-req-failed = 93
- conflict-in-ip-addr-assignment = 94
- apn-removed = 95
- credits-used-bytes-in = 96
- credits-used-bytes-out = 97

- credits-used-bytes-total = 98
- prepaid-failed = 99
- l2tp-ipsec-tunnel-failure = 100
- l2tp-ipsec-tunnel-disconnected = 101
- mip-ipsec-sa-inactive = 102
- Long-Duration-Timeout = 103
- proxy-mip-registration-failure = 104
- proxy-mip-binding-update = 105
- proxy-mip-inter-pdsn-handoff-require-ip-address = 106
- proxy-mip-inter-pdsn-handoff-mismatched-address = 107
- Local-purge = 108
- failed-update-handoff = 109
- closed\_rp-handoff-complete = 110
- closed\_rp-duplicate-session = 111
- closed\_rp-handoff-session-not-found = 112
- closed\_rp-handoff-failed = 113
- pcf-monitor-keep-alive-failed = 114
- call-internal-reject = 115
- call-restarted = 116
- a11-mn-ha-auth-failure = 117
- a11-badly-formed = 118
- a11-t-bit-not-set = 119
- a11-unsupported-vendor-id = 120
- a11-mismatched-id = 121
- mipha-dup-home-addr-req = 122
- mipha-dup-imsi-session = 123
- ha-unreachable = 124
- IPSP-addr-in-use = 125
- mipfa-dup-home-addr-req = 126
- mipha-ip-pool-busyout = 127
- inter-pdsn-handoff = 128
- active-to-dormant = 129
- ppp-renegotiation = 130
- active-start-param-change = 131
- tariff-boundary = 132
- a11-disconnect-no-active-stop = 133
- nw-reachability-failed-reject = 134

- nw-reachability-failed-redirect = 135
- container-max-exceeded = 136
- static-addr-not-allowed-in-apn = 137
- static-addr-required-by-radius = 138
- static-addr-not-allowed-by-radius = 139
- mip-registration-dropped = 140
- counter-rollover = 141
- constructed-nai-auth-fail = 142
- inter-pdsn-service-optimize-handoff-disabled = 143
- gre-key-collision = 144
- inter-pdsn-service-optimize-handoff-triggered = 145
- intra-pdsn-handoff-triggered = 146
- delayed-abort-timer-expired = 147
- Admin-AAA-disconnect = 148
- Admin-AAA-disconnect-handoff = 149
- PPP-IPV6CP-Neg-Failed = 150
- PPP-IPV6CP-No-Response = 151
- PPP-IPV6CP-Max-Retry = 152
- PPP-Restart-Invalid-source-IPV4-address = 153
- a11-disconnect-handoff-no-active-stop = 154
- call-restarted-inter-pdsn-handoff = 155
- call-restarted-ppp-termination = 156
- mipfa-resource-conflict = 157
- failed-auth-with-charging-svc = 158
- miphfa-dup-imsi-session-purge = 159
- miphfa-rev-pending-newcall = 160
- volume-quota-reached = 161
- duration-quota-reached = 162
- gtp-user-authentication-failed = 163
- MIP-reg-revocation-no-lcp-term = 164
- MIP-private-ip-no-rev-tunnel = 165
- Invalid-Prepaid-AAA-attr-in-auth-response = 166
- miphfa-prepaid-reset-dynamic-newcall = 167
- gre-flow-control-timeout = 168
- mip-paaa-bc-query-not-found = 169
- miphfa-dynamic-ip-addr-not-available = 170
- a11-mismatched-id-on-handoff = 171

- a11-badly-formed-on-handoff = 172
- a11-unsupported-vendor-id-on-handoff = 173
- a11-t-bit-not-set-on-handoff = 174
- MIP-reg-revocation-i-bit-on = 175
- A11-RRQ-Deny-Max-Count = 176
- Dormant-Transition-During-Session-Setup = 177
- PPP-Rem-Reneg-Disc-Always-Cfg = 178
- PPP-Rem-Reneg-Disc-NAI-MSID-Mismatch = 179
- miph-a-subscriber-ipsec-tunnel-down = 180
- miph-a-subscriber-ipsec-tunnel-failed = 181
- miph-a-subscriber-ipsecmgr-death = 182
- flow-is-deactivated = 183
- ecsv2-license-exceeded = 184
- IPSG-Auth-Failed = 185
- driver-initiated = 186
- ims-authorization-failed = 187
- service-instance-released = 188
- flow-released = 189
- ppp-renego-no-ha-addr = 190
- intra-pdsn-handoff = 191
- overload-disconnect = 192
- css-service-not-found = 193
- Auth-Failed = 194
- dhcp-client-sent-release = 195
- dhcp-client-sent-nak = 196
- msid-dhcp-chaddr-mismatch = 197
- link-broken = 198
- prog-end-timeout = 199
- qos-update-wait-timeout = 200
- css-synch-cause = 201
- Gtp-context-replacement = 202
- PDIF-Auth-failed = 203
- l2tp-unknown-apn = 204
- ms-unexpected-network-reentry = 205
- r6-invalid-nai = 206
- eap-max-retry-reached = 207
- vbm-hoa-session-disconnected = 208

- vbm-voa-session-disconnected = 209
- in-acl-disconnect-on-violation = 210
- eap-msk-lifetime-expiry = 211
- eap-msk-lifetime-too-low = 212
- mipfa-inter-tech-handoff = 213
- r6-max-retry-reached = 214
- r6-nwexit-recd = 215
- r6-dereg-req-recd = 216
- r6-remote-failure = 217
- r6r4-protocol-errors = 218
- wimax-qos-invalid-aaa-attr = 219
- npu-gre-flows-not-available = 220
- r4-max-retry-reached = 221
- r4-nwexit-recd = 222
- r4-dereg-req-recd = 223
- r4-remote-failure = 224
- ims-authorization-revoked = 225
- ims-authorization-released = 226
- ims-auth-decision-invalid = 227
- mac-addr-validation-failed = 228
- excessive-wimax-pd-flows-cfgd = 229
- sgsn-canc-loc-sub = 230
- sgsn-canc-loc-upd = 231
- sgsn-mnr-exp = 232
- sgsn-ident-fail = 233
- sgsn-sec-fail = 234
- sgsn-auth-fail = 235
- sgsn-glu-fail = 236
- sgsn-imp-det = 237
- sgsn-smgr-purge = 238
- sgsn-subs-handed-to-peer = 239
- sgsn-dns-fail-inter-rau = 240
- sgsn-cont-rsp-fail = 241
- sgsn-hlr-not-found-for-imsi = 242
- sgsn-ms-init-det = 243
- sgsn-opr-policy-fail = 244
- sgsn-duplicate-context = 245

## ■ Attributes

- hss-profile-update-failed = 246
- sgsn-no-pdp-activated = 247
- asnpc-idle-mode-timeout = 248
- asnpc-idle-mode-exit = 249
- asnpc-idle-mode-auth-failed = 250
- asngw-invalid-qos-configuration = 251
- sgsn-dsd-allgprswithdrawn = 252
- r6-pmk-key-change-failure = 253
- sgsn-illegal-me = 254
- sess-termination-timeout = 255
- sgsn-sai-fail = 256
- sgsn-rnc-removal = 257
- sgsn-rai-removal = 258
- sgsn-init-deact = 259
- ggsn-init-deact = 260
- hlr-init-deact = 261
- ms-init-deact = 262
- sgsn-detach-init-deact = 263
- sgsn-rab-rel-init-deact = 264
- sgsn-iu-rel-init-deact = 265
- sgsn-gtpu-path-failure = 266
- sgsn-gtpc-path-failure = 267
- sgsn-local-handoff-init-deact = 268
- sgsn-remote-handoff-init-deact = 269
- sgsn-gtp-no-resource = 270
- sgsn-rnc-no-resource = 271
- sgsn-odb-init-deact = 272
- sgsn-invalid-ti = 273
- sgsn-ggsn-ctxt-non-existent = 274
- sgsn-apn-restrict-vio = 275
- sgsn-regular-deact = 276
- sgsn-abnormal-deact = 277
- sgsn-actv-rejected-by-peer = 278
- sgsn-err-ind = 279
- asngw-non-anchor-prohibited = 280
- asngw-im-entry-prohibited = 281
- session-idle-mode-entry-timeout = 282

- session-idle-mode-exit-timeout = 283
- asnpc-ms-power-down-nwexit = 284
- asnpc-r4-nwexit-recd = 285
- sgsn-iu-rel-before-call-est = 286
- ikev2-subscriber-ipsecmgr-death = 287
- All-dynamic-pool-addr-occupied = 288
- mip6ha-ip-addr-not-available = 289
- bs-monitor-keep-alive-failed = 290
- sgsn-att-in-reg-state = 291
- sgsn-inbound-srns-in-reg-state = 292
- dt-ggsn-tun-reestablish-failed = 293
- sgsn-unknown-pdp = 294
- sgsn-pdp-auth-failure = 295
- sgsn-duplicate-pdp-context = 296
- sgsn-no-rsp-from-ggsn = 297
- sgsn-failure-rsp-from-ggsn = 298
- sgsn-apn-unknown = 299
- sgsn-serv-req-init-deact = 300
- sgsn-attach-on-attch-init-abort = 301
- sgsn-iu-rel-in-israu-init-abort = 302
- sgsn-smgr-init-abort = 303
- sgsn-mm-ctx-cleanup-init-abort = 304
- sgsn-unknown-abort = 305
- sgsn-guard-timeout-abort = 306
- vpn-bounce-dhcpip-validate-req = 307
- mipv6-id-mismatch = 308
- aaa-session-id-not-found = 309
- x1-max-retry-reached = 310
- x1-nwexit-recd = 311
- x1-dereg-req-recd = 312
- x1-remote-failure = 313
- x1x2-protocol-errors = 314
- x2-max-retry-reached = 315
- x2-nwexit-recd = 316
- x2-dereg-req-recd = 317
- x2-remote-failure = 318
- x1-pmk-key-change-failure = 319

- sa-rekeying-failure = 320
- sess-sleep-mode-entry-timeout = 321
- phsgw-non-anchor-prohibited = 322
- asnpc-pc-relocation-failed = 323
- asnpc-pc-relocation = 324
- auth\_policy\_mismatch = 325
- sa-lifetime-expiry = 326
- asnpc-del-ms-entry-recd = 327
- phspc-sleep-mode-timeout = 328
- phspc-sleep-mode-exit = 329
- phspc-sleep-mode-auth-failed = 330
- phspc-ms-power-down-nwexit = 331
- phspc-x2-nwexit-recd = 332
- invalid-nat-config = 333
- asngw-tid-entry-not-found = 334
- No-NAT-IP-Address = 335
- excessive-phs-pd-flows-cfgd = 336
- phsgw-invalid-qos-configuration = 337
- Interim-Update = 338
- sgsn-attach-abrt-rad-lost = 339
- sgsn-inbnd-irau-abrt-rad-lost = 340
- ike-keepalive-failed = 341
- sgsn-attach-abrt-ms-suspend = 342
- sgsn-inbnd-irau-abrt-ms-suspend = 343
- duplicate-session-detected = 344
- sgsn-xid-response-failure = 345
- sgsn-nse-cleanup = 346
- sgsn-gtp-req-failure = 347
- sgsn-imsi-mismatch = 348
- sgsn-bvc-blocked = 349
- sgsn-attach-on-inbound-irau = 350
- sgsn-attach-on-outbound-irau = 351
- sgsn-incorrect-state = 352
- sgsn-t3350-expiry = 353
- sgsn-page-timer-expiry = 354
- phsgw-tid-entry-not-found = 355
- phspc-del-ms-entry-recd = 356

- sgsn-pdp-local-purge = 357
- phs-invalid-nai = 358
- session-sleep-mode-exit-timeout = 359
- sgsn-offload-phase2 = 360
- phs-thirdparty-auth-fail = 361
- remote-error-notify = 362
- no-response = 363
- PDG-Auth-failed = 364
- mme-s1AP-send-failed=365
- mme-egtpc-connection-failed=366
- mme-egtpc-create-session-failed=367
- mme-authentication-failure=368
- mme-ue-detach=369
- mme-mme-detach=370
- mme-hss-detach=371
- mme-pgw-detach=372
- mme-sub-validation-failure=373
- mme-hss-connection-failure=374
- mme-hss-user-unknown=375
- dhcp-lease-mismatch-detected=376
- nemo-link-layer-down=377
- eapol-max-retry-reached = 378
- sgsn-offload-phase3 = 379
- mbms-bearer-service-disconnect = 380
- disconnect-on-violation-odb = 381
- disconn-on-violation-focs-odb = 382
- CSCF-REG-Admin-disconnect = 383
- CSCF-REG-User-disconnect = 384
- CSCF-REG-Inactivity-timeout = 385
- CSCF-REG-Network-disconnect = 386
- CSCF-Call-Admin-disconnect = 387
- CSCF-Call-User-disconnect = 388
- CSCF-CALL-Local-disconnect = 389
- CSCF-CALL-No-Resource = 390
- CSCF-CALL-No-Response = 391
- CSCF-CALL-Inactivity-timeout = 392
- CSCF-CALL-Media-Auth-Failure = 393

## ■ Attributes

- CSCF-REG-No-Resource = 394
- ms-unexpected-idle-mode-entry = 395
- re-auth-failed = 396
- sgsn-pdp-nse-cleanup = 397
- sgsn-mm-ctxt-gtp-no-resource = 398
- unknown-apn = 399
- gtpc-path-failure = 400
- gtpu-path-failure = 401
- actv-rejected-by-sgsn = 402
- sgsn-pdp-gprs-camel-release = 403
- sgsn-check-imei-failure = 404
- sgsn-sndcp-init-deact = 405
- sgsn-pdp-inactivity-timeout = 406
- fw-and-nat-policy-removed = 407
- FNG-Auth-failed = 408
- ha-stale-key-disconnect = 409
- No-IPV6-address-for-subscriber = 410
- prefix-registration-failure = 411
- disconnect-from-policy-server = 412
- s6b-auth-failed = 413
- gtpc-err-ind = 414
- gtpu-err-ind = 415
- invalid-pdn-type = 416
- aaa-auth-req-failed = 417
- apn-denied-no-subscription = 418
- Sgw-context-replacement = 419
- dup-static-ip-addr-req = 420
- apn-restrict-violation = 421
- invalid-wapn = 422
- ttg-nsapi-allocation-failed = 423
- mandatory-gtp-ie-missing = 424
- aaa-unreachable = 425
- asngw-service-flow-deletion = 426
- CT-PMIP-RRQ-NVSE-Value-Change = 427
- tcp-read-failed = 428
- tcp-write-failed = 429
- ssl-handshake-failed = 430

- ssl-renegotiate-failed = 431
- ssl-bad-message = 432
- ssl-alert-received = 433
- ssl-disconnect = 434
- ssl-migration = 435
- sgsn-ard-failure = 436
- sgsn-camel-release = 437
- Hotlining-Status-Change=447
- ggsn-no-rsp-from-sgsn = 448
- diameter-protocol-error=449
- diameter-request-timeout=450
- operator-policy=451
- spr-connection-timeout=452
- miph-a-dup-wimax-session = 453
- invalid-version-attr = 454
- sgsn-zone-code-failure = 455
- invalid-qci = 456
- no\_rules = 457
- mme-init-ctxt-setup-failure = 459
- mme-driver-initiated = 460
- mme-s1ap-connection-down = 461
- mme-s1ap-reset-recd = 462
- mme-s6a-response-timeout = 463
- mme-s13-response-timeout = 464
- mme-Illegal-equipment = 465
- mme-unexpected-attach = 466
- mme-sgw-selection-failure = 467
- mme-pgw-selection-failure = 468
- mme-reselection-to-sgsn = 469
- mme-relocation-to-sgsn = 470
- mme-reselection-to-mme = 471
- mme-relocation-to-mme = 472
- mme-tau-attach-collision = 473
- mme-old-sgsn-resolution-failure = 474
- mme-old-mme-resolution-failure = 475
- mme-reloc-ho-notify-timeout = 476
- mme-reloc-ho-req-ack-timeout = 477

## ■ Attributes

- mme-create-session-timeout = 478
- mme-create-session-failure = 479
- mme-s11-path-failure = 480
- mme-policy-no-ue-irat = 481
- mme-x2-handover-failed = 482
- mme-attach-restrict = 483
- mme-regional-zone-code = 484
- mme-no-response-from-ue = 485
- mme-sgw-relocation-failed = 486
- mme-implicit-detach = 487
- sgsn-detach-notify = 488
- policy-initiated-release = 489

---

## SN1-DNS-Proxy-Intercept-List

DNS proxy list.

**Type**

26

**Vendor ID**

8164

**VSA Type**

214

**Length**

1–253

**Value**

String

---

## SN1-DNS-Proxy-Use-Subscr-Addr

This attribute is used to convey whether to use the subscriber's address as the source address for DNS Proxy.

**Type**

26

**Vendor ID**

8164

**VSA Type**

25

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disable = 0
- Enable = 1

---

## SN1-Dynamic-Addr-Alloc-Ind-Flag

This attribute indicates that the PDP address has been dynamically allocated for that particular PDP context. This field is missing if the address is static (e.g., part of the PDP context subscription). Dynamic address allocation might be relevant for charging (e.g., the duration of PDP context as one resource offered and possibly owned by the network operator).

**Type**

26

**Vendor ID**

8164

**VSA Type**

141

**Length**

1

**Value**

Integer.

Dynamic address allocation = 1

---

## SN1-Ecs-Data-Volume

Compound attribute indicating downlink and uplink octet usage for a PDP context per rating group.

**Type**

26

**Vendor ID**

8164

**VSA Type**

176

**Length**

12

**Value**

Contains the following subattributes:

---

### Rating-Group-Id

Rating Group Id in a PDP context.

**Type**

1

**Length**

4

**Value**

**■ Attributes**


---

Unsigned integer

**GPRS-Uplink**

Uplink octet usage for a PDP context per rating group.

**Type**

2

**Length**

4

**Value**

Unsigned integer

**GPRS-Downlink**

Downlink octet usage for a PDP context per rating group.

**Type**

3

**Length**

4

**Value**

Unsigned integer

---

**SN1-Enable-QoS-Renegotiation**

This attribute configures the enabling of dynamic QoS renegotiation.

**Type**

26

**Vendor ID**

8164

**VSA Type**

144

**Length**

1

**Value**

Enumerated integer. Supported values are:

- No = 0
- Yes = 1

---

**SN1-Ext-Inline-Srvr-Context**

This attribute configures the context name in which the External In-line server resides. The value is an ASCII string naming the In-line Server Context.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	41
<b>Length</b>	1–247
<b>Value</b>	ASCII string

---

## SN1-Ext-Inline-Srvr-Down-Addr

This attribute configures the IP address of the Downstream External In-line server to forward VLAN-tagged packets to. It can be tagged, in which case it is treated as part of an external in-line server group.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	56
<b>Length</b>	4
<b>Value</b>	IPv4 address

---

## SN1-Ext-Inline-Srvr-Down-VLAN

This attribute configures the IP address of the downstream external in-line server to forward VLAN-tagged packets to. It can be tagged, in which case it is treated as part of an external in-line server group.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	59
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## SN1-Ext-Inline-Srvr-Preference

This attribute configures the preference for the tagged group of External In-line Servers. This attribute is required, although it doesn't actually assign a preference right now. It can be tagged, in which case it is treated as part of an external in-line server group.

**Type**

26

**Vendor ID**

8164

**VSA Type**

57

**Length**

4

**Value**

Unsigned integer

---

## SN1-Ext-Inline-Srvr-Up-Addr

This attribute configures the IP address of the Upstream External In-line server to forward VLAN-tagged packets to. It can be tagged, in which case it is treated as part of an external in-line server group.

**Type**

26

**Vendor ID**

8164

**VSA Type**

55

**Length**

4

**Value**

IPv4 address

---

## SN1-Ext-Inline-Srvr-Up-VLAN

This attribute configures the VLAN tag to be applied to Upstream packets and forwarded to the External In-line server. It can be tagged, in which case it is treated as part of an external in-line server group.

**Type**

26

**Vendor ID**

8164

**VSA Type**

58

**Length**

4

**Value**

The VLAN tag to apply.

---

## SN1-Firewall-Enabled

Firewall for subscriber enabled.

**Type**

26

**Vendor ID**

8164

**VSA Type**

198

**Length**

4

**Value**

Enumerated integer. Supported values are:

- False = 0
- True = 1

---

## SN1-Firewall-Policy

This attribute is obsoleted.

---

## SN1-FMC-Location

MAC address and CDMA location information.

**Type**

26

**Vendor ID**

8164

**VSA Type**

171

**Length**

1–247

**Value**

String

---

## SN1-GGSN-MIP-Required

This attribute specifies if MIP is required for the GGSN subscriber.

**Type**

26

**Vendor ID**

8164

**VSA Type**

68

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0
- Enabled = 1

---

## SN1-Gratuitous-ARP-Aggressive

This attribute specifies whether to generate a gratuitous ARP message whenever a MIP handoff or re-registration occurs. A non-zero of this attribute also configures the mode of operation when sending the gratuitous ARP, although only one mode (Aggressive) is supported at this time.

**Type**

26

**Vendor ID**

8164

**VSA Type**

54

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0
- Enabled = 1

---

## SN1-Gratuitous-ARP-Mode

This attribute specifies whether to generate a gratuitous ARP message whenever a MIP handoff or re-registration occurs. A non-zero of this attribute also configures the mode of operation when sending the gratuitous ARP, although only one mode (Aggressive) is supported at this time.

**Type**

26

<b>Vendor ID</b>	8164
<b>VSA Type</b>	54
<b>Length</b>	4
<b>Value</b>	<p>An integer in network order. Supported values are:</p> <ul style="list-style-type: none"> <li>• Disabled = 0 — Do not send Gratuitous ARP</li> <li>• Aggressive = 1 — Send Gratuitous ARP in Aggressive mode</li> </ul>

---

## SN1-GTP-Version

This attribute contains the version of GTP the subscriber is using.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	62
<b>Length</b>	4
<b>Value</b>	<p>Enumerated integer. Supported values are:</p> <ul style="list-style-type: none"> <li>• GTP_VERSION_0 = 0</li> <li>• GTP_VERSION_1 = 1</li> <li>• GTP_VERSION_2 = 2</li> </ul>

---

## SN1-HA-Send-DNS-Address

This attribute specifies if the HA should send the DNS address in the Mobile IP RRP message. The default is not to send the DSN Address.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	47
<b>Length</b>	4
<b>Value</b>	

**■ Attributes**

Enumerated integer. Supported values are:

- Disabled = 0 — Do not send
- Enabled = 1 — Send

---

## SN-Home-Behavior

This attribute specifies the configuration for the behavior bits settings for a home subscriber in an APN.

When GGSN is configured to reject the charging characteristics sent by the SGSN for “home” subscribers, it uses the profile index specified by **cc-home behavior <bits> profile <index>** command to determine the appropriate CCs to use.

Multiple behavior bits can be configured for a single profile index by “Or”ing the bit strings together and convert the result to hexadecimal. The properties of the actual CC profile index are configured as part of the GGSN service using the cc profile command.

If this AVP is present in Access Accept message the locally configured APN value will be overridden.

**Type**

26

**Vendor ID**

8164

**VSA Type**

119

**Length**

4

**Value**

Unsigned integer

---

## SN1-Home-Behavior

This attribute specifies the configuration for the behavior bits settings for a home subscriber in an APN.

When GGSN is configured to reject the charging characteristics sent by the SGSN for “home” subscribers, it uses the profile index specified by **cc-home behavior <bits> profile <index>** command to determine the appropriate CCs to use.

Multiple behavior bits can be configured for a single profile index by “Or”ing the bit strings together and convert the result to hexadecimal. The properties of the actual CC profile index are configured as part of the GGSN service using the cc profile command.

If this AVP is present in Access Accept message the locally configured APN value will be overridden.

**Type**

26

**Vendor ID**

8164

**VSA Type**

119

**Length**

4

**Value**

Unsigned integer

## SN1-Home-Profile

This attribute specifies the configuration for the profile bits settings for a home subscriber in an APN.

If this AVP is present in Access Accept message the locally configured APN value will be overridden.

**Type**

26

**Vendor ID**

8164

**VSA Type**

109

**Length**

4

**Value**

Unsigned integer

## SN1-Home-Sub-Use-GGSN

This attribute configures GGSN to accept GGSN's charging characteristics for home subscribers defined for the APN.

If this AVP is present in Access Accept message the locally configured APN value will be overridden.

**Type**

26

**Vendor ID**

8164

**VSA Type**

106

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Deny = 0
- Accept = 1

## SN1-Ignore-Unknown-HA-Addr-Err

Value of 1 enables HA to ignore unknown HA address error for incoming RRQ.

**Type**

## ■ Attributes

26

**Vendor ID**  
8164**VSA Type**  
160**Length**  
1**Value**  
Unsigned integer

## SN1-IMSI

This is the IMSI that identifies the mobile subscriber.

**Type**  
26**Vendor ID**  
8164**VSA Type**  
252**Length**  
1–8**Value**  
ASCII string

## SN1-IMS-AM-Address

IMS application manager address.

**Type**  
26**Vendor ID**  
8164**VSA Type**  
167**Length**  
4**Value**  
IPv4 address

## SN1-IMS-AM-Domain-Name

IMS application manager domain name.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	168
<b>Length</b>	1 - 64
<b>Value</b>	String

---

## SN1-Internal-SM-Index

GGSN charging service, internally used.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	122
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## SN1-Inactivity-Time

This attribute contains the inactivity time duration for a subscriber session under long time duration timer configuration.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	275
<b>Length</b>	1
<b>Value</b>	1

## SN1-IP-Alloc-Method

This attribute specifies the method for allocating an IP address. This feature only applies to the GGSN Service.

**Type**

26

**Vendor ID**

8164

**VSA Type**

53

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Alloc\_Local\_Pool = 0
- Alloc\_Dhcp\_Client = 1
- Alloc\_Radius = 2
- Alloc\_No\_Alloc = 3
- Alloc\_Static\_Alloc = 4
- Alloc\_Dhcp\_Relay = 5

## SN1-IP-Filter-In

This attribute is deprecated. To select an IP access list that is already defined in the destination context, use the IETF standard **Filter-Id** attribute. The filter ID is used to identify the IP access list by name.

## SN1-IP-Filter-Out

This attribute is deprecated. To select an IP access list that is already defined in the destination context, use the IETF standard **Filter-Id** attribute. The filter ID is used to identify the IP access list by name.

## SN1-IP-Header-Compression

Specifies the IP header compression method to use.

**Type**

Type 26

**Vendor ID**

8164

**VSA Type**

150

**Length**

2

**Value**

Enumerated integer. Supported values are:

- None = 0
- VJ = 1
- ROHC = 2
- VJ\_ROHC = 3

---

## SN1-IP-Hide-Service-Address

This attribute prevents the IP address bound to a call service from responding to ping and ICMP error packets.

**Type**

26

**Vendor ID**

8164

**VSA Type**

60

**Length**

4

**Value**

Enumerated integer. Supported values are:

- No = 0
- Yes = 1

---

## SN1-IP-In-ACL

This attribute contains a definition for one Input IP Access Control List, which is used to filter the IP packets coming from the user. Note that more than one of these attributes can be included, in which case they are processed in the order in which they appear in the RADIUS Access-Accept.

**Type**

26

**Vendor ID**

8164

**VSA Type**

17

**Length**

1–253

**Value**

ASCII string

## ■ Attributes

---

## SN1-IP-In-Plcy-Grp

This attribute specifies the name of the policy group config applied in the uplink direction.

**Type**

26

**Vendor ID**

8164

**VSA Type**

193

**Length**

1–16

**Value**

String.

---

## SN1-IP-Out-ACL

This attribute contains a definition for one Output IP Access Control List, which is used to filter the IP packets sent to the user. Note that more than one of these attributes can be included, in which case they are processed in the order in which they appear in the RADIUS Access-Accept.

**Type**

26

**Vendor ID**

8164

**VSA Type**

18

**Length**

1–253

**Value**

ASCII string

---

## SN1-IP-Out-Plcy-Grp

This attribute specifies the name of the policy group config applied in the downlink direction.

**Type**

26

**Vendor ID**

8164

**VSA Type**

194

**Length**

1–16

**Value**

String.

---

## SN1-IP-Pool-Name

This attribute contains the name of the IP pool, configured on the chassis, from which an IP address should be chosen for the user.

**Type**

26

**Vendor ID**

8164

**VSA Type**

8

**Length**

1-253

**Value**

ASCII string

---

## SN1-IP-Source-Validation

This attribute indicates if the source IP address should be validated before forwarding the IP packet.

**Type**

26

**Vendor ID**

8164

**VSA Type**

14

**Length**

4

**Value**

Enumerated integer. Supported values are:

- No = 0 — No Validation
- Yes = 1 — Validated
- VSA1 vendor specific.

---

## SN1-IP-Source-Violate-No-Acct

This attribute excludes the Source Violated IP packets and byte counts when reporting the Octet and Packet count in an accounting message.

If this AVP is present in Access Accept message the locally configured APN value will be overridden. If there is no value configured in the APN this value will not be applied to the session.

**Type**

## ■ Attributes

26

**Vendor ID**

8164

**VSA Type**

196

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0
- Enabled = 1

## SN1-IP-Src-Valid-Drop-Limit

Maximum number of packet drops entertained before disconnecting the session for source violated packets for the session

**Type**

26

**Vendor ID**

8164

**VSA Type**

110

**Length**

1

**Value**

Unsigned integer

## SN1-IPv6-DNS-Proxy

IPV6 DNS Proxy Enabled or Disabled Setting for the session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

126

**Length**

2

**Value**

Enumerated integer. Supported values are:

- Disabled = 0
- Enabled = 1

---

## SN1-IPv6-Egress-Filtering

This attribute enables egress filtering to make sure that packets being sent to the mobile device have an interface ID that matches that of the mobile device. This feature is meant to protect the Mobile from receiving unwanted packets from the Internet.

**Type**

26

**Vendor ID**

8164

**VSA Type**

103

**Length**

1

**Value**

Enumerated integer. Supported values are:

- Disabled = 0
- Enabled = 1

---

## SN1-IPv6-Min-Link-MTU

SN1-IPv6-Min-Link-MTU

**Type**

26

**Vendor ID**

8164

**VSA Type**

136

**Length**

2

**Value**

Unsigned integer

---

## SN1-IPv6-num-rtr-advt

This attribute contains the IPv6 number of Initial Router Advertisements. Default value is 3.

**Type**

26

**Vendor ID**

8164

**VSA Type**

97

**■ Attributes****Length**

4

**Value**

Unsigned integer

## SN1-IPv6-Primary-DNS

This attribute specifies a Primary DNS server address that the Router Advertisement message sent by the PDSN will include.

**Type**

26

**Vendor ID**

8164

**VSA Type**

101

**Length**

4

**Value**

IPv6 address

## SN1-IPv6-rtr-advt-interval

This attribute contains the IPv6 Initial Router Advertisement Interval, specified in milliseconds. The default value is 3000.

**Type**

26

**Vendor ID**

8164

**VSA Type**

96

**Length**

4

**Value**

Unsigned integer

## SN1-IPv6-Sec-Pool

This attribute contains the IPv6 secondary pool name.

**Type**

26

**Vendor ID**

8164

**VSA Type**

124

**Length**

1–253

**Value**

String

---

## SN1-IPv6-Sec-Prefix

IPv6 Secondary Pool name prefix.

**Type**

26

**Vendor ID**

8164

**VSA Type**

125

**Length**

2–18

**Value**

Opaque value

---

## SN1-IPv6-Secondary-DNS

This attribute specifies a Secondary DNS server address that the Router Advertisement message sent by the PDSN will include.

**Type**

26

**Vendor ID**

8164

**VSA Type**

102

**Length**

4

**Value**

IPv6 address

---

## SN1-L3-to-L2-Tun-Addr-Policy

This attribute specifies the address allocation policy.

**Type**

26

**Vendor ID**

**■ Attributes**

8164

**VSA Type**

43

**Length**

4

**Value**

Enumerated integer. Supported values are:

- no-local-alloc-validate = 0 — Do not locally allocate, do not validate
- local-alloc = 1 — Locally allocate
- local-alloc-validate = 2 — Locally allocate and validate

## SN1-Local-IP-Address

This attribute contains the IP address of the local interface on the chassis for the user's session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

13

**Length**

4

**Value**

IPv4 address

## SN1-Long-Duration-Action

This attribute specifies the action to take place when the long duration timeout expires for a subscriber session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

45

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Detection = 1 — Detect the session and alert the administrator
- Disconnection = 2 — Disconnect the session
- Dormant-Only-Disconnection = 3

- Dormant-Only-Detection = 4

---

## SN1-Long-Duration-Notification

Long Duration Notification.

**Type**

26

**Vendor ID**

8164

**VSA Type**

253

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Suppress = 0
- Send = 1

---

## SN1-Long-Duration-Timeout

This attribute is used to detect and if necessary disconnect sessions connected to the PDSN. This attribute configures the time period before either alerting the administrator or disconnecting the subscriber.

**Type**

26

**Vendor ID**

8164

**VSA Type**

44

**Length**

4

**Value**

An integer in network order which is the number of seconds for the long duration timer.

---

## SN1-Mediation-Acct-Rsp-Action

When this attribute is set to **None**, there is no action taken while waiting for a response for the accounting start message from the Mediation Accounting server. When this attribute is set to **No-Early-PDUs** the system buffers all packets from the user (uplink) until a response for the accounting start message is received from the Mediation Accounting server. When set to **Delay\_GTP\_Response**, the system does not send a GTP create PDP response to the GGSN until a response for the accounting start message is received from the Mediation Accounting server. If the AVP is not present in Access Accept message or if the AVP value is invalid, the value “**None**” is assumed.

**Type**

## ■ Attributes

26

**Vendor ID**

8164

**VSA Type**

105

**Length**

4

**Value**

Enumerated integer. Supported values are:

- None = 0
- No\_Early\_PDUs = 1
- Delay\_GTP\_Response = 2

## SN1-Mediation-Enabled

This attribute indicates whether the Mediation Accounting configuration is enabled or disabled for GGSN.

If the AVP is not present in Access Accept message or if the AVP value is invalid, the locally configured APN value will be used.

**Type**

26

**Vendor ID**

8164

**VSA Type**

123

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0
- Enabled = 1

## SN1-Mediation-No-Interims

This attribute is used to disable or enable Mediation Interim Accounting Records for the session.

If this AVP is not present in Access Accept message or if the AVP value is invalid, the locally configured APN value will be used.

**Type**

26

**Vendor ID**

8164

**VSA Type**

146

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0
- Enabled = 1

---

## SN1-Mediation-VPN-Name

This attribute specifies the Mediation Context name for the session.

If this AVP is not received in the Access Accept message or if the AVP value is invalid, the locally configured APN value will be used.

**Type**

26

**Vendor ID**

8164

**VSA Type**

104

**Length**

1–128

**Value**

String

---

## SN1-Min-Compress-Size

This attribute contains the minimum size (in octets) a data packet can have in order to be compressed.

**Type**

26

**Vendor ID**

8164

**VSA Type**

23

**Length**

4

**Value**

Unsigned integer

---

## SN1-MIP-AAA-Assign-Addr

This attribute specifies if the PDSN/FA will allow AAA to assign the home address. The default is to not allow AAA to assign the home address.

**Type**

26

**Vendor ID**

8164

**VSA Type**

50

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0 — Do not allow AAA to assign home address
- Enabled = 1 — Allow AAA to assign home address

---

## SN1-MIP-ANCID

Accounting correlation ID created by IPGW, received by VBM and HBM.

**Type**

26

**Vendor ID**

8164

**VSA Type**

166

**Length**

12

**Value**

Opaque value

---

## SN1-MIP-Dual-Anchor

Enable/disable dual-anchor service for a subscriber.

**Type**

26

**Vendor ID**

8164

**VSA Type**

165

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0
- Enabled = 1

## SN1-MIP-HA-Assignment-Table

MIP-HA Assignment Table name. When this is received in an Access Accept message, the system uses this local table to get the HA Address.

**Type**

26

**Vendor ID**

8164

**VSA Type**

154

**Length**

1–253

**Value**

ASCII string

## SN1-MIP-Match-AAA-Assign-Addr

This attribute specifies if the PDSN/FA will enforce that a non-zero AAA-specified home address must match the home address present in the MIP RRQ from the mobile node, and disconnect the subscriber session if a match is not present. The default is not to force the addresses to match.

**Type**

26

**Vendor ID**

8164

**VSA Type**

51

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0 — Do not force the AAA-specified home address to match RRQ
- Enabled = 1 — Force the AAA-specified home address to match RRQ

## ■ Attributes

---

## SN1-MIP-Reg-Lifetime-Realm

Configure the maximum MIP registration lifetime for a subscriber/realm.

**Type**

26

**Vendor ID**

8164

**VSA Type**

175

**Length**

2

**Value**

Unsigned integer

---

## SN1-MIP-Send-Ancid

AAA attribute to enable/disable sending ANCID from FA to HA in MIP RRQ.

**Type**

26

**Vendor ID**

8164

**VSA Type**

163

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0
- Enabled = 1

---

## SN1-MIP-Send-Correlation-Info

This attribute enables/disables sending of correlation-id from FA to HA in MIP RRQ.

**Type**

26

**Vendor ID**

8164

**VSA Type**

188

**Length**

4

**Value**

Enumerated integer. In StarOS 8.1 and earlier, supported values are:

- Disabled = 0
- Enabled = 1

In StarOS 8.3 and later, supported values are:

- Disabled = 0
- NVSE\_Starent = 1
- NVSE\_Custom1 = 2
- NVSE\_Custom2 = 3

## SN1-MIP-Send-Imsi

Attribute to enable/disable sending IMSI from FA to HA in MIP RRQ.

**Type**

26

**Vendor ID**

8164

**VSA Type**

164

**Length**

4

**Value**

Enumerated integer. In StarOS 8.1 and earlier, supported values are:

- None = 0
- Starent\_NVSE = 1
- Custom1\_NVSE = 2

In StarOS 8.3 and later, supported values are:

- Disabled = 0,
- NVSE\_Starent = 1,
- NVSE\_Custom1 = 2,
- NVSE\_Custom2 = 3

## SN1-MIP-Send-Term-Verification

This attribute specifies whether the PDSN/FA should send the Terminal Verification Normal Vendor/Organization Specific Extension (NVSE) in the Mobile IP RRQ message to the HA. The default is not to send the Terminal Verification NVSE.

**Type**

26

**Vendor ID**

8164

**■ Attributes****VSA Type**

48

**Length**

4

**Value**

Enumerated integer. In StarOS 8.1 and earlier, supported values are:

- Disabled = 0 — Do not send
- Enabled = 1 — Send

In StarOS 8.3 and later, supported values are:

- Disabled = 0
- NVSE\_Custom1 = 1 — Send custom NVSE
- NVSE\_Custom2 = 2 — Send custom NVSE
- NVSE\_Starent = 3 — Send custom NVSE

## SN1-MN-HA-Hash-Algorithm

This attribute contains the hash algorithm to use for MN-HA authentication.

**Type**

26

**Vendor ID**

8164

**VSA Type**

28

**Length**

4

**Value**

Enumerated integer. Supported values are:

- MD5 = 1
- MD5-RFC2002 = 2
- HMAC-MD5 = 3

## SN1-MN-HA-Timestamp-Tolerance

This attribute contains the duration of timestamp tolerance, in seconds, to use for MN-HA authentication.

**Type**

26

**Vendor ID**

8164

**VSA Type**

30

**Length**

4

**Value**

Unsigned integer

---

## SN1-MS-ISDN

SN1-MS-ISDN.

**Type**

26

**Vendor ID**

8164

**VSA Type**

248

**Length**

1–9

**Value**

Opaque value

---

## SN1-MSK-Lifetime

This attribute is currently not supported.

---

## SN1-NAI-Construction-Domain

This attribute specifies the domain name to use when constructing the NAI.

**Type**

26

**Vendor ID**

8164

**VSA Type**

37

**Length**

1–247

**Value**

An ASCII string specifying the domain to use when constructed NAI is used.

---

## SN1-NAT-Bind-Record

This attribute contains the NAT Binding Record.

**Type**

**■ Attributes**

26

**Vendor ID**

8164

**VSA Type**

216

**Length**

Compound

**Value**

Contains the following subattributes:

---

**NAT-IP-Address**

NAT IP Address.

**Type**

1

**Length**

4

**Value**

IPv4 address

---

**NAT-Port-Block-Start**

Start port of the port chunk.

**Type**

2

**Length**

2

**Value**

Unsigned integer

---

**NAT-Port-Block-End**

End port of the port chunk.

**Type**

3

**Length**

2

**Value**

Unsigned integer

---

**Alloc-Flag**

Port chunk status. Accepted Values are 0(De-Allocated) and 1(Allocated).

**Type**

4

**Length**

1

**Value**

Unsigned integer

**Correlation-Id**

Correlation ID.

**Type**

5

**Length**

1-253

**Value**

String

**Loading-Factor**

Indicates maximum number of users per NAT IP address.

**Type**

6

**Length**

2

**Value**

Unsigned integer

**Binding-Timer**

Port chunk hold timer.

**Type**

7

**Length**

4

**Value**

Unsigned integer

**SN1-NAT-Info-Record**

NAT-Record-Info.

This attribute is also accepted in CoA response message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

**■ Attributes**

8164

**VSA Type**

246

**Length**

Compound

**Value**

Contains the following subattributes:

---

**Framed-IP-Address**

Framed IP address.

This attribute is also accepted in CoA response message to be used in a currently active subscriber session.

**Type**

1

**Length**

4

**Value**

IPv4 address

---

**NAT-IP-Address**

NAT IP address.

This attribute is also accepted in CoA response message to be used in a currently active subscriber session.

**Type**

2

**Length**

4

**Value**

IPv4 address

---

**NAT-Port-Block-Start**

Start port of the port chunk

This attribute is also accepted in CoA response message to be used in a currently active subscriber session.

**Type**

3

**Length**

2

**Value**

Unsigned integer

---

## NAT-Port-Block-End

End port of the port chunk.

This attribute is also accepted in CoA response message to be used in a currently active subscriber session.

**Type**

4

**Length**

2

**Value**

Unsigned integer

---

## Acct-Session-Id

Accounting Session ID.

This attribute is also accepted in CoA response message to be used in a currently active subscriber session.

**Type**

5

**Length**

1-17

**Value**

String

---

## User-Name

User name.

This attribute is also accepted in CoA response message to be used in a currently active subscriber session.

**Type**

6

**Length**

1-128

**Value**

String

---

## Correlation-Id

Correlation ID.

This attribute is also accepted in CoA response message to be used in a currently active subscriber session.

**Type**

7

**Length**

## ■ Attributes

1–17

**Value**

String

## SN1-NAT-IP-Address

This attribute includes the NAT (public) IP address used for the call.

This attribute is also accepted in CoA request and response messages to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

217

**Length**

4

**Value**

IPv4 address

## SN1-NAT-IP-Address-Old

Public IP address used for the call

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

0

**Length**

4

**Value**

IPv4 address

## SN1-NPU-Qos-Priority

This attribute configures Inter-Subscriber priority Queueing based on class of service offered. Gold has highest priority and Best\_effort lowest priority. From DSCP, means the priority queueing will be done based on the DSCP marking the incoming subscriber packet carries.

**Type**

26

**Vendor ID**

8164

**VSA Type**

98

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Best\_Effort = 0
- Bronze = 1
- Silver = 2
- Gold = 3
- From\_DSCP = 4

## SN1-Ntk-Initiated-Ctx-Ind-Flag

This attribute indicates that the PDP context is network initiated. The attribute is missing for a mobile activated PDP context.

**Type**

26

**Vendor ID**

8164

**VSA Type**

142

**Length**

1

**Value**

Opaque value

## SN1-Ntk-Session-Disconnect-Flag

SN1-Ntk-Session-Disconnect-Flag.

**Type**

26

**Vendor ID**

8164

**VSA Type**

143

**Length**

4

**Value**

**■ Attributes**

Enumerated integer. Supported value is:

- Session-Disconnect = 1

---

## SN1-Ntk-Session-Disconnect-Reason

SN1-Ntk-Session-Disconnect-Reason.

**Type**

26

**Vendor ID**

8164

**VSA Type**

143

**Length**

4

**Value**

Enumerated integer. Supported value is:

- Session-Disconnect = 1

---

## SN1-Nw-Reachability-Server-Name

This attribute specifies the name of a network reachability server (defined in the destination context of the subscriber) that must respond as reachable, or the user is be redirected.

**Type**

26

**Vendor ID**

8164

**VSA Type**

65

**Length**

1–247

**Value**

An ASCII string representing the name of the Network Reachability Detection Server.

---

## SN1-Overload-Disconnect

Enables/disables the overload-disconnect feature (if 1) and disables if 0

**Type**

26

**Vendor ID**

8164

**VSA Type**

235

**Length**

4

**Value**

Unsigned Integer

---

## SN1-Overload-Disc-Connect-Time

Provides the connect time for a session. When this time expires, the session may become a candidate for disconnection.

**Type**

26

**Vendor ID**

8164

**VSA Type**

233

**Length**

1

**Value**

Integer

---

## SN1-Overload-Disc-Inact-Time

Provides inactivity time for a session after which it may become candidate for disconnection.

**Type**

26

**Vendor ID**

8164

**VSA Type**

234

**Length**

1

**Value**

Integer

---

## SN1-PDIF-MIP-Release-TIA

PDIF mobile IP release TIA.

**Type**

26

**Vendor ID**

8164

## ■ Attributes

**VSA Type**

172

**Length**

4

**Value**

Enumerated integer. Supported values are:

- No = 0
- Yes = 1

## SN1-PDIF-MIP-Required

PDIF mobile IP required.

**Type**

26

**Vendor ID**

8164

**VSA Type**

170

**Length**

4

**Value**

Enumerated Integer. Supported values are:

- No = 0
- Yes = 1

## SN1-PDIF-MIP-Simple-IP-Fallback

PDIF mobile IP simple IP fallback.

**Type**

26

**Vendor ID**

8164

**VSA Type**

173

**Length**

4

**Value**

Enumerated integer. Supported values are:

- No = 0
- Yes = 1

---

## SN1-PDSN-Correlation-Id

Correlation ID received from PDSN to HA.

**Type**  
26

**Vendor ID**  
8164

**VSA Type**  
189

**Length**  
8

**Value**  
Opaque value

---

## SN1-PDSN-Handoff-Req-IP-Addr

This attribute specifies if the PDSN should reject and terminate the subscriber session when the proposed address in IPCP by the mobile does not match the existing address in the PDSN. The default (Disabled) is not to reject these sessions.

**Type**  
26

**Vendor ID**  
8164

**VSA Type**  
46

**Length**  
4

**Value**  
Enumerated integer. Supported values are:
 

- Disabled = 0 — Do not reject
- Enabled = 1 — Reject

---

## SN1-PDSN-NAS-Id

NAS Identifier received from PDSN to HA.

**Type**  
26

**Vendor ID**  
8164

**VSA Type**  
190

**Length**

**■ Attributes**

1–253

**Value**

String

## SN1-PDSN-NAS-IP-Address

NAS IP address received from PDSN to HA.

**Type**

26

**Vendor ID**

8164

**VSA Type**

191

**Length**

4

**Value**

IPv4 address

## SN1-Permit-User-Mcast-PDUs

Specifies whether or not to let the subscriber discard multicast PDUs.

**Type**

26

**Vendor ID**

8164

**VSA Type**

134

**Length**

2

**Value**

Enumerated integer. Supported values are:

- Disabled = 0
- Enabled = 1

## SN1-PPP-Accept-Peer-v6Ifid

This attribute indicates the acceptance of the interface ID provided by peer during PPP IPv6CP if the ID is valid. The default is disabled.

**Type**

26

**Vendor ID**

8164

**VSA Type**

95

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0 — Do not accept interface ID
- Enabled = 1 — Accept interface ID

## SN1-PPP-Always-On-Vse

SN1-PPP-Always-On-Vse.

**Type**

26

**Vendor ID**

8164

**VSA Type**

130

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0
- Enabled = 1

## SN1-PPP-Data-Compression

This attribute indicates the PPP data compression algorithm to use for the PPP session. The attribute value is a bit field, and many algorithms can be specified to indicate that one of these may be chosen by the user.

**Type**

26

**Vendor ID**

8164

**VSA Type**

9

**Length**

4

**Value**

Enumerated integer. Supported values are:

- None = 0

## ■ Attributes

- Stac-LZS = 1
- MPPC = 2
- Deflate = 4

---

## SN1-PPP-Data-Compression-Mode

This attribute indicates the PPP data compression mode to use for the PPP session when PPP data compression is used.

**Type**

26

**Vendor ID**

8164

**VSA Type**

19

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Normal = 0
- Stateless = 1

---

## SN1-PPP-Keepalive

This attribute indicates the interval for the PPP keepalive, in seconds.

**Type**

26

**Vendor ID**

8164

**VSA Type**

16

**Length**

4

**Value**

Unsigned integer

---

## SN1-PPP-NW-Layer-IPv4

This attribute indicates the PPP IPCP negotiation for IPv4. The default is enabled.

**Type**

26

**Vendor ID**

8164

**VSA Type**

92

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0 — IPCP negotiation for IPv4 is disabled.
- Enabled = 1 — IPCP negotiation for IPv4 is enabled.
- Passive = 2 — Start the negotiation only if peer initiates it.

## SN1-PPP-NW-Layer-IPv6

This attribute indicates the PPP IPv6CP negotiation for IPv6. The default is enabled.

**Type**

26

**Vendor ID**

8164

**VSA Type**

93

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0 — IPCP negotiation for IPv6 is disabled.
- Enabled = 1 — IPCP negotiation for IPv6 is enabled.
- Passive = 2 — Start the negotiation only if peer initiates it.

## SN1-PPP-Outbound-Password

This attribute indicates the password to be used when the user side of the PPP connection requires authentication.

**Type**

26

**Vendor ID**

8164

**VSA Type**

15

**Length**

1–253

**Value**

ASCII string

## SN1-PPP-Outbound-Username

This attribute indicates the username to be used when the user side of the PPP connection requires authentication.

**Type**

26

**Vendor ID**

8164

**VSA Type**

61

**Length**

1–253

**Value**

ASCII string

## SN1-PPP-Progress-Code

This attribute provides information about the “state” of the PPP connection, when the connection was terminated.

**Type**

26

**Vendor ID**

8164

**VSA Type**

4

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Not-Defined = 0
- Call-Lcp-Down = 10
- Call-Disconnecting = 20
- Call-Ppp-Renegotiating = 30
- Call-Arrived = 40
- Call-Pdg-Tcp-Connecting = 45
- Call-Pdg-Ssl-Connecting = 46
- Call-Lcp-Up = 50
- Call-Authenticating = 60
- Call-Bcmcs-Authenticating = 70
- Call-Authenticated = 80
- Call-Tunnel-Connecting = 85
- Call-Ipcp-Up = 90

- Call-Imsa-Authorizing = 95
- Call-Imsa-Authorized = 97
- Call-MBMS-UE-Authorizing = 98
- Call-MBMS-Bearer-Authorizing = 99
- Call-Simple-IP-Connected = 100
- Call-Mobile-IP-Connected = 110
- Call-Tunnel-Connected = 115
- Call-Pdp-Type-IP-Connected = 120
- Call-Pdp-Type-IPv6-Connected = 125
- Call-Pdp-Type-PPP-Connected = 130
- Call-Proxy-Mobile-IP-Connected = 140
- Call-Pdg-Connected = 142
- Call-Pdg-Ssl-Connected = 141
- Call-Pdg-Connected = 142
- Call-Pdg-Connected = 142
- Call-Ipsg-Connected = 145
- Call-Bcmcs-Connected = 150
- Call-MBMS-UE-Connected = 155
- Call-MBMS-Bearer-Connected = 156
- Call-Pending-Addr-From-DHCP = 160
- Call-Got-Addr-From-DHCP = 170
- Call-HA-IPSEC-Tunnel-Connecting = 180
- Call-HA-IPSEC-Connected = 190
- Call-ASN-Non-Anchor-Connected = 200
- Call-ASNPC-Connected = 210
- Call-Mobile-IPv6-Connected = 220
- Call-PMIPv6-Connected = 221
- Call-PHSPC-Connected = 230
- Call-GTP-IPv4-Connected = 235
- Call-GTP-IPv6-Connected = 236
- Call-GTP-IPv4-IPv6-Connected = 237
- Call-SGW-Connected = 245
- Call-MME-Attached = 246
- Call-Auth-Only-Connected = 247

---

## SN1-PPP-Reneg-Disc

PPP remote renegotiate disconnect policy.

**Type**

26

**Vendor ID**

8164

**VSA Type**

187

**Length**

1

**Value**

Enumerated integer. Supported values are:

- Disc\_no = 0
- Always = 1
- NAI\_Prefix\_MSID\_Mismatch = 2

---

## SN1-Prepaid

Prepaid.

**Type**

26

**Vendor ID**

8164

**VSA Type**

128

**Length**

1

**Value**

Enumerated integer. Supported values are:

- no\_prepaid = 0
- custom\_prepaid = 1
- standard\_prepaid = 2
- wimax\_prepaid = 4

---

## SN1-Prepaid-Compressed-Count

This attribute indicates if a Pre-paid subscriber's byte usage should be counted on the basis of compressed or uncompressed byte data over the subscriber's PPP connection to the system. If not present, the default is to count uncompressed byte data.

**Type**

26

<b>Vendor ID</b>	8164
<b>VSA Type</b>	31
<b>Length</b>	4
<b>Value</b>	<p>Enumerated integer. Supported values are:</p> <ul style="list-style-type: none"> <li>• Uncompressed = 0</li> <li>• Compressed = 1</li> </ul>

---

## SN1-Prepaid-Final-Duration-Alg

For prepaid, final duration is calculated based on the algorithm specified by the value of this attribute.

If this AVP is not received in the Access Accept message or if the AVP value is invalid, the locally configured APN value will be used.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	135
<b>Length</b>	4
<b>Value</b>	<p>Enumerated integer. Supported values are:</p> <ul style="list-style-type: none"> <li>• current_time = 0</li> <li>• last-user-layer3-activity-time = 1</li> <li>• last-airlink-activity-time = 2</li> <li>• last-airlink-activity-time-last-reported = 3</li> </ul>

---

## SN1-Prepaid-Inbound-Octets

In an Access-Accept, this indicates how many additional inbound (bytes delivered to the subscriber) byte credits should be granted to the subscriber. In an Accounting- Request, this indicates how many total inbound byte credits have been granted to the subscriber. When this attribute is not present in the Access-Accept, then pre-paid usage checking is disabled on an inbound octet basis.

<b>Type</b>	26
<b>Vendor ID</b>	8164

**■ Attributes**

<b>VSA Type</b>	32
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## SN1-Prepaid-Outbound-Octets

SN1-Prepaid-Outbound-Octets.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	33
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## SN1-Prepaid-Preference

This attribute specifies whether prepaid is volume based or duration based.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	129
<b>Length</b>	1
<b>Value</b>	Enumerated integer. Supported values are: <ul style="list-style-type: none"> <li>• prepaid_duration = 0</li> <li>• prepaid_volume = 1</li> </ul>

---

## SN1-Prepaid-Profile

Do not do prepaid, regardless of the Rulebase configuration.

**Type**

26

**Vendor ID**

8164

**VSA Type**

155

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Use-Rulebase-Config = 0
- Prohibit = 1

## SN1-Prepaid-Total-Octets

In an Access-Accept, this attribute indicates how many additional byte credits (combining both inbound and outbound counts) should be granted to the subscriber. In an Accounting- Request, this indicates how many total bytes credits (combined inbound and outbound) have been granted to the subscriber. When this attribute is not present in the Access-Accept, then pre-paid usage checking is disabled on a combined inbound and outbound octet-count basis.

**Type**

26

**Vendor ID**

8164

**VSA Type**

34

**Length**

4

**Value**

Unsigned integer

## SN1-Prepaid-Timeout

This attribute indicates how much time may elapse before a new request for more pre-paid credits is issued. If the specified time has elapsed since the prior grant of credits was received from the RADIUS server, then a new request for credits is issued. This attribute is primarily used to periodically update the subscriber of new credits issued since the subscriber was connected. Note that credit requests will still be made on behalf of the subscriber when the subscriber drops down to the low watermark of credits (or zero if there is no low watermark). The presence or absence of this attribute does not affect that mechanism in any way. However, this timer is re-set whenever any grant of credits is received on behalf of the subscriber, regardless of why the grant of credits was requested.

**Type**

26

**Vendor ID**

8164

**VSA Type**

## ■ Attributes

35

**Length**

4

**Value**

Unsigned integer

## SN1-Prepaid-Watermark

This attribute Indicates the percentage of remaining granted credits that will trigger a new request to grant credits from the RADIUS server. For example, if 1GB of credits was granted to a user, and the value of SN-Prepaid-Watermark was 10, then when 100 MB of credits are remaining (900 MB have been used) to the subscriber, a new request for any new byte credits is issued on behalf of the subscriber. Note that when calculating the pre-paid low watermark, the total credits granted for the subscriber's entire session is used.

**Type**

26

**Vendor ID**

8164

**VSA Type**

36

**Length**

4

**Value**

Unsigned integer

## SN1-Primary-DCCA-Peer

This attribute indicates the name of the primary DCCA peer and primary DCCA realm.

If the AVP is received in Access Accept message, the primary DCCA peer is used for Gy functionality. If not present in the Access Accept message or if the AVP value is invalid, the locally configured APN value will be used.

**Type**

26

**Vendor ID**

8164

**VSA Type**

223

**Length**

1-192

**Value**

A colon separated string, like "primary\_peer : primary\_realm"

---

## SN1-Primary-DNS-Server

This attribute indicates the IP address of the primary DNS server that should be used for the session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

5

**Length**

4

**Value**

IPv4 address

---

## SN1-Primary-NBNS-Server

Primary NBNS Server IP address.

**Type**

26

**Vendor ID**

8164

**VSA Type**

148

**Length**

4

**Value**

IPv4 address

---

## SN1-Proxy-MIP

This attribute specifies if the PDSN/FA will perform compulsory Proxy-MIP tunneling for a Simple-IP PDSN subscriber. This feature is licensed. The default is not to perform compulsory Proxy-MIP.

**Type**

26

**Vendor ID**

8164

**VSA Type**

52

**Length**

4

**Value**

Enumerated integer. Supported values are:

**■ Attributes**

- Disabled = 0 — Do not perform compulsory Proxy-MIP
- Enabled = 1 — Perform compulsory Proxy-MIP

---

## SN1-QoS-Background-Class

This attribute defines the QOS Background Traffic Class.

**Type**

26

**Vendor ID**

8164

**VSA Type**

91

**Length**

28 bytes

**Value**

Opaque value encoded in the following format:

- Byte 16 Bit 1 - Uplink Traffic Policing Enable/Disable
- Byte 16 Bit 2 - Downlink Traffic Policing Enable/Disable
- Byte 16 Bits 3,4 - Uplink Exceed Action
- Byte 16 Bits 5,6 - Downlink Exceed Action
- Byte 16 Bits 7,8 - Uplink Violate Action
- Byte 15 Bits 1,2 - Downlink Violate Action
- Byte 15 Bit 3 - Downlink Ext Peak Data Rate
- Byte 15 Bit 4 - Downlink Ext Committed Data Rate
- Byte 14 - Uplink Peak Data Rate
- Byte 13 - Downlink Peak Data Rate
- Byte 12 - Uplink Committed Data Rate
- Byte 11 - Downlink Committed Data Rate
- Byte 5-8 - Uplink Burst Size (in Network Byte Order)
- Byte 1-4 - Downlink Burst Size (in Network Byte Order)

---

## SN1-QoS-Class-Background-PHB

SN1-QoS-Class-Background-PHB

**Type**

26

**Vendor ID**

10415

**VSA Type**

113

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Best-Effort = 0
- Pass-Through = 1
- AF11 = 10
- AF12 = 12
- AF13 = 14
- AF21 = 18
- AF22 = 20
- AF23 = 22
- AF31 = 26
- AF32 = 28
- AF33 = 30
- AF41 = 34
- AF42 = 36
- AF43 = 38
- EF = 46

**SN1-QoS-Class-Converstional-PHB**

SN1-QoS-Class-Converstional-PHB.

**Type**

26

**Vendor ID**

10415

**VSA Type**

111

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Best-Effort = 0
- Pass-Through = 1
- AF11 = 10
- AF12 = 12
- AF13 = 14

- AF21 = 18
- AF22 = 20
- AF23 = 22
- AF31 = 26
- AF32 = 28
- AF33 = 30
- AF41 = 34
- AF42 = 36
- AF43 = 38
- EF = 46

---

## SN1-QoS-Class-Interactive-1-PHB

SN1-QoS-Class-Interactive-1-PHB

**Type**

26

**Vendor ID**

10415

**VSA Type**

114

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Best-Effort = 0
- Pass-Through = 1
- AF11 = 10
- AF12 = 12
- AF13 = 14
- AF21 = 18
- AF22 = 20
- AF23 = 22
- AF31 = 26
- AF32 = 28
- AF33 = 30
- AF41 = 34
- AF42 = 36
- AF43 = 38

- EF = 46

---

## SN1-QoS-Class-Interactive-2-PHB

SN1-QoS-Class-Interactive-2-PHB

**Type**

26

**Vendor ID**

10415

**VSA Type**

115

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Best-Effort = 0
- Pass-Through = 1
- AF11 = 10
- AF12 = 12
- AF13 = 14
- AF21 = 18
- AF22 = 20
- AF23 = 22
- AF31 = 26
- AF32 = 28
- AF33 = 30
- AF41 = 34
- AF42 = 36
- AF43 = 38
- EF = 46

---

## SN1-QoS-Class-Interactive-3-PHB

SN1-QoS-Class-Interactive-3-PHB

**Type**

26

**Vendor ID**

10415

**VSA Type**

## ■ Attributes

116

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Best-Effort = 0
- Pass-Through = 1
- AF11 = 10
- AF12 = 12
- AF13 = 14
- AF21 = 18
- AF22 = 20
- AF23 = 22
- AF31 = 26
- AF32 = 28
- AF33 = 30
- AF41 = 34
- AF42 = 36
- AF43 = 38
- EF = 46

**SN1-QoS-Class-Streaming-PHB**

SN1-QoS-Class-Streaming-PHB

**Type**

26

**Vendor ID**

10415

**VSA Type**

112

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Best-Effort = 0
- Pass-Through = 1
- AF11 = 10
- AF12 = 12
- AF13 = 14

- AF21 = 18
- AF22 = 20
- AF23 = 22
- AF31 = 26
- AF32 = 28
- AF33 = 30
- AF41 = 34
- AF42 = 36
- AF43 = 38
- EF = 46

---

## SN1-QoS-Conversation-Class

This attribute defines the QOS Conversation Traffic Class.

**Type**

26

**Vendor ID**

8164

**VSA Type**

86

**Length**

28 bytes

**Value**

Opaque value encoded in the following format:

- Byte 16 Bit 1 - Uplink Traffic Policing Enable/Disable
- Byte 16 Bit 2 - Downlink Traffic Policing Enable/Disable
- Byte 16 Bits 3,4 - Uplink Exceed Action
- Byte 16 Bits 5,6 - Downlink Exceed Action
- Byte 16 Bits 7,8 - Uplink Violate Action
- Byte 15 Bits 1,2 - Downlink Violate Action
- Byte 15 Bit 3 - Downlink Ext Peak Data Rate
- Byte 15 Bit 4 - Downlink Ext Committed Data Rate
- Byte 14 - Uplink Peak Data Rate
- Byte 13 - Downlink Peak Data Rate
- Byte 12 - Uplink Committed Data Rate
- Byte 11 - Downlink Committed Data Rate
- Byte 5-8 - Uplink Burst Size (in Network Byte Order)
- Byte 1-4 - Downlink Burst Size (in Network Byte Order)

---

## SN1-QoS-Interactive1-Class

This attribute defines the QOS Interactive Traffic Class.

**Type**

26

**Vendor ID**

8164

**VSA Type**

88

**Length**

28 bytes

**Value**

Opaque value encoded in the following format:

- Byte 16 Bit 1 - Uplink Traffic Policing Enable/Disable
- Byte 16 Bit 2 - Downlink Traffic Policing Enable/Disable
- Byte 16 Bits 3,4 - Uplink Exceed Action
- Byte 16 Bits 5,6 - Downlink Exceed Action
- Byte 16 Bits 7,8 - Uplink Violate Action
- Byte 15 Bits 1,2 - Downlink Violate Action
- Byte 15 Bit 3 - Downlink Ext Peak Data Rate
- Byte 15 Bit 4 - Downlink Ext Committed Data Rate
- Byte 14 - Uplink Peak Data Rate
- Byte 13 - Downlink Peak Data Rate
- Byte 12 - Uplink Committed Data Rate
- Byte 11 - Downlink Committed Data Rate
- Byte 5-8 - Uplink Burst Size (in Network Byte Order)
- Byte 1-4 - Downlink Burst Size (in Network Byte Order)

---

## SN1-QoS-Interactive2-Class

This attribute defines the QOS Interactive2 Traffic Class.

**Type**

26

**Vendor ID**

8164

**VSA Type**

89

**Length**

28 bytes

**Value**

Opaque value encoded in the following format:

- Byte 16 Bit 1 - Uplink Traffic Policing Enable/Disable
- Byte 16 Bit 2 - Downlink Traffic Policing Enable/Disable
- Byte 16 Bits 3,4 - Uplink Exceed Action
- Byte 16 Bits 5,6 - Downlink Exceed Action
- Byte 16 Bits 7,8 - Uplink Violate Action
- Byte 15 Bits 1,2 - Downlink Violate Action
- Byte 15 Bit 3 - Downlink Ext Peak Data Rate
- Byte 15 Bit 4 - Downlink Ext Committed Data Rate
- Byte 14 - Uplink Peak Data Rate
- Byte 13 - Downlink Peak Data Rate
- Byte 12 - Uplink Committed Data Rate
- Byte 11 - Downlink Committed Data Rate
- Byte 5-8 - Uplink Burst Size (in Network Byte Order)
- Byte 1-4 - Downlink Burst Size (in Network Byte Order)

---

## SN1-QoS-Interactive3-Class

This attribute defines the QOS Interactive3 Traffic Class.

**Type**

26

**Vendor ID**

8164

**VSA Type**

90

**Length**

28 bytes

**Value**

Opaque value encoded in the following format:

- Byte 16 Bit 1 - Uplink Traffic Policing Enable/Disable
- Byte 16 Bit 2 - Downlink Traffic Policing Enable/Disable
- Byte 16 Bits 3,4 - Uplink Exceed Action
- Byte 16 Bits 5,6 - Downlink Exceed Action
- Byte 16 Bits 7,8 - Uplink Violate Action
- Byte 15 Bits 1,2 - Downlink Violate Action
- Byte 15 Bit 3 - Downlink Ext Peak Data Rate
- Byte 15 Bit 4 - Downlink Ext Committed Data Rate
- Byte 14 - Uplink Peak Data Rate

**■ Attributes**

- Byte 13 - Downlink Peak Data Rate
- Byte 12 - Uplink Committed Data Rate
- Byte 11 - Downlink Committed Data Rate
- Byte 5-8 - Uplink Burst Size (in Network Byte Order)
- Byte 1-4 - Downlink Burst Size (in Network Byte Order)

---

## SN1-QoS-Negotiated

Negotiated QoS for GGSN sessions.

**Type**

26

**Vendor ID**

8164

**VSA Type**

147

**Length**

In 10.2 and earlier releases: 4–17

In 11.0 and later releases: 4–20

**Value**

String

---

## SN1-QoS-Renegotiation-Timeout

This attribute configures the timeout duration of dampening time for dynamic QoS renegotiation.

**Type**

26

**Vendor ID**

8164

**VSA Type**

145

**Length**

1

**Value**

1

---

## SN1-QoS-Streaming-Class

This attribute defines the QOS Streaming Traffic Class.

**Type**

26

**Vendor ID**

8164

**VSA Type**

87

**Length**

28 byte

**Value**

Opaque value encoded in the following format:

- Byte 16 Bit 1 - Uplink Traffic Policing Enable/Disable
- Byte 16 Bit 2 - Downlink Traffic Policing Enable/Disable
- Byte 16 Bits 3,4 - Uplink Exceed Action
- Byte 16 Bits 5,6 - Downlink Exceed Action
- Byte 16 Bits 7,8 - Uplink Violate Action
- Byte 15 Bits 1,2 - Downlink Violate Action
- Byte 15 Bit 3 - Downlink Ext Peak Data Rate
- Byte 15 Bit 4 - Downlink Ext Committed Data Rate
- Byte 14 - Uplink Peak Data Rate
- Byte 13 - Downlink Peak Data Rate
- Byte 12 - Uplink Committed Data Rate
- Byte 11 - Downlink Committed Data Rate
- Byte 5-8 - Uplink Burst Size (in Network Byte Order)
- Byte 1-4 - Downlink Burst Size (in Network Byte Order)

**SN1-QoS-Tp-Dnlk**

This attribute enables/disables Traffic Policing/Shaping in downlink direction.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

73

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0
- Policing = 1

## ■ Attributes

- Shaping = 2

---

## SN1-QoS-Tp-Uplk

This attribute enables/disables Traffic Policing/Shaping in uplink direction.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

79

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0
- Policing = 1
- Shaping = 2

---

## SN1-QoS-Traffic-Policy

This compound attribute simplifies sending QoS values for Traffic Class, Direction, Burst-Size, Committed-Data-Rate, Peak-Data-Rate, Exceed-Action, and Violate-Action from the RADIUS server. When the SN1-QoS-Traffic-Policy attribute is sent along with the Acct-Session-ID attribute, the system matches the particular PtDP context, and applies the new policy and retains the policy with the subscriber profile for future use. The next time the system sends a CoA request with a new policy and a different Acct-Session-ID for the same subscriber, the previously received policy is also applied to the matching PDP context along with the new policy.



**Important:** This attribute is specific to the GGSN service.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

177

**Value**

Contains the following subattributes:

---

## Direction

Direction of traffic.

**Type**

1

**Length**

1

**Value**

Unsigned integer Supported values are:

- Downlink = 0
- Uplink = 1

---

## Class

Traffic class.

**Type**

2

**Length**

1

**Value**

Unsigned integer Supported values are:

- Undefined = 0
- Conversational = 1
- Streaming = 2
- Interactive TP 1 = 4
- Interactive TP 2 = 5
- Interactive TP 3 = 6
- Background = 7

---

## Burst-Size

Peak burst size.

**Type**

3

**Length**

4

**Value**

Unsigned integer

---

## Committed-Data-Rate

Committed data rate.

<b>Type</b>	4
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## Peak-Data-Rate

Peak data rate.

<b>Type</b>	5
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## Exceed-Action

Action to take on packets that exceed the Committed-Data-Rate but do not violate the Peak-Data-Rate.

<b>Type</b>	6
<b>Length</b>	1
<b>Value</b>	Unsigned integer Supported values are: <ul style="list-style-type: none"> <li>Transmit = 0</li> <li>Drop = 1</li> <li>Lower IP Precedence = 2</li> </ul>

---

## Violate-Action

Violate action.

<b>Type</b>	7
<b>Length</b>	1
<b>Value</b>	Unsigned integer Supported values are: <ul style="list-style-type: none"> <li>Transmit = 0</li> <li>Drop = 1</li> <li>Lower IP Precedence = 2</li> <li>Buffer = 3</li> </ul>

- Buffer-Transmit-On-Full = 4

---

## Auto-Readjust-Enabled

Available only in StarOS 8.1 and later. Auto-readjust enabled.

**Type**

8

**Length**

1

**Value**

Unsigned integer

---

## Auto-Readjust-Duration

Available only in StarOS 8.1 and later. Auto-readjust duration.

**Type**

9

**Length**

4

**Value**

Unsigned integer

---

## Qci

Available only in 11.0 and later releases. QOS QCI accepted values are 1 (qci 1), 2 (qci 2), 3 (qci 3), 4 (qci 4), 5 (qci 5), 6 (qci 6), 7 (qci 7), 8 (qci 8), 9 (qci 9).

**Type**

10

**Length**

1

**Value**

Unsigned integer

---

## SN1-Rad-APN-Name

This attribute specifies the RADIUS returned APN name.

If this AVP is not present in the Access Accept message or if the AVP value is invalid, the SGSN supplied APN value in create PDP context will be used for the session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

## ■ Attributes

162

**Length**

1–64

**Value**

Opaque value

## SN1-Radius-Returned-Username

This attribute is used to prefer RADIUS returned user name over constructed username in the accounting messages.

**Type**

26

**Vendor ID**

8164

**VSA Type**

236

**Length**

4

**Value**

Enumerated integer. Supported values are:

- No = 0
- Yes = 1

## SN1-Re-CHAP-Interval

The Periodic CHAP authentication interval for PPP, in seconds.

**Type**

26

**Vendor ID**

8164

**VSA Type**

7

**Length**

4

**Value**

Integer.

## SN1-Roaming-Behavior

This attribute specifies the configuration for the behavior bits settings for a roaming subscriber in an APN.

When GGSN is configured to reject the charging characteristics sent by the SGSN for "roaming" subscribers, it uses the profile index specified by `cc-home behavior <bits> profile <index>` command to determine the appropriate CCs to use.

Multiple behavior bits can be configured for a single profile index by "Or"ing the bit strings together and convert the result to hexadecimal. The properties of the actual CC profile index are configured as part of the GGSN service using the cc profile command.

If this AVP is present in Access Accept message the locally configured APN value will be overridden.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	121
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## SN1-Roaming-Profile

This attribute specifies the configuration for the profile bits settings for a roaming subscriber in an APN.

If this AVP is present in Access Accept message the locally configured APN value will be overridden.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	118
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## SN1-Roaming-Sub-Use-GGSN

This attribute configures GGSN to accept GGSN's charging characteristics for roaming subscribers defined for the APN.

If this AVP is present in Access Accept message the locally configured APN value will be overridden.

<b>Type</b>	26
<b>Vendor ID</b>	8164

**■ Attributes****VSA Type**

108

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Deny = 0
- Accept = 1

## SN1-ROHC-Direction

Specifies in which direction to apply Robust Header Compression (ROHC).

**Type**

Type 26

**Vendor ID**

Vendor-ID 8164

**VSA Type**

VSA-Type 153

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Any = 0
- Uplink = 1
- Downlink = 2

## SN1-ROHC-Flow-Marking-Mode

Configure ROHC compression for marked flows only.

**Type**

26

**Vendor ID**

8164

**VSA Type**

216

**Length**

4

**Value**

Enumerated integer. Supported values are:

- False = 0
- True = 1

---

## SN1-ROHC-Mode

Sets the mode of operation for Robust Header Compression for IP.

**Type**

26

**Vendor ID**

8164

**VSA Type**

151

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Reliable = 0
- Optimistic = 1
- Unidirectional = 2

---

## SN1-ROHC-Profile-Name

Specifies the ROHC profile name to use for the subscriber.

**Type**

26

**Vendor ID**

8164

**VSA Type**

238

**Length**

1–64

**Value**

ASCII string

---

## SN1-Routing-Area-Id

For GGSN calls this indicates the Routing Area ID of the subscriber.

**Type**

26

**Vendor ID**

8164

**VSA Type**

249

**Length**

## ■ Attributes

3

**Value**

Opaque value

## SN1-Rulebase

When the session is active charging enabled, Rulebase name will specify one of the pre configured ECSv2 rulebases in active charging subsystem.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

If this AVP is present in Access Accept message the locally configured APN value will be overridden. If there is no value configured in the APN, this value will not be applied to the session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

249

**Length**

1–64

**Value**

String

## SN1-Secondary-DCCA-Peer

This attribute indicates the name of the Secondary DCCA peer and Secondary DCCA realm.

If this AVP is received in Access Accept message the secondary DCCA peer is used for Gy functionality. If not present in the Access Accept message or if the AVP value is invalid, the locally configured APN value will be used.

**Type**

26

**Vendor ID**

8164

**VSA Type**

224

**Length**

1–192

**Value**

A colon separated string, like “secondary\_peer : secondary\_realm”.

## SN1-Secondary-DNS-Server

This attribute indicates the IP address of the secondary DNS server that should be used for the session.

---

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	6
<b>Length</b>	4
<b>Value</b>	IPv4 address

---

## SN1-Secondary-NBNS-Server

Secondary NBNS Server IP Address.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	149
<b>Length</b>	4
<b>Value</b>	IPv4 address

---

## SN1-Service-Address

Used to send the bind IP address of the service in RADIUS messages.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	169
<b>Length</b>	4
<b>Value</b>	IPv4 address

---

## SN1-Service-Type

This attribute signifies the type that the user is accessing.

**Type**

26

**Vendor ID**

8164

**VSA Type**

24

**Length**

4

**Value**

Enumerated integer. Supported values are:

- None = 0
- PDSN = 1
- Management = 2
- HA = 3
- GGSN = 4
- LNS = 5
- IPSG = 6
- CSCF = 7
- ASNGW = 8
- PDIF = 9
- STANDALONE\_FA = 10
- SGSN = 11
- PHSGW = 12
- PDG = 13
- MIPV6HA = 14
- PGW = 15
- SGW = 16
- FNG = 17
- OGW = 18 — NOTE: Applicable only in release 12.0.
- HNBGW = 19

---

## SN1-Simultaneous-SIP-MIP

This attribute indicates if a PDSN Subscriber can simultaneously be given Simple IP and Mobile IP service.

**Type**

26

<b>Vendor ID</b>	8164
<b>VSA Type</b>	22
<b>Length</b>	4
<b>Value</b>	<p>Enumerated integer. Supported values are:</p> <ul style="list-style-type: none"> <li>• Disabled = 0</li> <li>• Enabled = 1</li> </ul>

---

## SN1-Subscriber-Acct-Mode

SN1-Subscriber-Acct-Mode

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	192
<b>Length</b>	4
<b>Value</b>	<p>Enumerated integer. Supported values are:</p> <ul style="list-style-type: none"> <li>• flow-based-auxilliary = 0</li> <li>• flow-based-all = 1</li> <li>• flow-based-none = 2</li> <li>• session-based = 3</li> <li>• main-a10-only = 4</li> </ul>

---

## SN1-Subscriber-Accounting

This attribute specifically enables or disables subscriber accounting. Note that if enabled, subscriber accounting still needs to be enabled in the subscriber's AAA context for accounting to be performed.

The AVP value 0 means no accounting; 1 indicates RADIUS accounting; and 2 indicates GTPP accounting. If an invalid value is received or if the AVP is not present in the Access Accept message, then the locally configured APN value will be used.

<b>Type</b>	26
<b>Vendor ID</b>	8164

## ■ Attributes

**VSA Type**

64

**Length**

4

**Value**

Enumerated integer. Supported values are:

- None = 0
- Radius = 1
- GTPP = 2

## SN1-Subscriber-Acct-Interim

This attribute specifies if accounting INTERIM messages are enabled for the subscriber. Note that accounting must also be globally enabled for the subscriber (SN-Subscriber-Accounting), and enabled for the subscriber's AAA context (along with a specific INTERIM interval), if accounting INTERIM messages are to be sent.

The AVP value 0 represents normal or enabled for generating accounting INTERIM messages. The value 1 represents enabled for suppressing RADIUS accounting INTERIM messages.

If the AVP is not present in the Access Accept message or if the AVP value is invalid, the value 0 is assumed.

**Type**

26

**Vendor ID**

8164

**VSA Type**

70

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Normal = 0
- Suppress = 1

## SN1-Subscriber-Acct-Rsp-Action

When this attribute is set to None, there is no action taken while waiting for a response for the accounting start message from the RADIUS server. When this attribute is set to No-Early-PDUs the system buffers all packets from the user (uplink) until a response for the accounting start message is received from the RADIUS server. When set to Delay\_GTP\_Response, the system does not send a GTP create response to the GGSN until a response for the accounting start message is received from the RADIUS server.

**Type**

26

**Vendor ID**

8164

**VSA Type**

100

**Length**

4

**Value**

Enumerated integer. Supported values are:

- None = 0
- No\_Early\_PDUs = 1
- Delay\_GTP\_Response = 2

## SN1-Subscriber-Acct-Start

This attribute specifies if accounting START messages are enabled for the subscriber. Note that accounting must also be globally enabled for the subscriber (**SN-Subscriber-Accounting**), and enabled for the subscriber's AAA context, if accounting START messages are to be sent.

The AVP value 0 represents normal or enabled for generating accounting START messages. The value 1 represents enabled for suppressing RADIUS accounting START messages.

If the AVP is not present in the Access Accept message or if the AVP value is invalid, the value 0 is assumed.

**Type**

26

**Vendor ID**

8164

**VSA Type**

69

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Normal = 0
- Suppress = 1

## SN1-Subscriber-Acct-Stop

This attribute specifies if accounting STOP messages are enabled for the subscriber. Note that accounting must also be globally enabled for the subscriber (**SN-Subscriber-Accounting**), and enabled for the subscriber's AAA context, if accounting STOP messages are to be sent.

The AVP value 0 represents normal or enabled for generating accounting STOP messages. The value 1 represents enabled for suppressing RADIUS accounting STOP messages.

If the AVP is not present in the Access Accept message or if the AVP value is invalid, the value 0 is assumed.

**Type**

26

**■ Attributes****Vendor ID**

8164

**VSA Type**

71

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Normal = 0
- Suppress = 1

---

## SN1-Subscriber-Class

Customer-requested attribute for supporting specific behavior for their subscriber billing.

**Type**

26

**Vendor ID**

8164

**VSA Type**

219

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Normal\_Subscriber = 0
- Ting\_100 = 1
- Ting\_500 = 2
- Ting\_Buddy = 3
- Ting\_Star = 4
- Ting\_Nolimit\_SMS = 5
- Kids\_Locator = 6
- Ting\_2000 = 7
- Handicapped\_Welfare = 8
- Reserved = 9

---

## SN1-Subscriber-Dormant-Activity

This attribute specifies whether to treat dormant packets routed to the mobile as activity for idle timeout purposes. The default is Enabled. Disabled means dormant packets routed to the mobile are not treated as activity for idle timeout purposes.

**Type**

26

**Vendor ID**

8164

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0
- Enabled = 1

## SN1-Subscriber-IP-Hdr-Neg-Mode

This attribute specifies whether to wait for (detect) IP header compression to be requested by the mobile before responding, or not to wait (force). Force is the default.

**Type**

26

**Vendor ID**

8164

**VSA Type**

67

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Force = 0
- Detect = 1

## SN1-Subscriber-IP-TOS-Copy

This attribute enables copying of TOS bits from outer IP headers into inner tunneled IP headers. The default is Both.

**Type**

26

**Vendor ID**

8164

**VSA Type**

85

**Length**

4

**Value**

Enumerated integer. Supported values are:

- None = 0

**■ Attributes**

- Access-Tunnel = 1
- Data-Tunnel = 2
- Both = 3

---

## SN1-Subscriber-Nexthop-Address

This attribute specifies the nexthop gateway address to be returned by AAA on a per subscriber basis.

**Type**

26

**Vendor ID**

8164

**VSA Type**

127

**Length**

6

**Value**

IPv4 address

---

## SN1-Subscriber-No-Interims

This is a GGSN specific attribute. When set to 0 (disabled) interim accounting is generated. When set to 1 (enabled) interim accounting generation is disabled.

If the AVP is not present in the Access Accept message or if the AVP value is invalid, the value 0 is assumed.

**Type**

26

**Vendor ID**

8164

**VSA Type**

133

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Enabled = 0
- Disabled = 1

---

## SN1-Subscriber-Permission

This attribute indicates the services allowed to be delivered to the subscriber. The attribute value is a bit field, and many algorithms can be specified to indicate that one of these may be chosen by the user.

**Type**

26

**Vendor ID**

8164

**VSA Type**

20

**Length**

4

**Value**

Enumerated integer. Supported values are:

- None = 0
- Simple-IP = 1
- Mobile-IP = 2
- Simple-IP-Mobile-IP = 3
- HA-Mobile-IP = 4
- Simple-IP-HA-Mobile-IP = 5
- Mobile-IP-HA-Mobile-IP = 6
- All = 7

In StarOS 8.3 and later, supported values are:

- None = 0
- Simple-IP = 1
- Mobile-IP = 2
- Simple-IP-Mobile-IP = 3
- HA-Mobile-IP = 4
- Simple-IP-HA-Mobile-IP = 5
- Mobile-IP-HA-Mobile-IP = 6
- SIP-MIP-HA-MIP = 7
- GGSN-PDP-TYPE-IP = 0x08, # see SessSubscriberPermission in sess\_common.x
- GGSN-PDP-TYPE-PPP = 0x10, # see SessSubscriberPermission in sess\_common.x
- Network-Mobility = 0x20
- FA-HA-NEMO = 0x26
- All = 0x3F

---

## SN1-Subscriber-Template-Name

RADIUS returned subscriber template.

**Type**

26

**Vendor ID**

8164

## ■ Attributes

**VSA Type**  
158

**Length**  
1–127

**Value**  
String

## SN1-Subs-Acc-Flow-Traffic-Valid

This attribute indicates the subscriber account flow traffic is valid.

**Type**  
26

**Vendor ID**  
8164

**VSA Type**  
225

**Length**  
4

**Value**  
Enumerated integer. Supported values are:

- Disable = 0
- Enable = 1

## SN1-Subs-IMSA-Service-Name

IMS Authorization Service name.

**Type**  
26

**Vendor ID**  
8164

**VSA Type**  
159

**Length**  
1–128

**Value**  
ASCII string

## SN1-Subs-VJ-Slotid-Cmp-Neg-Mode

Enable/Disable slotid compression in either direction when using VJ compression.

**Type**

26

**Vendor ID**

8164

**VSA Type**

221

**Length**

4

**Value**

Enumerated integer. Supported values are:

- None = 0
- Receive = 1
- Transmit = 2
- Both = 3

## SN1-Tp-Dnlk-Burst-Size

This attribute specifies the Traffic Policing downlink burst size in bytes.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

76

**Length**

4

**Value**

Unsigned integer

## SN1-Tp-Dnlk-Committed-Data-Rate

This attribute specifies the Traffic Policing downlink committed data rate in bps.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

74

**Length**

4

## ■ Attributes

**Value**

Unsigned integer

## SN1-Tp-Dnlk-Exceed-Action

This attribute specifies the action to take on Traffic Policing downlink packets that exceed the committed-data-rate but do not violate the peak-data-rate.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

77

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Transmit = 0
- Drop = 1
- Lower-IP-Precendence = 2
- Buffer = 3
- Transmit-On-Buffer-Full = 4

## SN1-Tp-Dnlk-Peak-Data-Rate

This attribute specifies the Traffic Policing downlink peak data rate in bps.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

75

**Length**

4

**Value**

Unsigned integer

## SN1-Tp-Dnlk-Violate-Action

This attribute specifies the action to take on Traffic Policing downlink packets that exceed both the committed-data-rate and the peak-data-rate.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

78

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Transmit = 0
- Drop = 1
- Lower-IP-Precedence = 2
- Buffer = 3
- Transmit-On-Buffer-Full = 4

## SN1-Tp-Uplk-Burst-Size

This attribute specifies the Traffic Policing uplink burst size in bytes.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

82

**Length**

4

**Value**

Unsigned integer

## SN1-Tp-Uplk-Committed-Data-Rate

This attribute specifies the Traffic Policing uplink committed data rate in bps.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

## ■ Attributes

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	80
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## SN1-Tp-Uplk-Exceed-Action

This attribute specifies the action to take on Traffic Policing uplink packets that exceed the committed-data-rate but do not violate the peak-data-rate.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	83
<b>Length</b>	4
<b>Value</b>	Enumerated integer. Supported values are:

- Transmit = 0
- Drop = 1
- Lower-IP-Precendence = 2
- Buffer = 3
- Transmit-On-Buffer-Full = 4

---

## SN1-Tp-Uplk-Peak-Data-Rate

This attribute specifies the Traffic Policing uplink peak data rate in bps.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	

81

**Length**

4

**Value**

Unsigned integer

---

## SN1-Tp-Uplk-Violate-Action

This attribute specifies the action to take on Traffic Policing uplink packets that exceed both the committed-data-rate and the peak-data-rate.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

84

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Transmit = 0
- Drop = 1
- Lower-IP-Precedence = 2
- Buffer = 3
- Transmit-On-Buffer-Full = 4

---

## SN1-Traffic-Group

This attribute is used to assign a tag to a FA or a group of FAs, so that traffic policy can be enforced based on the tag value.

**Type**

26

**Vendor ID**

8164

**VSA Type**

161

**Length**

2

**Value**

Unsigned integer

---

## SN1-Transparent-Data

This AVP is used by RADIUS to provide Global Title information for the GGSN to use in CDRs and Quota Auth.

**Type**

26

**Vendor ID**

8164

**VSA Type**

247

**Length**

In StarOS 8.1 and later: 1–247 In StarOS 8.0: 1–237

**Value**

Opaque value

---

## SN1-Tun-Addr-Policy

Describes IP address validation policy for non L2TP tunneled calls.

**Type**

26

**Vendor ID**

8164

**VSA Type**

156

**Length**

4

**Value**

Enumerated integer. Supported values are:

- no-local-alloc-validate = 0
- local-alloc = 1
- local-alloc-validate = 2

---

## SN1-Tunnel-Gn

Used to enable/disable Gn interface from PDG/TTG to GGSN.

**Type**

26

**Vendor ID**

8164

**VSA Type**

174

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Disabled = 0
- Enabled = 1

---

## SN1-Tunnel-ISAKMP-Crypto-Map

This attribute specifies the system-defined crypto map to use for the subscriber's Mobile-IP connection, when IPSec is used to protect the Mobile-IP connection. This attribute is salt-encrypted.

**Type**

26

**Vendor ID**

8164

**VSA Type**

38

**Length**

1–128

**Value**

String

---

## SN1-Tunnel-ISAKMP-Secret

This attribute specifies the secret to use for IKE.

**Type**

26

**Vendor ID**

8164

**VSA Type**

39

**Length**

1–128

**Value**

String

---

## SN1-Tunnel-Load-Balancing

Specifies the load-balancing algorithm to use when tunneling is employed.

**Type**

26

**Vendor ID**

**■ Attributes**

8164

**VSA Type**

27

**Length**

4

**Value**

Enumerated integer. Supported values are:

- random = 1
- balanced = 2
- prioritized = 3

## SN1-Tunnel-Password

This attribute contains a secret for tunneling usage. Currently this is only used for L2TP. It is recommended that if your RADIUS server supports salt-encryption of attributes, that you use the Tunnel-Password attribute instead.

**Type**

26

**Vendor ID**

8164

**VSA Type**

26

**Length**

1–247

**Value**

A bitstring which is the tunnel secret.

## SN1-Unclassify-List-Name

SN1-Unclassify-List-Name.

**Type**

26

**Vendor ID**

8164

**VSA Type**

132

**Length**

1–132

**Value**

String

---

## SN1-Virtual-APN-Name

This attribute indicates the virtual APN name.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	94
<b>Length</b>	1–64
<b>Value</b>	Opaque value

---

## SN1-Visiting-Behavior

This attribute specifies the configuration for the behavior bits settings for a visiting subscriber in an APN.

When GGSN is configured to reject the charging characteristics sent by the SGSN for "home" subscribers, it uses the profile index specified by `cc-home behavior <bits> profile <index>` command to determine the appropriate CCs to use.

Multiple behavior bits can be configured for a single profile index by "Or"ing the bit strings together and convert the result to hexadecimal. The properties of the actual CC profile index are configured as part of the GGSN service using the cc profile command.

If this AVP is present in Access Accept message the locally configured APN value will be overridden.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	120
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## SN1-Visiting-Profile

This attribute specifies the configuration for the profile bits settings for a visiting subscriber in an APN.

If this AVP is present in Access Accept message the locally configured APN value will be overridden.

<b>Type</b>	26
-------------	----

## ■ Attributes

<b>Vendor ID</b>	8164
<b>VSA Type</b>	117
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## SN1-Visiting-Sub-Use-GGSN

This attribute configures GGSN to accept GGSN's charging characteristics for visiting subscribers defined for the APN.

If this AVP is present in Access Accept message the locally configured APN value will be overridden.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	107
<b>Length</b>	4
<b>Value</b>	Enumerated integer. Supported values are: <ul style="list-style-type: none"> <li>Deny = 0</li> <li>Accept = 1</li> </ul>

---

## SN1-Voice-Push-List-Name

SN1-Voice-Push-List-Name.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	131
<b>Length</b>	1–32
<b>Value</b>	String

---

## SN1-VPN-ID

This attribute indicates the Destination VPN of the user, specified by a 32-bit identifier.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1

**Length**

4

**Value**

Unsigned integer

---

## SN1-VPN-Name

This attribute indicates the name of the user's destination VPN.

**Type**

26

**Vendor ID**

8164

**VSA Type**

2

**Length**

1–253

**Value**

ASCII string

---

## SNA-Input-Gigawords

This attribute contains the total number of input gigawords.

**Type**

26

**Vendor ID**

8164

**VSA Type**

206

**Length**

4

**Value**

Unsigned integer

---

## SNA-Output-Gigawords

This attribute contains the total number of output gigawords.

**Type**

26

**Vendor ID**

8164

**VSA Type**

207

**Length**

4

**Value**

Unsigned integer

---

## SNA-PPP-Bad-Addr

This attribute contains the total number of frames received with bad address field in the HDLC header field, for the user's PPP session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1011

**Length**

4

**Value**

Unsigned integer

---

## SNA-PPP-Bad-Ctrl

This attribute contains the total number of frames received with bad control field in the HDLC header field, for the user's PPP session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1012

**Length**

4

**Value**

Unsigned integer

---

## SNA-PPP-Bad-FCS

This attribute contains the number of frames received, for the user's PPP session, with bad FCS.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1014

**Length**

4

**Value**

Unsigned integer

---

## SNA-PPP-Ctrl-Input-Octets

This attribute contains the number of PPP Control Octets received for the user's PPP session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1001

**Length**

4

**Value**

Unsigned integer

---

## SNA-PPP-Ctrl-Input-Packets

This attribute contains the number of PPP Control packets received for the user's PPP session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1003

**Length**

4

**■ Attributes****Value**

Unsigned integer

## SNA-PPP-Ctrl-Output-Octets

This attribute contains the number of PPP Control Octets sent to the user during the user's PPP session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1002

**Length**

4

**Value**

Unsigned integer

## SNA-PPP-Ctrl-Output-Packets

This attribute contains the number of PPP Control packets sent to the user during the user's PPP session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1004

**Length**

4

**Value**

Unsigned integer

## SNA-PPP-Discards-Input

This attribute contains the number of PPP input frames that were discarded during the user's PPP session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1007

**Length**

4

**Value**

Unsigned integer

---

## SNA-PPP-Discards-Output

This attribute contains the number of PPP output frames that were discarded during the user's PPP session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1008

**Length**

4

**Value**

Unsigned integer

---

## SNA-PPP-Echo-Req-Input

This attribute contains the number of LCP echo packets received, for the user's PPP session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1015

**Length**

4

**Value**

Unsigned integer

---

## SNA-PPP-Echo-Req-Output

This attribute contains the number of LCP echo packets sent, for the user's PPP session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1016

**■ Attributes****Length**

4

**Value**

Unsigned integer

---

## SNA-PPP-Echo-Rsp-Input

This attribute contains the number of LCP echo response packets received, for the user's PPP session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1017

**Length**

4

**Value**

Unsigned integer

---

## SNA-PPP-Echo-Rsp-Output

This attribute contains the number of LCP echo response packets sent, for the user's PPP session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1018

**Length**

4

**Value**

Unsigned integer

---

## SNA-PPP-Errors-Input

This attribute contains the number of PPP input de-framing errors for the user's PPP session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1009

**Length**

4

**Value**

Unsigned integer

---

## SNA-PPP-Errors-Output

This attribute contains the number of PPP output framing errors for the user's PPP session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1010

**Length**

4

**Value**

Unsigned integer

---

## SNA-PPP-Framed-Input-Octets

This attribute contains the number of PPP octets received (without framing overhead) for the user's PPP session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1005

**Length**

4

**Value**

Unsigned integer

---

## SNA-PPP-Framed-Output-Octets

This attribute contains the number of PPP octets sent (without framing overhead) to the user during the user's PPP session.

**Type**

26

**Vendor ID**

8164

## ■ Attributes

**VSA Type**  
1006

**Length**  
4

**Value**  
Unsigned integer

## SNA-PPP-Packet-Too-Long

This attribute contains the total number of frames received, for the user's PPP session, that exceeds the MTU of the interface.

**Type**  
26

**Vendor ID**  
8164

**VSA Type**  
1013

**Length**  
4

**Value**  
Unsigned integer

## SNA-PPP-Unfr-Data-In-Gig

This attribute contains the total number of PPP gigawords without framing sent for the subscriber's session. When combined with the attribute SNA-PPP-Unfr-data-In-Oct, a 64-bit value can be formed which is the total number of PPP octets without framing send for the subscriber's session.

**Type**  
26

**Vendor ID**  
8164

**VSA Type**  
202

**Length**  
4

**Value**  
Unsigned integer

## SNA-PPP-Unfr-Data-Out-Gig

This attribute contains the total number of PPP octets without framing received for the user's session. When combined with the attribute SNA-PPP-Unfr-data-In-Oct, a 64-bit value can be formed which is the total number of PPP octets without framing received for the subscriber's session.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	203
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## SNA-PPP-Unfr-data-In-Oct

This attribute contains the total number of PPP octets without framing sent for the user's session.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	200
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## SNA-PPP-Unfr-data-Out-Oct

This attribute contains the total number of PPP octets without framing received for the user's session.

<b>Type</b>	26
<b>Vendor ID</b>	8164
<b>VSA Type</b>	201
<b>Length</b>	4
<b>Value</b>	Unsigned integer

## ■ Attributes

---

## SNA-RPRAK-Rcvd-Acc-Ack

This attribute contains the total number of A11 registration ACK accepted for the user's session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1028

**Length**

4

**Value**

Unsigned integer

---

## SNA-RPRAK-Rcvd-Mis-ID

This attribute contains the total number of A11 registration ACK messages received with ID-mismatch for the user's session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1030

**Length**

4

**Value**

Unsigned integer

---

## SNA-RPRAK-Rcvd-Msg-Auth-Fail

This attribute contains the total number of message auth failures for A11 registration ACK messages for the user's session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1029

**Length**

4

**Value**

Unsigned integer

---

## SNA-RPRAK-Rcvd-Total

This attribute contains the total number of A11 registration ACK received for the user's session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1027

**Length**

4

**Value**

Unsigned integer

---

## SNA-RP-Reg-Reply-Sent-Acc-Dereg

This attribute contains the number of Accept A11 registration reply sent for the user's session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1033

**Length**

4

**Value**

Unsigned integer

---

## SNA-RP-Reg-Reply-Sent-Acc-Reg

This attribute contains the number of Accept A11 registration reply sent for the user's session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1032

**Length**

4

**Value**

Unsigned integer

## ■ Attributes

---

## SNA-RP-Reg-Reply-Sent-Bad-Req

This attribute contains the number of A11 registration reply sent for bad requests for the user's session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1034

**Length**

4

**Value**

Unsigned integer

---

## SNA-RP-Reg-Reply-Sent-Denied

This attribute contains the number of denied A11 registration reply sent for the user's session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1035

**Length**

4

**Value**

Unsigned integer

---

## SNA-RP-Reg-Reply-Sent-Mis-ID

This attribute contains the number of A11 registration reply sent for mismatched ID for the user's session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1036

**Length**

4

**Value**

Unsigned integer

---

## SNA-RP-Reg-Reply-Sent-Send-Err

This attribute contains the number of A11 registration reply sent with send errors for the user's session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1037

**Length**

4

**Value**

Unsigned integer

---

## SNA-RP-Reg-Reply-Sent-Total

This attribute contains the total number A11 registration reply sent for the user's session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1031

**Length**

4

**Value**

Unsigned integer

---

## SNA-RP-Reg-Upd-Re-Sent

This attribute contains the total number of A11 registration update re-sent for the user's session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1039

**Length**

4

**Value**

Unsigned integer

## ■ Attributes

---

## SNA-RP-Reg-Upd-Send-Err

This attribute contains the total number of A11 registration update send errors for the user's session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1040

**Length**

4

**Value**

Unsigned integer

---

## SNA-RP-Reg-Upd-Sent

This attribute contains the total number of A11 registration update sent for the user's session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1038

**Length**

4

**Value**

Unsigned integer

---

## SNA-RPRRQ-Rcvd-Acc-Dereg

This attribute contains the number of A11 De-registration Requests accepted for the user's session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1021

**Length**

4

**Value**

Unsigned integer

---

## SNA-RPRRQ-Rcvd-Acc-Reg

This attribute contains the number of A11 Registration Requests accepted for the user's session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1020

**Length**

4

**Value**

Unsigned integer

---

## SNA-RPRRQ-Rcvd-Badly-Formed

This attribute contains the number of badly formed A11 registration requests received for the user's session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1024

**Length**

4

**Value**

Unsigned integer

---

## SNA-RPRRQ-Rcvd-Mis-ID

This attribute contains the number of A11 registration requests received with ID-mismatch for the user's session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1023

**Length**

4

**Value**

Unsigned integer

## ■ Attributes

---

## SNA-RPRRQ-Rcvd-Msg-Auth-Fail

This attribute contains the number of message authentication failures for A11 registration requests for the user's session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1022

**Length**

4

**Value**

Unsigned integer

---

## SNA-RPRRQ-Rcvd-T-Bit-Not-Set

This attribute contains the number of A11 registration requests received with T-Bit not set for the user's session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1026

**Length**

4

**Value**

Unsigned integer

---

## SNA-RPRRQ-Rcvd-Total

This attribute contains the number of A11 Registration Requests received for the user's session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1019

**Length**

4

**Value**

Unsigned integer

---

## SNA-RPRRQ-Rcvd-VID-Unsupported

This attribute contains the number of A11 registration requests received with an unsupported Vendor ID for the user's session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

1025

**Length**

4

**Value**

Unsigned integer

---

## SNA1-PPP-Unfr-data-In-Gig

This attribute contains the total number of PPP gigawords without framing sent for the subscriber's session. When combined with the attribute SNA-PPP-Unfr-data-In-Oct, a 64-bit value can be formed which is the total number of PPP octets without framing send for the subscriber's session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

202

**Length**

4

**Value**

Unsigned integer

---

## SNA1-PPP-Unfr-data-Out-Gig

This attribute contains the total number of PPP octets without framing received for the user's session. When combined with the attribute SNA-PPP-Unfr-data-In-Oct, a 64-bit value can be formed which is the total number of PPP octets without framing received for the subscriber's session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

203

**Length**

## ■ Attributes

4

**Value**

Unsigned integer

## SNA1-PPP-Unfr-data-In-Oct

This attribute contains the total number of PPP octets without framing sent for the user's session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

200

**Length**

4

**Value**

Unsigned integer

## SNA1-PPP-Unfr-data-Out-Oct

This attribute contains the total number of PPP octets without framing received for the user's session.

**Type**

26

**Vendor ID**

8164

**VSA Type**

201

**Length**

4

**Value**

Unsigned integer

## Terminal-Capability

Opaque one byte value received from customer RADIUS server in access request. We need to retain this value and return it back in all future accounting messages. Used in custom dictionary.

**Type**

136

**Vendor ID**

5535 (Reusing the 3GPP2 VID in a non-standard way.)

**VSA Type**

219

**Length**

1

**Value**

The system does not interpret this value, but it is copied in accounting messages.

## Termination-Action

Indicates what action the NAS should take when the service is completed. AAMgr passes this attribute to Sessmgr only for ASN-GW calls. The combination of **Session-Timeout** and **Termination-Action** attributes received in Access-Accept or Access-Challenge determines how NAS should interpret it.

**Type**

29

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

6

**Value**

Enumerated integer. Supported values are:

- Default = 0 — Indicates that the session should terminate.
- RADIUS-Request = 1 — Indicates that re-authentication should occur on expiration of the Session-Time. Upon termination of the specified service the NAS may send a new Access-Request to the RADIUS server, including the State attribute if any.

## Tunnel-Assignment-ID

This attribute indicates the tunnel to which the session is to be assigned.

**Type**

82

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

1–247

**Value**

ASCII string. It can be tagged.

## ■ Attributes

---

## Tunnel-Client-Auth-ID

This attribute contains the name of the client for the purposes of tunnel authentication.

**Type**

90

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

1–247

**Value**

ASCII string. It can be tagged.

---

## Tunnel-Client-Endpoint

This attribute is an identifier of the Tunnel client. When Tunnel-Medium-Type = IPv4, then this attribute is in the form of an IP address string in “dotted-decimal” notation.

**Type**

66

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

1–250

**Value**

Opaque value. It can be tagged.

---

## Tunnel-Medium-Type

This attribute indicates the protocol medium over which the tunneling protocol runs. It is used to describe the format of the attributes **Tunnel-Client-Endpoint** and **Tunnel-Server-Endpoint**.

**Type**

65

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

4

**Value**

Enumerated integer. It can be tagged. Supported values are:

- IPv4 = 1
- IPv6 = 2
- NSAP = 3
- HDLC = 4
- BBN-1822 = 5
- IEEE-802 = 6
- E-163 = 7
- E-164 = 8
- F-69 = 9
- X-121 = 10
- IPX = 11
- Appletalk = 12
- Decnet-IV = 13
- Banyan-Vines = 14
- E-164-NSAP-Subaddress = 15

## Tunnel-Password

This attribute contains a shared secret for the Tunnel connection. It is salt-encrypted.

**Type**

69

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

1-240

**Value**

Opaque value

## Tunnel-Preference

This attribute indicates the priority given to the tunnel group. The tunnel group is defined as those tunnel attributes that have the same tag.

**Type**

82

**Vendor ID**

N/A

**■ Attributes****VSA Type**  
N/A**Length**  
4**Value**  
Unsigned integer

## Tunnel-Private-Group-ID

This attribute contains the context of the tunnel.

**Type**  
81**Vendor ID**  
N/A**VSA Type**  
N/A**Length**  
1–252**Value**  
ASCII string. It can be tagged.

## Tunnel-Server-Auth-ID

This attribute contains the name of the server for the purposes of tunnel authentication.

**Type**  
91**Vendor ID**  
N/A**VSA Type**  
N/A**Length**  
1–252**Value**  
Opaque value

## Tunnel-Server-Endpoint

This attribute is an identifier of the Tunnel server. When Tunnel-Medium-Type = IPv4, then this attribute is in the form of an IP address string in “dotted-decimal” notation.

**Type**  
67

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

1–250

**Value**

A string identifying the Tunnel server. It can be tagged.



**Important:** This attribute is used in conjunction with L2TP functionality. Please refer to the [RFC 2868 Tunneling Attributes](#) section for additional information on this and other attributes added in support of this functionality.

## Tunnel-Type

This attribute indicates the type of tunnel used by the subscriber.

**Type**

64

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

4

**Value**

Enumerated integer. It can be tagged. Supported values are:

- PPTP = 1
- L2F = 2
- L2TP = 3
- ATMP = 4
- VTP = 5
- AH = 6
- IP-IP = 7
- MIN-IP-IP = 8
- ESP = 9
- GRE = 10
- DVS = 11
- MIP = 12
- VLAN = 13

## User-Name

This attribute indicates the name of the user to be authenticated. This field can contain a stand-alone user name, or a user name and domain name. The format of this field is variable and configurable on a per-context basis. Separation of user and domain names is delineated by a special character, which can be %, -, @, \, #, and /. The user name may appear before the domain name or after. If this attribute is included in the Access-Accept, then the value of that attribute will be the value of the **User-Name** attribute in subsequent Accounting-Request messages for that particular session.

This attribute is also accepted in CoA request and response messages to be used in a currently active subscriber session.

**Type**

1

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

1–253

**Value**

String

## User-Password

This attribute contains the encrypted password of the user, when simple password authentication is being used.

**Type**

2

**Vendor ID**

N/A

**VSA Type**

N/A

**Length**

1–128

**Value**

String

## White-List

This attribute contains the list of IMSIs which are allowed to access through an HNB.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

9

**VSA Type**

117

**Length**

3-251

**Value**

Opaque value

---

## WiMAX-Acct-Input-Packets-Giga

Number of packets incremented each time Acct-Input-Packets(47) overflows.

**Type**

26

**Vendor ID**

24757

**VSA Type**

48

**Length**

4

**Value**

Unsigned integer

---

## WiMAX-Acct-Output-Packets-Giga

Number of packets incremented each time Acct-Output-Packets(48) overflows.

**Type**

26

**Vendor ID**

24757

**VSA Type**

49

**Length**

4

**Value**

Unsigned integer

---

## WiMAX-Active-Time

The period of time the session was NOT in idle state.

**Type**

26

**Vendor ID**

## ■ Attributes

24757

**VSA Type**

39

**Length**

4

**Value**

Unsigned integer

## WiMAX-Beginning-Of-Session

This attribute indicates whether the session is new or a continuation of previous flow.

**Type**

26

**Vendor ID**

24757

**VSA Type**

22

**Length**

4

**Value**

Enumerated integer. Supported values are:

- False = 0
- True = 1

## WiMAX-BS-ID

Uniquely identifies an NAP and a Base Station within that NAP. The first three octets representing the NAP operator identifier, and the next three the Base Station ID.

**Type**

26

**Vendor ID**

24757

**VSA Type**

46

**Length**

6–12

**Value**

Opaque value

---

## WiMAX-Capability

This compound attribute identifies the supported WiMAX capabilities.

**Type**

26

**Vendor ID**

24757

**VSA Type**

1

**Length**

1–246

**Value**

Contains the following subattributes:

---

### WiMAX-Release

Specifies WiMAX release of the sender.

**Type**

1

**Length**

4

**Value**

ASCII string

---

### Accounting-Capabilities

Describes accounting capabilities supported for the session.

**Type**

2

**Length**

1

**Value**

0x00 = No accounting. Only valid at the HA.

- 0x01 = IP-Session-based accounting. Default value for the ASN.
- 0x02 = Flow-based accounting

---

### Hotlining-Capabilities

Supported hotline capabilities.

**Type**

3

**Length**

1

**Value**

- Not-Supported = 0x00 — Hotlining is not supported
- Hotline-Profile-Id = 0x01 — Profile-based Hot lining is supported (using Hotline-Profile-ID VSA)
- NAS-Filter = 0x02 — Rule-based Hot lining is supported using NAS-Filter-Rule
- HTTP-Redirection = 0x04 — Hot lining HTTP Redirection is supported.
- Profile-Id-based-and-HTTP-Redirection-Rule-based = 0x05
- IP-Redirection = 0x08 — Rule-based Hot lining is supported using IP-Redirection rule.

**Idle-Mode-Notification-Capabilities**

Describes idle mode notification capabilities.

**Type**

4

**Length**

1

**Value**

0x00 = Idle Mode notification is not supported or is not required.

- 0x01 = Idle Mode notification is supported or is required.

**ROHC-Support**

Describes ROHC capability support for the session

**Type**

11

**Length**

1

**Value**

Enumerated integer. Supported values are:

- Not-Supported = 0x00
- Supported = 0x01

**WiMAX-Control-Octets-In**

Octet counts for incoming Mobile IP, DHCP, ICMP messages for IPv4 and IPv6.

**Type**

26

**Vendor ID**

24757

**VSA Type**

4

**Length**

13

**Value**

Unsigned integer

---

## WiMAX-Control-Octets-Out

Octet counts for outgoing Mobile IP, DHCP, ICMP messages for IPv4 and IPv6.

**Type**

26

**Vendor ID**

24757

**VSA Type**

34

**Length**

4

**Value**

Unsigned integer

---

## WiMAX-Control-Packets-In

Packet counts for incoming Mobile IP, DHCP, ICMP messages for IPv4 and IPv6.

**Type**

26

**Vendor ID**

24757

**VSA Type**

4

**Length**

13

**Value**

Unsigned integer

---

## WiMAX-Control-Packets-Out

Packet counts for outgoing Mobile IP, DHCP, ICMP messages for IPv4 and IPv6.

**Type**

26

**Vendor ID**

24757

**VSA Type**

33

**■ Attributes****Length**

4

**Value**

Unsigned Integer

## WiMAX-Count-Type

Indicates if the record represents compressed counts over-the-air.

**Type**

26

**Vendor ID**

24757

**VSA Type**

59

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Uncompressed = 0
- Compressed = 1

## WiMAX-Device-Auth-Indicator

Indicates whether NAS performed device authentication successfully or not.

**Type**

26

**Vendor ID**

24757

**VSA Type**

2

**Length**

1

**Value**

Unsigned octet.

## WiMAX-Flow-Description

Describes a flow classifier.

**Type**

26

**Vendor ID**

24757

**VSA Type**

50

**Length**

1–240

**Value**

String

## WiMAX GMT-Time-Zone-Offset

The current offset in seconds of the local time at the NAS with respect to GMT time.

**Type**

26

**Vendor ID**

24757

**VSA Type**

3

**Length**

4

**Value**

Unsigned integer

## WiMAX-Home-HNP-PMIP6

The IPv6 Home Network Prefix assigned by the AAA in HCSN to the MS for PMIP6 mobility session.

**Type**

26

**Vendor ID**

24757

**VSA Type**

133

**Length**

2–18

**Value**

Opaque value

## WiMAX-Home-IPv4-HoA-PMIP6

The IPv4 Home Address assigned by the CSN to the MS for PMIP6-IPv4 mobility session.

**Type**

26

## ■ Attributes

<b>Vendor ID</b>	24757
<b>VSA Type</b>	135
<b>Length</b>	4
<b>Value</b>	IPv4 Address

---

## WiMAX-Idle-Mode-Transition

A flag indicating whether the mobile node is in idle mode or not. When the mobile node enters or exits idle mode, an interim accounting message that includes WiMAX-Idle-Mode-Transition(26/44) attribute is generated instantly. The value of this attribute is 1 when mobile enters idle mode, and 0 when mobile exits idle mode. If accounting mode is flow based, then the asynchronous interim message is generated only for an ISF and not for all the flows in the session. Regular interim accounting if enabled, is not affected by idle mode entry. Also, the regular interim messages will not include WiMAX-Idle-Mode-Transition attribute.

<b>Type</b>	26
<b>Vendor ID</b>	24757
<b>VSA Type</b>	44
<b>Length</b>	1
<b>Value</b>	Enumerated integer. Supported values are: <ul style="list-style-type: none"> <li>• In idle mode = 0x01</li> <li>• Not in idle mode = 0x00</li> </ul>

---

## WiMAX-IP-Technology

Indicates the type of WiMAX session being used.

<b>Type</b>	26
<b>Vendor ID</b>	24757
<b>VSA Type</b>	23
<b>Length</b>	4
<b>Value</b>	

Enumerated integer. Supported values are:

- SIP = 1
- PMIP4 = 2
- CMIP4 = 3
- CMIP6 = 4
- Ethernet-CS = 5
- PMIP6 = 6

---

## WiMAX-NAP-ID

Uniquely identifies the Network Access Provider.

**Type**

26

**Vendor ID**

24757

**VSA Type**

45

**Length**

3

**Value**

String

---

## WiMAX-NSP-ID

Uniquely identifies the Network Service Provider.

**Type**

26

**Vendor ID**

24757

**VSA Type**

57

**Length**

3

**Value**

Opaque value

---

## WiMAX-Packet-Flow-Descriptor

This compound attribute describes a packet flow. A packet flow may describe uni-directional flow and bi-directional flow. The packet flow descriptor may be pre-provisioned. A packet flow descriptor references one or two QoS specifications.

**■ Attributes**

<b>Type</b>	26
<b>Vendor ID</b>	24757
<b>VSA Type</b>	28
<b>Length</b>	4–1400
<b>Value</b>	Contains the following subattributes:

---

**PDF-ID**

Used to match all records from the same Packet Data Flow.

<b>Type</b>	1
<b>Length</b>	2
<b>Value</b>	Unsigned integer

---

**SDF-ID**

Used to match all PDFs from the same Service Data Flow.

<b>Type</b>	2
<b>Length</b>	2
<b>Value</b>	Unsigned integer

---

**Service-Profile-ID**

Identifies a pre configured Flow Descriptor at the NAS.

<b>Type</b>	3
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

**Direction**

Direction of the PDF.

<b>Type</b>	4
<b>Length</b>	1
<b>Value</b>	<p>Enumerated integer. Supported values are:</p> <ul style="list-style-type: none"> <li>• Uplink = 1</li> <li>• Downlink = 2</li> <li>• Bi-Directional = 3</li> </ul>

---

## Activation-Trigger

Specifies the trigger to be used for the activation of Service Flow.

<b>Type</b>	5
<b>Length</b>	1
<b>Value</b>	<p>Enumerated integer. Supported values are:</p> <ul style="list-style-type: none"> <li>• Provisioned = 0x01</li> <li>• Admit = 0x02</li> <li>• Provisioned-Admit = 0x03</li> <li>• Activate = 0x04</li> <li>• Provisioned-Activate = 0x05</li> <li>• Admit-Activate = 0x06</li> <li>• Provisioned-Admit-Activate = 0x07</li> <li>• Dynamic = 0x08</li> <li>• Dynamic-Admit = 0x0a</li> <li>• Dynamic-Activate = 0x0c</li> <li>• Dynamic-Admit-Activate = 0x0e</li> </ul>

---

## Transport-Type

Type of transport (IP, Ethernet).

<b>Type</b>	6
<b>Length</b>	1
<b>Value</b>	Enumerated integer

---

## Uplink-QoS-ID

Identifier of the QoS Descriptor for Uplink or Bidirection.

**Type**

7

**Length**

1

**Value**

Unsigned integer

---

## Downlink-QoS-ID

Identifier of the QoS Descriptor for Downlink.

**Type**

8

**Length**

1

**Value**

Unsigned integer

---

## Uplink-Classifier

Classifier to match for traffic flowing in Uplink Direction.

**Type**

9

**Length**

1–240

**Value**

String

---

## Downlink-Classifier

Classifier to match for traffic flowing in Downlink Direction.

**Type**

10

**Length**

1–240

**Value**

String

---

## WiMAX-Packet-Flow-Descriptor-V2

Describes a Unidirectional or Bidirectional Packet Flow Descriptor Version 2.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

26

**Vendor ID**

24757

**VSA Type**

84

**Length**

4–1400

**Value**

Contains the following subattributes:

**PDF-ID**

Used to match all records from the same Packet Data Flow.

**Type**

1

**Length**

2

**Value**

Unsigned integer

**SDF-ID**

Used to match all PDFs from the same Service Data Flow.

**Type**

2

**Length**

2

**Value**

Unsigned integer

**Service-Profile-ID**

Identifies a pre-configured Flow Descriptor at the NAS.

**Type**

3

**Length**

4

**Value**

Unsigned integer

---

## Direction

Direction of the PDF.

**Type**

4

**Length**

1

**Value**

Enumerated integer. Supported values are:

- Uplink = 1
- Downlink = 2
- Bi-Directional = 3

---

## Activation-Trigger

Specifies the trigger to be used for the activation of Service Flow.

**Type**

5

**Length**

1

**Value**

Enumerated integer. Supported values are:

- Provisioned = 0x01
- Admit = 0x02
- Activate = 0x04
- Dynamic = 0x08

---

## Transport-Type

Type of transport (IP, Ethernet).

**Type**

6

**Length**

1

**Value**

Enumerated integer. Supported values are:

- IPv4-CS = 1
- IPv6-CS = 2
- Ethernet = 3

---

## Uplink-QoS-ID

Identifier of the QoS Descriptor for Uplink or Bidirection.

**Type**

7

**Length**

1

**Value**

Unsigned integer

---

## Downlink-QoS-ID

Identifier of the QoS Descriptor for Downlink.

**Type**

8

**Length**

1

**Value**

Unsigned integer

---

## WiMAX-Packet-Flow-Classifier

Describes Packet Flow Classifiers.

**Type**

9

**Value**

Contains the following subattributes:

---

### Classifier-ID

WiMAX Classifier ID.

**Type**

1

**Length**

1

**Value**

Unsigned integer

---

### Priority

WiMAX Classifier Priority.

**Type**

2

**Length**

1

**Value**

Unsigned integer

**Protocol**

WiMAX Classifier Protocol, i.e TCP/UDP.

**Type**

3

**Length**

1

**Value**

In StarOS 10.0 and earlier, enumerated integer. Supported values are:

- ICMP = 1
- TCP = 6
- UDP = 17

In StarOS 10.2 and later, Unsigned integer

**Direction**

Direction of the PDF.

**Type**

4

**Length**

1

**Value**

Enumerated integer. Supported values are:

- Uplink = 1
- Downlink = 2
- Bi-Directional = 3

**Source-Specification**

Identifies WiMAX classifier rule params for source specification.

**Type**

5

**Value**

Contains the following subattributes:

**IP-Address**

This attribute contains source/destination address.

**Type**

1

**Length**

4

**Value**

IPv4 address.

---

**IP-Address-Range**

WiMAX Packet Classifier IP Address Range.

**Type**

2

**Length**

1

**Value**

Opaque value

---

**IP-Address-Mask**

WiMAX Packet Classifier IP Address Mask.

**Type**

3

**Length**

5

**Value**

Opaque value

---

**Port**

WiMAX Packet Classifier Port.

**Type**

4

**Length**

2

**Value**

Unsigned integer

---

**Port-Range**

WiMAX Packet Classifier Port Range.

**Type**

5

**Length**

4

**Value**

Unsigned integer

---

**Inverted**

## ■ Attributes

WiMAX Classifier Inverted.

**Type**

6

**Length**

1

**Value**

Enumerated integer. Supported values are:

- FALSE = 0
- TRUE = 1

**Assigned**

WiMAX Classifier Assigned.

**Type**

7

**Length**

1

**Value**

Enumerated integer. Supported values are:

- Src\_Assigned = 1
- Dest\_Assigned = 2
- Src\_Dest\_Assigned = 3

**Destination-Specification**

Identifies WiMAX classifier rule params for destination specification.

**Type**

6

**Value**

Contains the following subattributes:

**IP-Address**

This attribute contains source/destination address.

**Type**

1

**Length**

4

**Value**

IPv4 address.

**IP-Address-Range**

WiMAX Packet Classifier IP Address Range.

---

<b>Type</b>	2
<b>Length</b>	8
<b>Value</b>	Opaque value

---

### IP-Address-Mask

WiMAX Packet Classifier IP Address Mask.

<b>Type</b>	3
<b>Length</b>	5
<b>Value</b>	Opaque value

---

### Port

WiMAX Packet Classifier Port.

<b>Type</b>	4
<b>Length</b>	2
<b>Value</b>	Unsigned integer

---

### Port-Range

WiMAX Packet Classifier Port Range.

<b>Type</b>	5
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

### Inverted

WiMAX Classifier Inverted.

<b>Type</b>	6
<b>Length</b>	1
<b>Value</b>	

Enumerated integer. Supported values are:

- FALSE = 0
- TRUE = 1

---

### Assigned

WiMAX Classifier Assigned.

**Type**

7

**Length**

1

**Value**

Enumerated integer. Supported values are:

- Src\_Assigned = 1
- Dest\_Assigned = 2
- Src\_Dest\_Assigned = 3

---

### IP-TOS-DSCP-Range-And-Mask

WiMAX Classifier WiMAX-IP-TOS-DSCP-Range-And-Mask.

**Type**

7

**Length**

1–3

**Value**

Opaque value

---

### Action

WiMAX Classifier Action.

**Type**

8

**Length**

1

**Value**

Enumerated integer. Supported values are:

- Reserved = 0
- Permit = 1
- Deny = 2

---

### Paging-Preference

WiMAX Paging Preference.

**Type**

10

**Length**

1

**Value**

Enumerated integer. Supported values are:

- FALSE = 0
- TRUE = 1

---

## WiMAX-PDF-ID

The value of this attribute matches all records from the same packet data flow. PDFID is assigned by the CSN and remains constant through all handover scenarios.

**Type**

26

**Vendor ID**

24757

**VSA Type**

26

**Length**

2

**Value**

Unsigned integer

---

## WiMAX-PPAC

The Prepaid-Accounting-Capability (PPAC) attribute is sent in the Access-Request message by a prepaid capable ASNGW, and is used to describe the prepaid capabilities of the ASNGW. The absence of this attribute indicates that the client is not capable of prepaid accounting and the session should not use prepaid accounting.

**Type**

26

**Vendor ID**

24757

**VSA Type**

35

**Value**

Contains the following subattribute:

---

### Available-In-Client

The optional Available-In-Client subtype, generated by the PPC, indicates the metering capabilities of the NAS and is be bitmap encoded.

**Type**

## ■ Attributes

<b>Length</b>	1
<b>Value</b>	4
<b>Value</b>	Enumerated integer. Supported values are: <ul style="list-style-type: none"> <li>• Supported_None = 0</li> <li>• Supported_Volume = 1</li> <li>• Supported_Duration = 2</li> <li>• Supported_Volume_And_Duration = 3</li> </ul>

---

## WiMAX-PPAQ

Prepaid Quota, used for charging, report usage, and request quota. This attribute specifies the characteristics for pre-paid accounting of the volume and/or duration of a packet data session. It should be present in all on-line RADIUS Access-Request and on-line RADIUS Access-Accept messages and may be included in other RADIUS Access-Accept messages. In Authorize-Only Access-Request messages, it is used for one-time charging, report usage and the request for further quota. In an Access-Accept message it is used in order to allocate the (initial and subsequent) quotas.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

<b>Type</b>	26
<b>Vendor ID</b>	24757
<b>VSA Type</b>	37

<b>Value</b>	Contains the following subattributes:
--------------	---------------------------------------

---

### Quota-Identifier

Is generated by the PPS together with the allocation of new quota.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

<b>Type</b>	1
<b>Length</b>	1-4
<b>Value</b>	Opaque value

---

### Volume-Quota

Indicates the volume in octets excluding control data.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

2

**Length**

4-12

**Value**

Opaque value

## Volume-Threshold

Is generated by the PPS and indicates the volume (in octets) that be consumed before a new quota should be requested.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

3

**Length**

4-12

**Value**

Opaque value

## Duration-Quota

3GPP2 PrePaid Duration Quota. This is optionally present if duration-based charging is used. In RADIUS Access-Accept message, it indicates the duration (in seconds) allocated for the session by the PPS. In an on-line RADIUS Access-Accept message, it indicates the total duration (in seconds) since the start of the accounting session related to the QuotaID of the PPAQ in which it occurs.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

**Type**

4

**Length**

4

**Value**

Unsigned integer

## Duration-Threshold

3GPP2 PrePaid Duration Quota Threshold. This is optionally present if Duration-Quota is present in a RADIUS Access-Accept message. It is generated by the PPS and indicates the duration (in seconds) that should be consumed before a new quota should be requested. This threshold should not be larger than the Duration-Quota.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

<b>Type</b>	5
<b>Length</b>	4
<b>Value</b>	Unsigned integer

---

## Update-Reason

Reason for initiating online quota update operation. This should be present in the Authorize-Only RADIUS Access-Request message. It indicates the reason for initiating the on-line quota update operation. Update reasons 6, 7, 8, and 9 indicate that the associated resources are released at the client side, and that therefore the PPS should not allocate a new quota in the RADIUS Access Accept message.

<b>Type</b>	8
<b>Length</b>	1
<b>Value</b>	Enumerated integer. Supported values are: <ul style="list-style-type: none"> <li>• Pre-Initialization = 1</li> <li>• Initial-Request = 2</li> <li>• Threshold-Reached = 3</li> <li>• Quota-Reached = 4</li> <li>• TITSU-Approaching = 5</li> <li>• Remote-Forced-Disconnect = 6</li> <li>• Client-Service-Termination = 7</li> <li>• Access-Service-Terminated = 8</li> <li>• Service-Not-Established = 9</li> <li>• One-Time-Charging = 10</li> </ul>

---

## Pre-Paid-Server

PrePaid server IP address. This optional subtype indicates the address IPv4 of the serving PPS. If present, the Home RADIUS server uses this address to route the message to the serving PPS. The attribute may be sent by the Home RADIUS server. Multiple instances of this subtype may be present in a single PPAQ. If present in the incoming RADIUS Access-Accept message, the ASNGW should send this attribute back without modifying it in the subsequent RADIUS Access-Request message.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

<b>Type</b>	9
<b>Length</b>	4

Value	IPv4 address
-------	--------------

---

## Service-ID

This value is a string that uniquely describes the service instance to which prepaid metering should be applied.

Type	10
Length	1-246
Value	Opaque value

---

## Rating-Group-ID

Rating-Group-ID for which the WiMAX PPAQ is allocated or reported.

Type	11
Length	4
Value	Unsigned integer

---

## Termination-Action

Describes action to take when PPS does not grant additional quota.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

Type	12
Length	4
Value	Enumerated integer. Supported values are:

- Reserved = 0
- Terminate = 1
- Request-more-quota = 2
- Redirect/Filter = 3

---

## WiMAX-Prepaid-Indicator

Indicates that this session was associated with a prepaid user (online accounting).

## ■ Attributes

<b>Type</b>	26
<b>Vendor ID</b>	24757
<b>VSA Type</b>	25
<b>Length</b>	1
<b>Value</b>	<p>Enumerated integer. Supported values are:</p> <ul style="list-style-type: none"> <li>• Offline = 0</li> <li>• Online = 1</li> </ul>

---

## WiMAX-Prepaid-Tariff-Switch

Attribute to indicate Tariff-Switch-Interval / Time-Interval-After-Tariff-Switch-Update by the PPS and Volume-Used-After-Tariff-Switch by the PPC.

<b>Type</b>	26
<b>Vendor ID</b>	24757
<b>VSA Type</b>	38
<b>Value</b>	Contains the following subattributes:

---

### Quota-Identifier

It is generated by the PPS together with the allocation of new quota.

<b>Type</b>	1
<b>Length</b>	1-4
<b>Value</b>	Opaque value

---

### Volume-Used-After-Tariff-Switch

Volume Quota used after Tariff Switch Happened

<b>Type</b>	2
<b>Length</b>	4

<b>Value</b>	Unsigned integer
--------------	------------------

---

### Tariff-Switch-Interval

Tariff Switch Interval in seconds

<b>Type</b>	3
-------------	---

<b>Length</b>	4
---------------	---

<b>Value</b>	Unsigned integer
--------------	------------------

---

### Time-Interval-After-Tariff-Switch-Update

Duration after TSI where an on-line RADIUS Access-Request is sent by PrePaid client to report VUATS before the next TS condition is triggered

<b>Type</b>	4
-------------	---

<b>Length</b>	4
---------------	---

<b>Value</b>	Unsigned integer
--------------	------------------

---

## WiMAX-QoS-Descriptor

This attribute describes over the air QoS parameter that are associated with a flow. The QoS-Descriptor is only valid for the actual RADIUS transaction.

This attribute is also accepted in CoA request message to be used in a currently active subscriber session.

<b>Type</b>	26
-------------	----

<b>Vendor ID</b>	24757
------------------	-------

<b>VSA Type</b>	29
-----------------	----

<b>Length</b>	6–700
---------------	-------

<b>Value</b>	Contains the following 17 subattributes:
--------------	--

---

### QoS-ID

Unique ID for the QoS specification in the packet

<b>Type</b>	1
<b>Length</b>	1
<b>Value</b>	Unsigned integer

---

## Global-Service-Class-Name

Represents Global Service Class Name as defined in IEEE802.16e

<b>Type</b>	2
<b>Length</b>	6
<b>Value</b>	String

---

## Service-Class-Name

Represents Service Class Name as defined in IEEE802.16e

<b>Type</b>	3
<b>Length</b>	2–127
<b>Value</b>	String

---

## Schedule-Type

Specifies Uplink granted scheduling type.

<b>Type</b>	4
<b>Length</b>	1
<b>Value</b>	Enumerated integer. Supported values are: <ul style="list-style-type: none"> <li>• Best-Effort = 2</li> <li>• nrtPS = 3</li> <li>• rtPS = 4</li> <li>• Extended-rtPS = 5</li> <li>• UGS = 6</li> </ul>

---

## Traffic-Priority

Specifies the priority assigned to a Service Flow.

**Type**

5

**Length**

1

**Value**

Unsigned integer

---

## Maximum-Sustained-Traffic-Rate

Defines Peak Information Rate of the service in bits/second.

**Type**

6

**Length**

4

**Value**

Unsigned integer

---

## Minimum-Reserved-Traffic-Rate

Defines Minimum Rate reserved for the Service Flow in bits/second.

**Type**

7

**Length**

4

**Value**

Unsigned integer

---

## Maximum-Traffic-Burst

Defines Maximum Burst Size accommodated for the Service in bytes/second

**Type**

8

**Length**

4

**Value**

Unsigned integer

---

## Tolerated-Jitter

Represents Maximum Delay Variation in milliseconds.

**Type**

9

**Length**

4

**Value**

Unsigned integer

## Maximum-Latency

Represents Maximum Latency in milliseconds.

**Type**

10

**Length**

4

**Value**

Unsigned integer

## Reduced-Resources-Code

Indicates that requesting entity will accept reduced resources if requested resources are unavailable.

**Type**

11

**Length**

1

**Value**

Unsigned integer

## Media-Flow-Type

Describes the application type, used as a hint in admission decisions.

**Type**

12

**Length**

1

**Value**

Enumerated integer. Supported values are:

- VoIP = 1
- Robust-Browser = 2
- Secure-Browser/VPN = 3
- Streaming-Video-On-Demand = 4
- Streaming-Live-TV = 5
- Music-Photo-Download = 6
- Multi-Player-Gaming = 7

- Location-Based-Services = 8
- Text-Audio-Books-With-Graphics = 9
- Video-Conversation = 10
- Message = 11
- Control = 12
- Data = 13

---

## Unsolicited-Grant-Interval

Specifies nominal interval between successive data grant opportunities for the Service Flow, in milliseconds.

**Type**

13

**Length**

2

**Value**

Unsigned integer

---

## SDU-Size

Represents the number of bytes in the fixed size SDU.

**Type**

14

**Length**

1

**Value**

Unsigned integer

---

## Unsolicited-Polling-Interval

Specifies maximal nominal interval between successive polling grant opportunities for the Service Flow.

**Type**

15

**Length**

2

**Value**

Unsigned integer

---

## Transmission-Policy

Include options for PDU formation, and for uplink service flows, restrictions on the types of bandwidth request options that may be used.

**Type**

17

**Length**

In StarOS 9.0 and earlier releases: 4

In StarOS 10.0 and later releases: 1

**Value**

In StarOS 10.0 and earlier releases: enumerated integer. Supported values are:

- no-bcast = 0x01
- no-mcast = 0x02
- no-piggy-back = 0x04
- no-fragment = 0x08
- no-sup-payload-header = 0x10
- no-multiple-sdu = 0x20
- no-crc = 0x40
- no-rohc-compression = 0x80

In StarOS 10.2 and later releases: Unsigned integer

**DSCP**

DSCP

**Type**

18

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Best-Effort=0
- AF11=10
- AF12=12
- AF13=14
- AF21=18
- AF22=20
- AF23=22
- AF31=26
- AF32=28
- AF33=30
- AF41=34
- AF42=36
- AF43=38
- EF=46

---

## WiMAX-RRQ-HA-IP

IPv4 or IPv6 address of the HA as contained in the MIP Registration Request or the BU.

**Type**  
26

**Vendor ID**  
24757

**VSA Type**  
18

**Length**  
4-16

**Value**  
Opaque value

---

## WiMAX-SDF-ID

The value of this attribute matches all records from the same packet data flow. SDFID is assigned by the CSN and remains constant through all handover scenarios.

**Type**  
26

**Vendor ID**  
24757

**VSA Type**  
27

**Length**  
2

**Value**  
Unsigned integer

---

## WiMAX-Session-Continue

The value of this attribute matches all records from the same packet data flow. SDFID is assigned by the CSN and remains constant through all handover scenarios.

**Type**  
26

**Vendor ID**  
24757

**VSA Type**  
21

**Length**  
4

**Value**

**■ Attributes**

Enumerated integer. Supported values are:

- False = 0
- True = 1

---

## WiMAX-Session-Term-Capability

WiMAX session term capability. This attribute is included in a RADIUS Access-Request message to the RADIUS server and indicates whether or not the NAS supports Dynamic Authorization.

**Type**

26

**Vendor ID**

24757

**VSA Type**

36

**Length**

4

**Value**

Enumerated integer. Supported values are:

- Only\_Dynamic\_Auth\_Extn\_to\_Radius = 0x00000001
- Only\_Reg\_Revocation\_in\_MIP = 0x00000002
- Both\_Dynamic\_Auth\_And\_Reg\_Revocation\_in\_MIP = 0x00000003

---

## Win-Call-Id

Customer-specific attribute used in custom dictionary. Contains opaque 1 byte value received from customer RADIUS server in access request.

**Type**

136

**Vendor ID**

5535 (Reusing the 3GPP2 VID in a non-standard way.)

**VSA Type**

205

**Length**

1

**Value**

The system does not interpret this value, but it is copied in accounting messages.

---

## Win-Service-Name

Opaque value value received from customer RADIUS server in access request. We need to retain this value and return it back in all future accounting messages. Used in custom dictionary.

**Type**

136

**Vendor ID**

5535 (Reusing the 3GPP2 VID in a non-standard way.)

**VSA Type**

206

**Length**

1 – 256

**Value**

The system does not interpret this value, but it is copied in accounting messages.

---

## WSType

Opaque one byte value received from customer RADIUS server in access request. We need to retain this value and return it back in all future accounting messages.

**Type**

136

**Vendor ID**

5535 (Reusing the 3GPP2 VID in a non-standard way.)

**VSA Type**

197

**Length**

1

**Value**

The system does not interpret this value, but it is copied in accounting messages.

## Attribute Notes

This section contains notes that apply to groups of attributes that have been included in support of specific features and/or functionality.

## RFC 2868 Tunneling Attributes

Tunnel attributes may be tagged, which means the leading byte in the value field may be used to group attributes together. This is used to return a number of different tunnel configurations that are available to the subscriber. The tagged group with the highest tunnel preference (the lowest value of the Tunnel-Preference attribute) has precedence over other tunnel configurations.

Tags can be a value from 1 through 31. Any value outside of this range for the leading byte means the attribute is not tagged, and the leading byte is then interpreted as part of the attribute value. Integer attributes that are tagged are three bytes in length (the leading byte is ignored), but are four bytes in length when not tagged (the leading byte is incorporated).

If Tunnel attributes appear more than once in the RADIUS Accept-Accept but are not tagged, then the system treats the attributes as having an implicit tag. The first instance of the attribute has a tag value of 32, the second instance has a tag value of 33, etc.

# Chapter 7

## GTPP Accounting Overview

---

This chapter provides an overview of GTPP accounting, GGSN Call Detail Records (G-CDRs), Enhanced GGSN Call Detail Records (eG-CDRs), PDN Gateway CDRs (PGW-CDRs), and Serving Gateway CDRs (SGW-CDRs) in the Cisco ASR 5000 Series Multimedia Core Platform.

# Overview

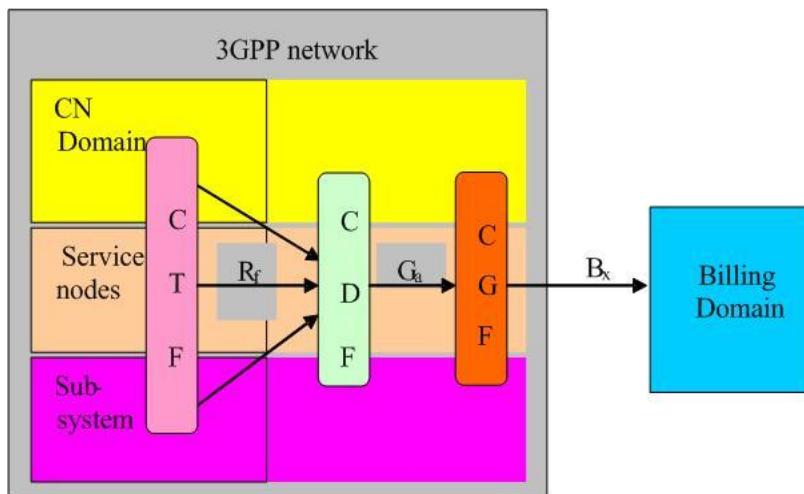
This section provides information on GTPP interface between Charging Gateway Function (CGF) and Cisco Systems' licensed products running on the ASR 5000 core platforms, such as Packet Data Network (PDN) Gateway (P-GW) and Serving Gateway (S-GW) in 3GPP2 evolved High Rate Packet Data (eHRPD) and Long Term Evolution-System Architecture Evolution (LTE-SAE) wireless data networks.

The Ga is the reference point from Charging Data Function (CDF) to the CGF, which is intended for the transport of Charging Data Records (CDRs). The CDF could either be GGSN, P-GW, S-GW, or any other similar products.

By definition, dealing with CDRs only implies that Ga is solely related to offline charging.

The following figure depicts the position of the Ga reference point within the overall 3GPP offline charging architecture.

**Figure 3. 3GPP Offline Charging Architecture**



As illustrated in the above figure, the CDF in each network domain, service or subsystem is relevant for the network side of the Ga reference point. Different mappings of the ubiquitous offline charging functions, CDF and CGF, onto physical implementations are possible.

The transport protocol associated to the Ga reference point, providing functions for transfer of CDRs from CDF to CGF, is GTPP.

Each CDF will have an O&M configurable address list of CGFs (Charging Gateways) to which it can send its CDRs. The list will be organized in CGF address priority order. If the primary CGF is not available (for example, out of service), then the CDF will send the CDRs to the secondary CGF and so on.

Each CDR generating function will only send the records to the CGF(s) of the same PLMN, not to CGF(s) located in other PLMNs.

Each CGF in the PLMN will know the other CGFs' network addresses (for example, for redundancy reasons, to be able to recommend another CGF address). This is achieved by O&M configuration facilities that will enable each CGF to have a configurable list of peer CGF addresses.

## CDR Transport by GTPP

GTPP has been designed to deliver the CDR(s) from the CDF to the CGF(s). This protocol is required if the CGF resides outside the CDFs. It utilizes some aspects of GTPP, which is used for packet data tunneling in the backbone network.

GTPP operates on the Ga interface and does not imply the use of any specific backbone network.

GTPP performs the following functions:

- CDR transfer between the CDF and the CGF
- Redirection of CDRs to another CGF
- Advertise to peers about its CDR transfer capability (for example, after a period of service downtime)
- Prevents duplicate CDRs that might arise during redundancy operations. If so configured, the CDR duplication prevention function may also be carried out by marking potentially duplicated CDR packets, and, delegating the final duplicate deletion task to a CGF or the Billing Domain (instead of handling the possible duplicates solely by GTPP messaging).

# Path Protocol

GTPP uses path protocol to transport CDRs from CDF to CGF over the Ga interface so as to facilitate charging.

The following path protocols are supported for GTPP:

- UDP as the Path Protocol

Ports for signaling the request messages:

- The UDP Destination Port may be the server port number 3386 which has been reserved for GTPP.  
Alternatively, another port can be used as configured by O&M.
- The UDP Source Port is a locally allocated port number at the sending network element.

Ports for signaling the response messages:

- The UDP Destination Port can be the value of the Source Port of the corresponding request message.
- The UDP Source Port can be the value from the Destination Port of the corresponding request message.

- TCP as the Path Protocol

The TCP Destination Port may be the server port number 3386, which has been reserved for G-PDUs.  
Alternatively, another port may be used as configured by O&M. Extra implementation-specific destination ports are possible but all CGFs shall support the server port number.

The TCP Source Port is a random port locally assigned at the sending network element.



**Important:** ASR 5K supports IPV4 only as a transport layer IP.

# GTPP Message Types

GTPP defines a set of messages between two associated nodes. The GTPP messages defined are shown in the following table.

*Table 2. GTPP Messages*

Message Type value (Decimal)	GTPP Message
1	Echo Request
2	Echo Response
3	Version Not Supported
<b>4</b>	<b>Node Alive Request</b>
<b>5</b>	<b>Node Alive Response</b>
<b>6</b>	<b>Redirection Request</b>
<b>7</b>	<b>Redirection Response</b>
<b>240</b>	<b>Data Record Transfer Request</b>
<b>241</b>	<b>Data Record Transfer Response</b>
Others	Reserved for future use

The messages introduced by GTPP are in boldface letters. The other messages are inherited from GTPP protocol.

The GTPP introduced the following signaling message types as Path Management Messages:

- Node Alive Request
- Node Alive Response
- Redirection Request
- Redirection Response

---

 **Important:** Echo messages and node-alive messages are not supported if the transport layer protocol is TCP.

The following signaling messages are grouped under the category “Record Transmission Messages”:

- Data Record Transfer Request
- Data Record Transfer Response

The reserved fields in the signaling messages can be filled with ones, and are intended for future use.

GTPP reuses the GTPP Cause values. The message type numbers required for the newly introduced GTPP messages have been derived from the unallocated message type number space specified in the GTPP message table defined in TS 29.060.

The number ranges allocated for GTPP are as follows:

For Information Elements: 117-127 (TV type fields) and 239-254 (for TLV type fields).

The following table provides the information on the TLV and TV Information Element types introduced in this document:

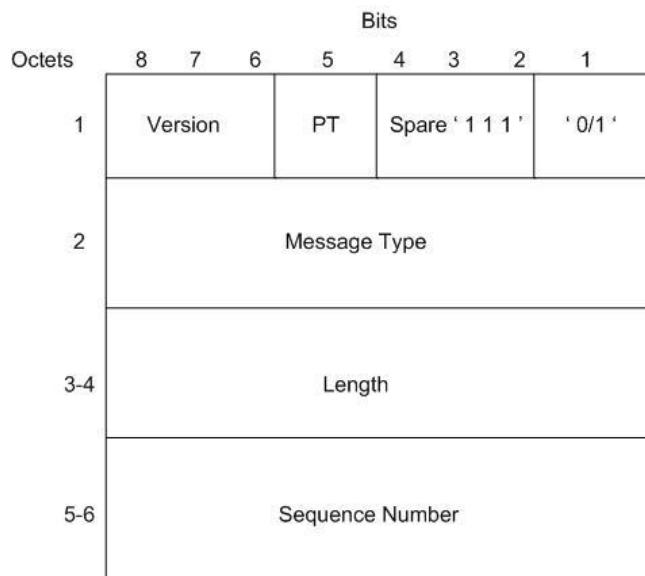
**Table 3. TLV and TV Information Element Types**

<b>TLV Information Element Types</b>	
254	Address of Recommended Node
253	Requests Responded
252	Data Record Packet
251	Charging Gateway Address (this IE is also used in TS 29.060 [200])
250	Sequence Numbers of Canceled Packets
249	Sequence Numbers of Released Packets
<b>TV Information Element Types</b>	
127	Charging ID
126	Packet Transfer Command

## Usage of GTPP Header in Charging

In GTPP messaging only the signalling plane of GTPP is partly reused. The GTPP header is shown in the following figure.

Figure 4. GTPP Header



Bit 5 of octet 1 of the GTPP header is the Protocol Type (PT) flag: it is '0' if the message is GTPP.

The Version bits indicate the GTPP protocol version when the Protocol Type flag is '0'.

Bit 1 of octet 1 is not used in GTPP (except in v0), and it is marked '0' in the GTPP header. It is in use in GTPP v0 and distinguishes the used header-length. In the case of GTPP v0, this bit being marked one (1) indicates the usage of the 6 octets header. If the bit is set to '0' (usually the case) the 20-octet header is used. For all other versions of GTPP, this bit is not used and is set to '0'. However, this does not suggest the use of the 20-octet header, rather a shorter 6-octet header.

The Length indicates the length of payload (number of octets after the GTPP header). The Sequence Number of the packet is part of the GTPP header.

## Information Elements

The messages contain several Information Elements (IEs). The TLV (Type, Length, Value) or TV (Type, Value) encoding formats will be used for the GTPP IEs. The GTPP messages have the IEs sorted with the *Type* fields in ascending order. The *Length* field contains the IE length excluding the Type and Length fields.

Within the *Type* field the most significant bit will be set to 0 when the TV format is used and set to 1 when the TLV format is used.

# GTPP Messages

This section provides the detailed information on the GTPP message types.

## Node Alive Request

The Node Alive Request message may be used to inform that a node in the network has started its service (e.g. after a service break due to software or hardware maintenance or data service interruption after an error condition). A node may send a different Node Address than its own in the Information Element, e.g. informing the "next node in the chain" that the "previous node in the chain" (which is located on the other side of the sender of this message) is now ready for service.

The Node Alive Request message allows a quicker reconnect capability than the Echo Request message based polling can provide, and its usage will have a reduced load effect on the network, particularly when the number of network nodes using GTPP is high. It may also be used to inform when a new network node has become available for service. If the Echo Request message is also used, then the usage of the Node Alive Request message allows the interval of Echo Requests to be longer, thus reducing network load by reducing number of Echo Requests.



**Important:** Node Alive request messages are not supported if the transport layer protocol is TCP.

The Information elements in a Node Alive Request message are shown in the following table:

**Table 4. Node Alive Request Message**

Information Element	Presence Requirement
Node Address	Mandatory
Alternative Node Address	Optional
Private Extension	Optional

The Node Address format is the same as for the Charging Gateway Address format described in TS 29.060.

The format definition for the Node Address information element is the same as the format of the source and destination address of the IP packet that transports the GTPP messages. The optional Alternative Node Address IE can be used in the Node Alive Request if the message sender wants to advertise an IP address that is different from the node address format. This way both the IPv4 and IPv6 node address formats can be supported simultaneously in the messaging, regardless of whether IPv4 or IPv6 is used in the underlying transport.

The optional Private Extension IE contains vendor- or operator-specific information.

## Node Alive Response

The *Node Alive Response* message, shown in the following table, shall be sent as a response to a received *Node Alive Request*.

**Table 5. Node Alive Response Message**

Information Element	Presence Requirement
Private Extension	Optional

The optional Private Extension IE contains vendor- or operator-specific information.

## Redirection Request

There are two use cases for the Redirection Request message:

- One is to advise that received CDR traffic is to be redirected to another CGF due to the sending CGF node is about to stop service (due to an outage for maintenance or an error condition).
- The second purpose is to inform a CDF which is currently sending data to this node (e.g. CGF), that the next node in the chain (e.g. a mediator device or Billing Computer) has lost connection to this node (e.g. CGF).

The Information Elements in a Redirection Request Message are listed in the following table. An *Address of Recommended Node* may be given if, for example, a CGF maintenance outage is handled by first introducing another CGF ready to take incoming CDRs. This way, the network performance can be maintained. The *Address of Recommended Node* shall only describe an intra-PLMN node containing a CGF, and not a node in any other PLMN.

**Table 6. Redirection Request Message**

Information Element	Presence Requirement
Cause	Mandatory
Address of Recommended Node	Optional
Alternative Address of Recommended Node	Optional
Private Extension	Optional

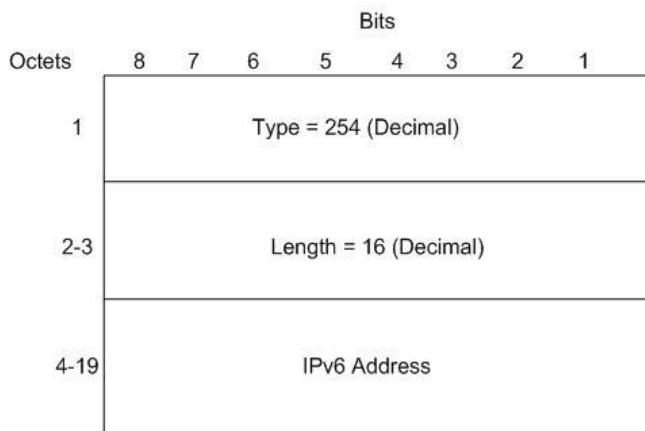
Possible Cause values are:

- This node is about to go down
- Another node is about to go down

- System failure
- Receive buffers becoming full
- Send buffers becoming full

The Address of Recommended Node IE, shown in the following figure, defines the IPv4 or IPv6 format address that the node is identified by in the UMTS network.

**Figure 5. Address of Recommended Node IE**



The format definition for the Address of Recommended Node information element is the same as the format of the source and destination address of the IP packet that transports the GTPP messages. The optional Alternative Address of Recommended Node IE can be used in the Node Alive Request if the message sender wants to advertise an IP address that is different from the node address format. This way both the IPv4 and IPv6 node address formats can be supported simultaneously in the messaging, regardless of whether IPv4 or IPv6 is used in the underlying transport.

The optional Private Extension contains vendor- or operator- specific information.

## Redirection Response

A Redirection Response message shall be sent as a response of a received Redirection Request.

The information elements of this message are listed in the following table.

**Table 7. Redirection Response Message**

Information Element	Presence Requirement
Cause	Mandatory
Private Extension	Optional

Possible Cause values are:

- Request Accepted
- No resources available
- Service not supported
- System failure
- Mandatory IE incorrect
- Mandatory IE missing
- Optional IE incorrect
- Invalid message format
- Version not supported

The optional Private Extension contains vendor- or operator-specific information.

## Data Record Transfer Request

This message is used to transmit the CDR(s) to the CGF.

The CDRs are placed in the Data Record Packet information element.

### Information Elements in Data Record Transfer Request

The IEs in Data Record Transfer Request message are specified in the following table.

*Table 8. Data Record Transfer Request Message*

Information Element	Presence Requirement
Packet Transfer Command	Mandatory
Data Record Packet	Conditional
Sequence Numbers of Released Packets	Conditional
Sequence Numbers of Canceled Packets	Conditional
Private Extension	Optional

### Packet Transfer Command IE

The value of the Packet Transfer Command in its Information Element tells the nature of the message:

- 1 = 'Send Data Record Packet'

- 2 = 'Send possibly duplicated Data Record Packet'
- 3 = 'Cancel Data Record Packet'
- 4 = 'Release Data Record Packet'

The following describes the usage of each Packet Transfer Command. The first command is for normal CDR transfer while the other values are only used as part of the redundancy mechanism. The following describes the usage of each Packet Transfer Command. The first command is for normal CDR transfer while the other values are only used as part of the redundancy mechanism.

**Send Data Record Packet:** This is the usual command used for sending CDRs under normal conditions when no error recovery is needed or the redirection mechanism is not involved. The other three commands are being used only in error recovery cases. Out of the three conditional IEs, only the "Data Record Packet" is present in this message.

**Send possibly duplicated Data Record Packet:** When the CDR packet is redirected to a secondary CGF (by a CDF) because the currently used CGF is not working or the CDR transfer is not working properly, or if there is an error in the link between the CDF and the CGF, then this Packet Transfer Command is used instead of the normal 'Send Data Record Packet'. Of the conditional IEs, the "Data Record Packet" is present in the message, when sending the message to a CGF acting as temporary storage, when the original primary CGF could not be contacted. This Packet Transfer Command is used also when sending "empty" test packets with older (but not yet acknowledged) sequence numbers after a peer node or link recovery, to check if the CGF had received some Data Record Packets (whose acknowledgement did not come to the Data Record Packet sending node) before the link to the recipient node became inoperable.

**Cancel Data Record Packet:** Of the conditional IEs, the "Sequence Numbers of Canceled Packets" is present in the message.

**Release Data Record Packet:** Of the conditional IEs, the "Sequence Numbers of Released Packets" is present in the message.

After the CGF has received the Packet Transfer Command 'Release Data Record Packet' with the Sequence Number(s) for earlier sent 'Send possibly duplicated Data Record Packet' command(s), it can consider itself authorized to send the Data Record Packets previously marked as possibly duplicated towards the BD as normal (not duplicated) CDRs.

## Data Record Packet IE

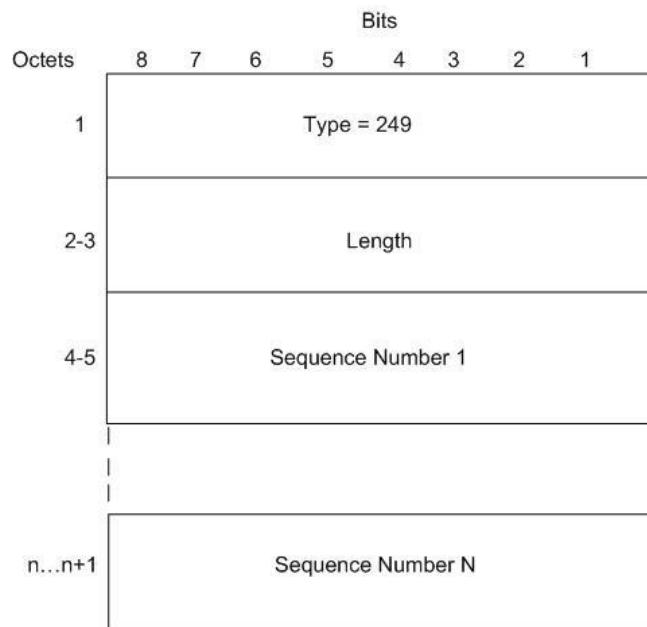
The Data Record Packet element, which is present conditionally if the Packet Transfer Command is 'Send Data Record Packet' or 'Send possibly duplicated Data Record Packet', may contain one or more CDRs. If an "empty packet" is to be sent, then the Data Record Packet IE contains only the Type (with value 252 in decimal) and the Length (with value 0) fields.

There are two fields identifying the CDR format: Data Record Format and Data Record Format Version.

The format of the CDRs is ASN.1 or some other format, as identified by the value of Data Record Format. The Data Record Format Version identifies the TS release and version numbers that were used for the CDR encoding.

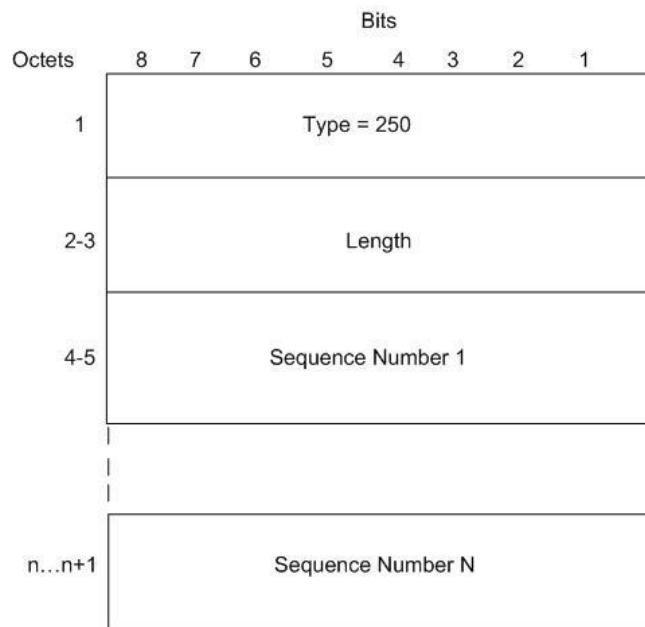
## Sequence Numbers of Released Packets IE

The Sequence Numbers of Released Packets is present if the Packet Transfer Command is 'Release Data Record Packet'. The format of the Information Element is described in the following figure:

**Figure 6. Sequence Numbers of Released Packets IE**

## Sequence Numbers of Canceled Packets IE

The following figure shows the sequence numbers of Canceled Packets IE that contains the IE Type, Length and the Sequence Number(s) (each 2 octets) of the canceled Data Record Transfer Request(s). It is present if the Packet Transfer Command is "Cancel Data Record Packet".

**Figure 7. Sequence Numbers of Canceled Packets IE**

## Private Extension IE

The optional Private Extension contains vendor- or operator- specific information.

## Data Record Transfer Response

The message shall be sent as a response to a received Data Record Transfer Request. Also, several Data Record Transfer Requests can be responded by a single Data Record Transfer Response.

The Cause (whatever the value may be) applies for all those Data Record Transfer Requests, responded by that particular Data Record Transfer Response.

Possible Cause values are:

- Request Accepted
- No resources available
- Service not supported
- System failure
- Mandatory IE incorrect
- Mandatory IE missing
- Optional IE incorrect

- Invalid message format
- Version not supported
- Request not fulfilled
- CDR decoding error
- Request already fulfilled
- Request related to possibly duplicated packet already fulfilled
- Sequence numbers of released/canceled packets IE incorrect

The cause value "CDR decoding error" is optional, primarily intended to inform the CDF that the receiving node cannot decode the CDR. Thus, special features in the receiving node that are based on information within the CDR, would not be operable. This message alerts the operator of a remote generating node of incompatible CDR encoding. It is optional and no action or response is required.

The Requests Responded IE contains the IE Type, Length and the Sequence Numbers (each 2 octets) of the Data Record Transfer Requests.

The optional Private Extension contains vendor- or operator- specific information. Depending on the Cause value severity and general occurrence frequency, the node that sent the corresponding Data Record Transfer Request, may start to direct its CDRs to another CGF.

## Handling Error Response Cause

By default, on getting an error response, the request is retried to the same CGF server until max-retries is reached. Then the server is marked as NOT ACTIVE and the request is retried to the secondary server. This behavior is seen for the below response causes.

- Mandatory IE incorrect
- Mandatory IE missing
- Optional IE incorrect
- Invalid message format

On getting the following error response causes, the request will NOT be retried and the server will be marked as NOT ACTIVE immediately.

- No resources available
- Service not supported
- System failure

No special action is taken on getting "CDR Decoding error" response cause and the behavior is similar to getting a "Request Accepted" cause.

On getting "Version not supported" cause, the request is resent with the version supported by the CGF server (by default, GTPP v2 is supported).

# GTPP Configuration

Cisco Systems' GGSN/P-GW/S-GW supports both GTPP- and RADIUS-based accounting. The accounting protocol is configured on a per-APN basis.

When the GPRS Tunneling Protocol Prime (GTPP) protocol is used, accounting messages are sent to the Charging Gateways (CGs) over the Ga interface. The Ga interface and GTPP functionality are typically configured within the system's source context. As specified by the standards, a CDR is not generated when a session starts. CDRs are generated according to the interim triggers configured using the charging characteristics configured for the GGSN, and a CDR is generated when the session ends. For interim accounting, STOP/START pairs are sent based on configured triggers.

GTPP version 2 is always used. However, if version 2 is not supported by the Charging Gateway Function (CGF), the system reverts to using GTPP version 1. All subsequent CDRs are always fully-qualified partial CDRs. GTPP version 0 is not supported.

GTPP is configured at the routing context level. Some of the configurables associated with GTPP are *Attributes*, *Charging Agent*, *Deadtime*, etc. The GTPP configuration commands vary according to the services configured, for example, the commands used for GGSN might differ from what is configured for P-GW. For more information on the configuration commands, refer to the *Cisco ASR 5000 Series Command Line Interface Reference*.

# Charging Characteristics

Whether or not the GGSN accepts charging characteristics from the SGSN, the accounting protocol can be configured on a per-APN basis based on whether the subscriber is visiting, roaming or, home.

By default, the GGSN always accepts the charging characteristics from the SGSN. They will be provided by the SGSN for GTPv1 requests for primary PDP contexts. If they are not provided for secondary PDP contexts, the GGSN re-uses those from the primary. The charging characteristics field is optional. If not provided by SGSN the GGSN selects the locally configured values. Also, there is a provision to override the values from RADIUS as indicated in the following table.

CLI command configured on GGSN	Sent by SGSN	Sent by AAA	CC used
<b>no cc-sgsn</b>	<b>no cc</b>	<b>no cc</b>	Default
		<b>cc</b>	Default
	<b>cc</b>	<b>no cc</b>	SGSN
		<b>cc</b>	SGSN
<b>cc-sgsn use-ggsn</b>	<b>no cc</b>	<b>no cc</b>	GGSN
		<b>cc</b>	GGSN
	<b>cc</b>	<b>no cc</b>	GGSN
		<b>cc</b>	GGSN
<b>cc-sgsn radius-returned</b>	<b>no cc</b>	<b>no cc</b>	Default
		<b>cc</b>	AAA
	<b>cc</b>	<b>no cc</b>	SGSN
		<b>cc</b>	AAA
<b>cc-sgsn radius-returned use-ggsn</b>	<b>no cc</b>	<b>no cc</b>	GGSN
		<b>cc</b>	AAA
	<b>cc</b>	<b>no cc</b>	GGSN
		<b>cc</b>	AAA

If the system is configured to reject the charging characteristics from the SGSN, the GGSN can be configured with its own that can be applied based on the subscriber type (visiting, roaming, or home) at the APN level. The charging characteristics consists of a string of 16 bits designated as profile index and behavior settings. The GGSN supports up to 16 profile indexes numbered 0 through 15 whereas P-GW/S-GW supports up to a maximum of 256 charging profiles.

The profile indexes specify the criteria for closing accounting records based on specific criteria.

When a bearer is activated, an appropriate charging profile will be selected based on the following sources of input:

- Downloaded AAA attribute (ONLY in P-GW)
- MME/HSS via charging characteristics IE

- Local defaults

Following is the order of precedence when charging profile value is received from multiple sources.

- Profile index in the override rule on the APN
- Profile index in the override rule on the gateway
- Profile index from AAA in case of P-GW
- Profile index from non-override rule on the APN
- Profile index from non-override rule on the gateway

For more information on the commands that configure additional GTPP accounting properties, refer to the *Cisco ASR 5000 Series Command Line Interface Reference*.

## GTPP Accounting Interface in ECS

Enhanced Charging Service (ECS) supports different accounting and charging interfaces for prepaid and postpaid charging and record generation.

GTPP accounting in ECS allows the collection of counters for different types of data traffic and including that data in a G-CDR that is sent to the CGF.

Standard G-CDRs do not have an attribute which defines traffic counters depending upon the traffic type but they do have a field named Record Extensions where all vendor specific information can be included. ECS includes the counters for different types of data traffic in this field when sending a G-CDR.

# Charging Record Generation

ECS provides for the generation of charging data files, which can be periodically retrieved from the system and used as input to a billing system for post-processing.

The results of traffic analyzer are used to generate session usage data. The generated usage data are in a standard format, so that the impact on the existing billing system is minimal and at the same time, these records contain all the information required for billing based on the content.

The accounting records also contain the information to identify the user, with Dynamic address assignment and information to obtain the URL for HTTP content request or a file-name or path from FTP request, the type of service from the first packet of the connection, and transaction termination information so that the billing system can decide transaction success or failure.

Charging records support details of the termination such as which end initiated the termination, termination type e.g. RST, FIN, etc. and in case of HTTP 1.1, whether or not the connection is still open. ECS supports pipelining of up to 15 HTTP requests on the same TCP connection. The billing system, based on this information, decides upon the success or failure of the connection and charge or refund accordingly.

To cover the requirements of standard solutions and at the same time, provide flexible and detailed information on service usage, ECS provides the following types of usage records:

- Standard GGSN Call Detail Records (G-CDRs)
- Enhanced GGSN Call Detail Records (eG-CDRs)

The ASR 5000 Series Multimedia Core Platform supports multiple fields for use in G-CDRs and eG-CDRs. All G-CDRs and eG-CDRs are encoded using the ASN.1 format and are sent to the CGF using the GTPP.



**Important:** The behavior for several of the fields supported in CDRs can be modified. For more information, refer to the *Cisco ASR 5000 Series Command Line Interface Reference*.

## Standard GGSN Call Detail Records (G-CDRs)

G-CDRs are generated according to 3GPP TS 32.251 V6.6.0. Currently ECS supports generation of CDRs using AAAMgrs only.

### G-CDR Format

The G-CDRs can be in ASN.1 Format.

## Enhanced GGSN Call Detail Records (eG-CDRs)

The ECS also supports enhanced G-CDRs, which is an enhanced format of standard G-CDRs to provide greater portability of charging information. eG-CDRs are compliant with 3GPP TS 32.298 v6.5.0 for Rel. 6 based dictionaries, and with 3GPP TS 32.298 v7.4.0 for Rel. 7 based dictionaries.

By default, the G-CDR does not support the traffic and vendor specific records. To support a traffic and vendor specific record, the ECS must be configured to generate eG-CDRs. eG-CDRs are useful to implement Time Based Charging (TBC) and Flow Based bearer Charging (FBC) to ECS.

eG-CDR supports customer specific formats configured in Ga context in a GGSN service with standard or custom specific GTPP dictionaries.

### eG-CDR Format

The eG-CDRs can be in ASN.1 Format.

For more information on G-CDR and eG-CDR attributes and definitions, refer to the *G-CDR and Enhanced G-CDR Field Descriptions* chapter in this reference guide.

## PDN Gateway Call Detail Records (PGW-CDRs)

PGW-CDRs are generated according to 3GPP TS 32.298 V8.5.0.

### PGW-CDR Format

The PGW-CDRs can be in ASN.1 Format.

## Serving Gateway Call Detail Records (SGW-CDRs)

SGW-CDRs are generated according to 3GPP TS 32.298 V8.5.0.

### SGW-CDR Format

The SGW-CDRs can be in ASN.1 Format.

# Sample GTPP Configuration

This section provides an example of the sample GTPP configuration applied to various products.

## Sample Configuration for GGSN/PGW

This section provides an example of the sample GTPP configuration for GGSN and PGW.

1. Configure the GTPP group and accounting context configuration in APN level and also specify the accounting-mode.

```
configure

context source

apn apnname1.com

accounting-mode gtp

gtp group group1 accounting-context billing

end
```

2. Configure the GTPP group related parameters like GTPP server parameters, GTPP dictionary, and optionally CGF to support GTPP accounting:

```
configure

context source

gtp group group1

gtp charging-agent address 1.2.3.4 port 3386

gtp server 1.3.5.6 max msgs priority 1

gtp dictionary dict1

gtp max-cdr 255 wait-time 10

gtp transport-layer udp

end
```



**Important:** For GGSN, accounting context can also be configured in GGSN service. In this case more priority will be given to the APN level configuration. In APN level, if no accounting context is configured then accounting context configured in GGSN service shall be considered.

```
configure
```

```

context source

ggsn-service ggsn1

accounting context billing

end

```

## Sample Configuration for SGW

This section provides an example of the sample GTPP configuration for SGW.

1. In subscriber level configure GTPP in the accounting-mode.

```

configure

context dest1

subscriber default

accounting-mode gtpp

end

```

2. Configure accounting policy in context level. This is required only for time/tariff/volume threshold configuration.

```

configure

context dest1

policy accounting lte

cc profile 1 interval 60

cc profile 1 volume total 100000

cc profile 1 tariff time 1 0 0 time 2 2 2 time 3 4 4 time 4 5
5

cc profile 1 buckets 3

cc profile 1 serving-nodes 4

end

```

3. Associate the accounting policy with the SGW service.

```

configure

context source

sgw-service sgw1

```

```
associate accounting-policy lte
end
```

4. Configure the accounting context and GTPP group in SGW service level. If accounting context is not configured in SGW service the source context and "default" GTPP group will be selected.

```
configure
  context source
    sgw-service sgw1
    accounting context dest1 gtpp group sgw
  end
```

5. Configure the GTPP group related parameters.

```
configure
  context source
    gtpp group group1
    gtpp charging-agent address 1.2.3.4 port 3386
    gtpp server 1.3.5.6 max msgs priority 1
    gtpp dictionary dict1
    gtpp max-cdr 255 wait-time 10
    gtpp transport-layer udp
  end
```

# Chapter 8

## G-CDR and Enhanced G-CDR Field Reference Tables

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This chapter provides reference tables for the CDR fields reported as part of GGSN-CDRs (G-CDRs) and enhanced G-CDRs (eG-CDRs) generated by the system.

A complete list of supported CDR fields is provided in the *G-CDR and Enhanced G-CDR Field Descriptions* chapter of this reference guide.

The specific CDRs reported in G-CDRs/eG-CDRs and their encoding are user-selectable via GTPP dictionaries. The use of GTPP dictionaries is configurable using the **gtpo dictionary** command in the Context Configuration Mode of the system's Command Line Interface (CLI).

This section provides information on the fields reported in G-CDRs/eG-CDRs for the GTPP dictionaries.



**Important:** For more information on custom dictionaries, contact your local service representative.

The category column in all tables use keys described in the following table.

**Table 9. Dictionary Table Key**

Abbreviation	Meaning	Description
M	Mandatory	A field that must be present in the CDR.
C	Conditional	A field that must be present in a CDR if certain conditions are met.
O <sub>M</sub>	Operator Provisionable: Mandatory	A field that an operator has provisioned and must be included in the CDR for all conditions.
O <sub>C</sub>	Operator Provisionable: Conditional	A field that an operator has provisioned that must included in the CDR if certain conditions are met.

# CDR Fields Supported in G-CDRs

The tables in this section list the G-CDR fields present in the available GTPP dictionaries.

## custom1 – custom4 Dictionaries

G-CDR fields based on 3GPP TS 32.015 V3.6.0 (2001-06) (R99).

Field	Category	Description
Record Type	M	GPRS GGSN PDP context record.
Network Initiated PDP Context	C	Present if this is a network-initiated PDP context.
Served IMSI	M	IMSI of the served party (if Anonymous Access Indicator is FALSE or not supplied).
Served MSISDN	O	The primary MSISDN of the subscriber.
GGSN Address	M	The IP address of the GGSN used.
Charging ID	M	PDP context identifier used to identify this PDP context in different records created by GSNs.
SGSN Address	M	List of SGSN addresses used during this record.
Access Point Name Network Identifier	M	The logical name of the connected access point to the external packet data network (network identifier part of APN).
APN Selection Mode	O	An index indicating how the APN was selected.
PDP Type	M	PDP type, i.e. IP, PPP, or IHOSS:OSP.
Served PDP Address	M	PDP address, i.e. IPv4 or IPv6.
Dynamic Address Flag	C	Indicates whether served PDP address is dynamic, which is allocated during PDP context activation.

List of Traffic Data Volumes	M	A list of changes in charging conditions for this PDP context, each time stamped. Charging conditions are used to categorize traffic volumes, such as per tariff period. Initial and subsequently changed QoS and corresponding data values are listed. In GSM, data volumes are in octets above the GTP layer and are separated for uplink and downlink traffic. In 3G, data volumes are in octets above the GTP-U layer and are separated for uplink and downlink traffic.
Record Opening Time	M	Time stamp when this record was opened.
Duration	M	Duration of this record in the GGSN.
Cause for Record Closing	M	The reason for the release of record from this GGSN.
Diagnostics	O	A more detailed reason for the release of the connection.
Record Sequence Number	C	Partial record sequence number, only present in case of partial records.
Node ID	O	Name of the recording entity.
Record Extensions	O	A set of network/manufacturer specific extensions to the record.
Local Record Sequence Number	O	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
Charging Characteristics	C	The Charging Characteristics flag retrieved from subscriber's data as described in TS 32.015 V3.6.0 sub clause 6.1.6.5.

Notes:

- custom2 and custom3 dictionaries:
  - All IP addresses are encoded in binary format.
- custom4 dictionary:
  - All IP addresses are encoded in binary format.
  - Data Record Format Version IE contains 0x1307 instead of 0x1308.
  - QoSRequested is not present in the LoTV containers.
  - QoSNegotiated is added only for the first container and the container after QoSChange condition.

## custom5 – custom7, custom9, custom12, custom14, custom15, custom17, custom19, custom20, and custom22 Dictionaries

G-CDR fields based on 3GPP TS 32.298 V6.6.0 (2006-12) (R6).

Field	Category	Description
Record Type	M	GGSN PDP context record.
Network initiated PDP context	O <sub>c</sub>	A flag that is present if this is a network-initiated PDP context.
Served IMSI	M	IMSI of the served party.
Served IMEISV	O <sub>c</sub>	IMEISV of the ME, if available.
GGSN Address	M	The control plane IP address of the GGSN used.
Charging ID	M	PDP context identifier used to identify this PDP context in different records created by GSNs.
SGSN Address	M	List of SGSN addresses used during this record.
Access Point Name Network Identifier	O <sub>M</sub>	The logical name of the connected access point to the external packet data network (network identifier part of APN).
PDP Type	O <sub>M</sub>	PDP type, i.e. IP, PPP, or IHOSS:OSP.
Served PDP Address	O <sub>c</sub>	PDP address, i.e. IPv4 or IPv6. This parameter shall be present except when both the PDP type is PPP and dynamic PDP address assignment is used.
Dynamic Address Flag	O <sub>c</sub>	Indicates whether served PDP address is dynamic, which is allocated during PDP context activation. This field is missing if address is static.
List of Traffic Data Volumes	O <sub>M</sub>	A list of changes in charging conditions for this PDP context, each change is time stamped. Charging conditions are used to categorize traffic volumes, such as per tariff period. Initial and subsequently changed QoS and corresponding data values are also listed.
Record Opening Time	M	Time stamp when PDP context is activated in this GGSN or record opening time on subsequent partial records.

MS Time Zone	O <sub>c</sub>	This field contains the MS Time Zone the MS is currently located as defined in TS 29.060, if provided by SGSN.
Duration	M	Duration of this record in the GGSN.
Cause for Record Closing	M	The reason for the release of record from this GGSN.
Diagnostics	O <sub>M</sub>	A more detailed reason for the release of the connection.
Record Sequence Number	C	Partial record sequence number, only present in case of partial records.
Node ID	O <sub>M</sub>	Name of the recording entity.
Record Extensions	O <sub>c</sub>	A set of network operator/manufacturer specific extensions to the record. Conditioned upon the existence of an extension.
Local Record Sequence Number	O <sub>M</sub>	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
APN Selection Mode	O <sub>M</sub>	An index indicating how the APN was selected.
Served MSISDN	O <sub>M</sub>	The primary MSISDN of the subscriber.
User Location Information	O <sub>c</sub>	This field contains the User Location Information of the MS as defined in TS 29.060, if provided by SGSN.
Charging Characteristics	M	The Charging Characteristics applied to the PDP context.
Charging Characteristics Selection Mode	O <sub>M</sub>	Holds information about how Charging Characteristics were selected.
IMS Signalling Context	O <sub>c</sub>	Included if the IM-CN Subsystem Signalling Flag is set, TS 23.060 PDP context is used for IMS signalling.
External Charging Identifier	O <sub>c</sub>	Holds a Charging Identifier and is present only if it is received from a non-GPRS, external network entity.
SGSN PLMN Identifier	O <sub>M</sub>	SGSN PLMN Identifier (MCC and MNC) used during this record.
CAMEL Information	O <sub>c</sub>	Set of CAMEL information related to PDP context. This field is present if CAMEL Charging Information is received by the GGSN in the GTP Create PDP context request.

## ■ CDR Fields Supported in G-CDRs

RAT Type	O <sub>c</sub>	This field indicates the Radio Access Technology (RAT) type currently used by the Mobile Station as defined in TS 29.060. The field is present in the G-CDR if provided by SGSN.
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Notes:

- QoSRequested is not present in the LoTV containers.
- QoSNegotiated is added only for first container and container after QoSChange condition.
- Camel Info, IMS Signaling Context, and External Charging Identifier are not supported in the G-CDR.
- custom14 dictionary: All IP addresses are represented in text.
- custom22 dictionary: Supports customer-specific Transparent-Data record extension.

## standard, custom8, custom10, custom11, custom13, custom18, custom21, custom23 – custom29 Dictionaries

G-CDR fields based on 3GPP TS 32.215 V4.6.0 (2003-12) (R4).

Field	Category	Description
Record Type	M	GGSN PDP context record.
Network initiated PDP context	O <sub>c</sub>	A flag that is present if this is a network-initiated PDP context.
Served IMSI	M	IMSI of the served party.
GGSN Address	M	The control plane IP address of the GGSN used.
Charging ID	M	PDP context identifier used to identify this PDP context in different records created by GSNs.
SGSN Address	M	List of SGSN addresses used during this record.
Access Point Name Network Identifier	O <sub>M</sub>	The logical name of the connected access point to the external packet data network (network identifier part of APN).
PDP Type	O <sub>M</sub>	PDP type, i.e. IP, PPP, or IHOSS:OSP

Served PDP Address	O <sub>c</sub>	PDP address, i.e. IPv4 or IPv6. This parameter shall be present except when both the PDP type is PPP and dynamic PDP address assignment is used.
Dynamic Address Flag	O <sub>c</sub>	Indicates whether served PDP address is dynamic, which is allocated during PDP context activation. This field is missing if address is static.
List of Traffic Data Volumes	O <sub>m</sub>	A list of changes in charging conditions for this PDP context, each change is time stamped. Charging conditions are used to categorise traffic volumes, such as per tariff period. Initial and subsequently changed QoS and corresponding data values are listed.
Record Opening Time	M	Time stamp when PDP context is activated in this GGSN or record opening time on subsequent partial records.
Duration	M	Duration of this record in the GGSN.
Cause for Record Closing	M	The reason for the release of record from this GGSN.
Diagnostics	O <sub>m</sub>	A more detailed reason for the release of the connection.
Record Sequence Number	C	Partial record sequence number, only present in case of partial records.
Node ID	O <sub>m</sub>	Name of the recording entity.
Record Extensions	O <sub>c</sub>	A set of network operator/manufacturer specific extensions to the record. Conditioned upon the existence of an extension.
Local Record Sequence Number	O <sub>m</sub>	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
APN Selection Mode	O <sub>m</sub>	An index indicating how the APN was selected.
Served MSISDN	O <sub>m</sub>	The primary MSISDN of the subscriber.
Charging Characteristics	M	The Charging Characteristics applied to the PDP context.
Charging Characteristics Selection Mode	O <sub>m</sub>	Holds information about how Charging Characteristics were selected.
SGSN PLMN Identifier	O <sub>m</sub>	SGSN PLMN identifier (MCC and MNC) used during this record.

## custom16 Dictionary

G-CDR fields based on 3GPP TS 32.215 V4.5.0 (2003-09) (R4).

Field	Category	Description
Record Type	M	SGSN PDP context record.
Served IMSI	M	IMSI of the served party.
Served IMEI	O <sub>c</sub>	The IMEI of the ME, if available.
List of SGSN Address	M	The IP address of the current SGSN.
Charging ID	M	PDP context identifier used to identify this PDP context in different records created by GSNs.
GGSN Address	M	The control plane IP address of the GGSN currently used. The GGSN address is always the same for an activated PDP context.
Access Point Name Network Identifier	M	The logical name of the connected access point to the external packet data network (network identifier part of APN).
Dynamic Address Flag	M	The flag indicating that the PDP address has been dynamically allocated.
PDP Type	M	PDP type, i.e. IP, PPP, IHOSS:OSP.
Served PDP Address	M	PDP address of the served IMSI, i.e. IPv4 or IPv6. This parameter shall be present except when both the PDP type is PPP and dynamic PDP address assignment is used.
List of Traffic Data Volumes	M	A list of changes in charging conditions for this PDP context, each change is time stamped. Charging conditions are used to categorise traffic volumes, such as per QoS/tariff period. Initial and subsequently changed QoS and corresponding data volumes are listed (Only QOS negotiated is present).
Record Opening Time	M	Time stamp when PDP context is activated in this SGSN or record opening time on subsequent partial records.
Duration	M	Duration of this record in the SGSN.

Cause for Record Closing	M	The reason for closure of the record from this SGSN.
Diagnostics	O <sub>M</sub>	A more detailed reason for the release of the connection.
Record Sequence Number	M	Partial record sequence number in this SGSN. Only present in case of partial records.
Node ID	M	Name of the recording entity.
Local Record Sequence Number	M	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
Time Zone	M	Customer-specific. The difference between UTC and local time for the change time.
APN Selection Mode	M	An index indicating how the APN was selected.
Served MSISDN	M	The primary MSISDN of the subscriber.
Charging Characteristics	M	The charging characteristics applied to the PDP context.
Charging Characteristics Selection Mode	M	Holds information about how charging characteristics were selected.
SGSN PLMN identifier	M	PLMN ID of the SGSN.
Charging Type Selection Mode	M	The field indicating how the charging type field was selected.
Charging Profile	M	Customer-specific. The field indicates the user profile. The possible values are: <ul style="list-style-type: none"> <li>• prepaid</li> <li>• post-paid</li> <li>• HLR</li> </ul>
Charging Type	M	Customer-specific. The field indicates the type of the G-CDR generated. The possible values are: <ul style="list-style-type: none"> <li>• normal record</li> <li>• prepaid record</li> <li>• hot billing record</li> <li>• Flat billing</li> </ul>
access type	M	Customer-specific. The field indicates the user's access type.

Notes:

- Except diagnostics and IMEI all fields are mandatory.
- Instead of “RAT Change” trigger, “Intra SGSN Inter System” trigger is used.
- IP address is binary encoded.

## custom30 Dictionary

G-CDR fields based on 3GPP TS 32.298 V6.4.1 (R6).

Field	Category	Description
Record Type	M	GPRS GGSN PDP context record.
Served IMSI	M	IMSI of the served party (if Anonymous Access Indicator is FALSE or not supplied).
GGSN Address	M	The IP address of the GGSN used.
Charging ID	M	PDP context identifier used to identify this PDP context in different records created by GSNs.
SGSN Address	M	List of SGSN addresses used during this record.
Access Point Name Network Identifier	M	The logical name of the connected access point to the external packet data network (network identifier part of APN).
PDP Type	M	PDP type, i.e. IP, PPP, or IHOSS:OSP
Served PDP Address	M	PDP address, i.e. IPv4 or IPv6 address.
Dynamic Address Flag	C	Indicates whether served PDP address is dynamic, which is allocated during PDP context activation.

List of Traffic Data Volumes	M	A list of changes in charging conditions for this PDP context, each time stamped. Charging conditions are used to categorize traffic volumes, such as per tariff period. Initial and subsequently changed QoS and corresponding data values are also listed. In GSM, data volumes are in octets above the GTP layer and are separated for uplink and downlink traffic. In 3G, data volumes are in octets above the GTP-U layer and are separated for uplink and downlink traffic.
Record Opening Time	M	Time stamp when this record was opened.
Duration	M	Duration of this record in the GGSN.
Cause for Record Closing	M	The reason for the release of record from this GGSN.
Record Sequence Number	C	Partial record sequence number, only present in case of partial records.
Node ID	O	Name of the recording entity.
Record Extensions	O	A set of network/ manufacturer specific extensions to the record.
Local Record Sequence Number	O	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
APN Selection Mode	O	An index indicating how the APN was selected.
Served MSISDN	O	The primary MSISDN of the subscriber.
Charging Characteristics	M	The Charging Characteristics flag retrieved from subscriber's data as described in TS 32.015 sub clause 6.1.6.5.
Charging Characteristics Selection Mode	O	Holds information about how Charging Characteristics were selected.
External Charging Identifier	O	Holds a Charging Identifier and is present only if it is received from a non-GPRS, external network entity.
SGSN PLMN Identifier	O	SGSN PLMN Identifier (MCC and MNC) used during this record.
Served IMEISV	O	IMEISV of the ME, if available.

## ■ CDR Fields Supported in G-CDRs

RAT Type	O	This field indicates the Radio Access Technology (RAT) type currently used by the Mobile Station as defined in TS 29.060. The field is present in the G-CDR if provided by SGSN.
MS Time Zone	O	This field contains the MS Time Zone the MS is currently located as defined in TS 29.060, if provided by SGSN.
User Location Information	O	This field contains the User Location Information of the MS as defined in TS 29.060, if provided by SGSN.
CAMEL Information	O	Set of CAMEL information related to PDP context. This field is present if CAMEL Charging Information is received by the GGSN in the GTP Create PDP context request.

# CDR Fields Supported in eG-CDRs

The tables in this section list the eG-CDR fields present in the available GTPP dictionaries.

## custom1 Dictionary

eG-CDR fields for TS 32.015 v 3.6.0 (R99).

Field	Category	Description
Record Type	M	GPRS GGSN PDP context record.
Network Initiated PDP Context	C	Present if this is a network-initiated PDP context.
Served IMSI	M	IMSI of the served party (if Anonymous Access Indicator is FALSE or not supplied).
Served MSISDN	O	The primary MSISDN of the subscriber.
GGSN Address	M	The IP address of the GGSN used.
Charging ID	M	PDP context identifier used to identify this PDP context in different records created by GSNs.
SGSN Address	M	List of SGSN addresses used during this record.
Access Point Name Network Identifier	M	The logical name of the connected access point to the external packet data network (network identifier part of APN).
APN Selection Mode	O	An index indicating how the APN was selected.
PDP Type	M	PDP type, i.e. IP, PPP, or IHOSS:OSP.
Served PDP Address	M	PDP address, i.e. IPv4 or IPv6 address.
Dynamic Address Flag	C	Indicates whether served PDP address is dynamic, which is allocated during PDP context activation.

## ■ CDR Fields Supported in eG-CDRs

List of Traffic Data Volumes	M	<p>A list of changes in charging conditions for this PDP context, each time stamped. Charging conditions are used to categorize traffic volumes, such as per tariff period. Initial and subsequently changed QoS and corresponding data values are listed.</p> <p>In GSM, data volumes are in octets above the GTP layer and are separated for uplink and downlink traffic.</p> <p>In 3G, data volumes are in octets above the GTP-U layer and are separated for uplink and downlink traffic.</p> <p> <b>Important:</b> Only one LOTV container per eG-CDR.</p>
Record Opening Time	M	Time stamp when this record was opened.
Duration	M	Duration of this record in the GGSN.
Cause for Record Closing	M	The reason for the release of record from this GGSN.
Record Sequence Number	C	Partial record sequence number, only present in case of partial records.
Node ID	O	Name of the recording entity.
Local Record Sequence Number	O	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
Charging Characteristics	C	The Charging Characteristics flag retrieved from subscriber's data as described in TS 32.015 sub clause 6.1.6.5.

## custom2 Dictionary

eG-CDR fields for TS 32.015 v 3.6.0 (R99).

Field	Category	Description
Record Type	M	GPRS GGSN PDP context record.
Network initiated PDP context	C	Present if this is a network-initiated PDP context.
Served IMSI	M	IMSI of the served party (if Anonymous Access Indicator is FALSE or not supplied).

Served MSISDN	O	The primary MSISDN of the subscriber.
GGSN Address	M	The IP address of the GGSN used.
Charging ID	M	PDP context identifier used to identify this PDP context in different records created by GSNs.
SGSN Address	M	List of SGSN addresses used during this record.
Access Point Name Network Identifier	M	The logical name of the connected access point to the external packet data network (network identifier part of APN).
APN Selection Mode	O	An index indicating how the APN was selected.
PDP Type	M	PDP type, i.e. IP, PPP, or IHOSS:OSP.
Served PDP Address	M	PDP address, i.e. IPv4 or IPv6 address.
Dynamic Address Flag	C	Indicates whether served PDP address is dynamic, which is allocated during PDP context activation.
List of Traffic Data Volumes	M	<p>A list of changes in charging conditions for this PDP context, each time stamped. Charging conditions are used to categorize traffic volumes, such as per tariff period. Initial and subsequently changed QoS and corresponding data values are listed.</p> <p>In GSM, data volumes are in octets above the GTP layer and are separated for uplink and downlink traffic.</p> <p>In 3G, data volumes are in octets above the GTP-U layer and are separated for uplink and downlink traffic.</p>
		 <b>Important:</b> Only one LOTV container per eG-CDR.
Record Opening Time	M	Time stamp when this record was opened.
Duration	M	Duration of this record in the GGSN.
Cause for Record Closing	M	The reason for the release of record from this GGSN.
Record Sequence Number	C	Partial record sequence number, only present in case of partial records.
Node ID	O	Name of the recording entity.

## ■ CDR Fields Supported in eG-CDRs

Record Extensions	O	A set of network operator specific extensions to the record. This includes up to 10 content-ids in a specific format.
Local Record Sequence Number	O	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
Charging Characteristics	C	The Charging Characteristics flag retrieved from subscriber's data as described in TS 32.015 sub clause 6.1.6.5.

Notes:

- custom2 dictionary is license dependant.
- Only Single LOTV container is supported.
- Binary IP addresses are supported.
- Record Extension supports Nortel Content Based Billing V3. 10 content-ids per eG-CDR.
- Both QoS requested and negotiated fields present.
- Release the eG-CDR after traffic for 10th content-id is seen.
- Only single LOTV container is supported.
- RAT change will result in eG-CDR being generated with reason as cause for record closing as “MGMT INTERVENTION”.
- If online charging is in use, in case of OCS (Online Charging System) failure, if Failure handling is set to “continue” then Change condition of LOTV is set to “QoS change”.

## custom3 Dictionary

eG-CDR fields for TS 32.015 v 3.6.0 (R99).

Field	Category	Description
Record Type	M	GPRS GGSN PDP context record.
Network Initiated PDP Context	C	Present if this is a network-initiated PDP context.
Served IMSI	M	IMSI of the served party (if Anonymous Access Indicator is FALSE or not supplied).
Served MSISDN	O	The primary MSISDN of the subscriber.

GGSN Address	M	The IP address of the GGSN used.
Charging ID	M	PDP context identifier used to identify this PDP context in different records created by GSNs.
SGSN Address	M	List of SGSN addresses used during this record.
Access Point Name Network Identifier	M	The logical name of the connected access point to the external packet data network (network identifier part of APN).
APN Selection Mode	O	An index indicating how the APN was selected.
PDP Type	M	PDP type, i.e. IP, PPP, or IHOSS:OSP.
Served PDP Address	M	PDP address, i.e. IPv4 or IPv6 address.
Dynamic Address Flag	C	Indicates whether served PDP address is dynamic, which is allocated during PDP context activation.
List of Traffic Data Volumes	M	<p>A list of changes in charging conditions for this PDP context, each time stamped. Charging conditions are used to categorize traffic volumes, such as per tariff period. Initial and subsequently changed QoS and corresponding data values are listed.</p> <p>In GSM, data volumes are in octets above the GTP layer and are separated for uplink and downlink traffic.</p> <p>In 3G, data volumes are in octets above the GTP-U layer and are separated for uplink and downlink traffic.</p>
		 <b>Important:</b> Only one LOTV container per eG-CDR.
Record Opening Time	M	Time stamp when this record was opened.
Duration	M	Duration of this record in the GGSN.
Cause for Record Closing	M	The reason for the release of record from this GGSN.
Record Sequence Number	C	Partial record sequence number, only present in case of partial records.
Node ID	O	Name of the recording entity.
Local Record Sequence Number	O	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.

## ■ CDR Fields Supported in eG-CDRs

Charging Characteristics	C	The Charging Characteristics flag retrieved from subscriber's data as described in TS 32.015 sub clause 6.1.6.5.
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Notes:

- Only Single LOTV container is supported.
- Supports R99 QoS only.

## custom4 Dictionary

eG-CDR fields for TS 32.015 v 3.6.0 (R99).

Field	Category	Description
Record Type	M	GPRS GGSN PDP context record.
Network Initiated PDP Context	C	Present if this is a network-initiated PDP context.
Served IMSI	M	IMSI of the served party (if Anonymous Access Indicator is FALSE or not supplied).
Served MSISDN	O	The primary MSISDN of the subscriber.
GGSN Address	M	The IP address of the GGSN used.
Charging ID	M	PDP context identifier used to identify this PDP context in different records created by GSNs.
SGSN Address	M	List of SGSN addresses used during this record.
Access Point Name Network Identifier	M	The logical name of the connected access point to the external packet data network (network identifier part of APN).
APN Selection Mode	O	An index indicating how the APN was selected.
PDP Type	M	PDP type, i.e. IP, PPP, or IHOSS:OSP.
Served PDP Address	M	PDP address, i.e. IPv4 or IPv6 address.

Dynamic Address Flag	C	Indicates whether served PDP address is dynamic, which is allocated during PDP context activation.
List of Traffic Data Volumes	M	<p>A list of changes in charging conditions for this PDP context, each time-stamped. Charging conditions are used to categorize traffic volumes, such as per tariff period. Initial and subsequently changed QoS and corresponding data values are listed.</p> <p>In GSM, data volumes are in octets above the GTP layer and are separated for uplink and downlink traffic.</p> <p>In 3G, data volumes are in octets above the GTP-U layer and are separated for uplink and downlink traffic.</p>
		 <b>Important:</b> Only one LOTV container per eG-CDR.
Record Opening Time	M	Time stamp when this record was opened.
Duration	M	Duration of this record in the GGSN.
Cause for Record Closing	M	The reason for the release of record from this GGSN.
Diagnostics	O	A more detailed reason for the release of the connection.
Record Sequence Number	C	Partial record sequence number, only present in case of partial records.
Node ID	O	Name of the recording entity.
Record Extensions	O	A set of network/manufacturer specific extensions to the record.
Local Record Sequence Number	O	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
Charging Characteristics	C	The Charging Characteristics flag retrieved from subscriber's data as described in TS 32.015 sub clause 6.1.6.5.

Notes:

- Only Single LOTV container is supported.
- Data Record Format Version IE contains 0x1307 instead of 0x1308.
- QoSRequested is not present in the LoTV containers.
- QoSNegotiated is added only for first container and container after QoSChange condition.
- Single LOTV container is supported.
- Supports R99 QoS only.

## custom5 and custom9 Dictionaries

eG-CDR fields for TS 32.298 v 6.5.0 (R6) (with customer specific changes).

Field	Category	Description
Record Type	M	GGSN PDP context record (EGSNPDPRECORD).
Network Initiated PDP Context	O <sub>c</sub>	A flag that is present if this is a network-initiated PDP context.
Served IMSI	M	IMSI of the served party.
Served IMEISV	O <sub>c</sub>	IMEISV of the ME, if available.
GGSN Address	M	The control plane IP address of the GGSN used.
Charging ID	M	PDP context identifier used to identify this PDP context in different records created by GSNs.
SGSN Address	M	List of SGSN addresses used during this record.
Access Point Name Network Identifier	O <sub>M</sub>	The logical name of the connected access point to the external packet data network (network identifier part of APN).
PDP Type	O <sub>M</sub>	PDP type, i.e. IP, PPP, or IHOSS:OSP.
Served PDP Address	O <sub>c</sub>	PDP address, i.e. IPv4 or IPv6. This parameter shall be present except when both the PDP type is PPP and dynamic PDP address assignment is used.
Dynamic Address Flag	O <sub>c</sub>	Indicates whether served PDP address is dynamic, which is allocated during PDP context activation. This field is missing if address is static.
List of Traffic Data Volumes	O <sub>M</sub>	A list of changes in charging conditions for this PDP context, each change is time stamped. Charging conditions are used to categorize traffic volumes, such as per tariff period. Initial and subsequently changed QoS and corresponding data values are also listed.
Record Opening Time	M	Time stamp when PDP context is activated in this GGSN or record opening time on subsequent partial records.

MS Time Zone	O <sub>c</sub>	This field contains the MS Time Zone the MS is currently located as defined in TS 29.060, if provided by SGSN.
Duration	M	Duration of this record in the GGSN.
Cause for Record Closing	M	The reason for the release of record from this GGSN.
Record Sequence Number	C	Partial record sequence number, only present in case of partial records.
Node ID	O <sub>M</sub>	Name of the recording entity.
Local Record Sequence Number	O <sub>M</sub>	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
APN Selection Mode	O <sub>M</sub>	An index indicating how the APN was selected.
Served MSISDN	O <sub>M</sub>	The primary MSISDN of the subscriber.
User Location Information	O <sub>c</sub>	This field contains the User Location Information of the MS as defined in TS 29.060, if provided by SGSN.
Charging Characteristics	M	The Charging Characteristics applied to the PDP context.
Charging Characteristics Selection Mode	O <sub>M</sub>	Holds information about how Charging Characteristics were selected.
SGSN PLMN Identifier	O <sub>M</sub>	SGSN PLMN Identifier (MCC and MNC) used during this record.
RAT Type	O <sub>c</sub>	This field indicates the Radio Access Technology (RAT) type currently used by the Mobile Station as defined in TS 29.060. The field is present in the G-CDR if provided by SGSN.
List of Service Data Volumes	O <sub>c</sub>	A list of the changes that occurred in charging conditions for all service data flows for the PDP context.

Notes:

- A maximum of eight LOTV containers and 10 LOSDV containers supported per eG-CDR.
- QoSRequested is not present in the LoTV containers.
- QoSNegotiated is added only for first container and container after QoSChange condition.
- Failure handling continue included in LOTV container.

## ■ CDR Fields Supported in eG-CDRs

- Service Identifier \*NOT\* included in LOSDV.
- Service change condition is encoded as 32 bits.

**List of Traffic Data Volumes**

<b>List of Traffic Data Volumes</b>		
QoS Requested (not in G-CDR)	N/A	
QoS Negotiated	O	QoS Negotiated indicates the applied QoS accepted by the network.
Data Volume Uplink	M	Number of octets in uplink direction.
Data Volume Downlink	M	Number of octets in downlink direction.
Change Condition	M	The change condition that resulted in this LOTV container.
Change Time	M	Timestamp at change.
Failurehandling Continue (only in e-GCDRs)	O	Boolean indicating offline charging enabled.

**List of Service Data Volumes**

<b>List of Service Data Volumes</b>		
Rating group	M	This is the service flow identity and has to be used for differentiated evaluation of user's traffic. Also known as content-id.
Charging Rulebase name	M	The name of the Rulebase used for charging. This is the group name of charging rules.
Result Code	O	The result code AVP. This contains the result code after the interconnection with the CRF.

Local Sequence number	M	A per service data container sequence number. It starts from 1 for each service, increasing by 1 for each service data container generated for that service within the lifetime of this PDP session.
Time of first usage	M	The time stamp for the first IP packet to be transmitted for the service data flow referred to the current instance of Service Condition Change.
Time of last usage	M	The time stamp for the last IP packet to be transmitted for the service data flow referred to the current instance of Service Condition Change.
Usage time	M	The difference between “time of first usage” and “time of last usage”.
Service condition change	M	The reason for closing the service data container for triggers like SGSN change, QoS change, RAT change, time and volume triggers, etc.
QoS negotiated	O	The negotiated QoS applied for the service data flow.
sgsn-Address	M	The valid SGSN IP address during the service data recording interval.
SGSN PLMN identifier	O	The valid SGSN PLMN ID during the service data recording interval.
FBC Data volume uplink	M	The number of octets transmitted during the use of the packet data services in the uplink direction.
FBC data volume downlink	M	The number of octets transmitted during the use of the packet data services in the downlink direction.
Time of report	M	A time stamp defining the moment when the service data container is closed.
RAT Type	O	The valid radio access technology type during the service data recording interval.
Failurehandling Continue (only in e-GCDRs)	O	A Boolean expression included if the failure handling condition has been executed.

## custom6 – custom8, custom14, custom15, custom17, custom20 Dictionaries

eG-CDR fields for TS 32.298 v 6.5.0 (R6).

Field	Category	Description
Record Type	M	GGSN PDP context record (EGSNPDPRECORD).
Network initiated PDP context	O <sub>c</sub>	A flag that is present if this is a network-initiated PDP context.
Served IMSI	M	IMSI of the served party.
Served IMEISV	O <sub>c</sub>	IMEISV of the ME, if available.
GGSN Address	M	The control plane IP address of the GGSN used.
Charging ID	M	PDP context identifier used to identify this PDP context in different records created by GSNs.
SGSN Address	M	List of SGSN addresses used during this record.
Access Point Name Network Identifier	O <sub>M</sub>	The logical name of the connected access point to the external packet data network (network identifier part of APN).
PDP Type	O <sub>M</sub>	PDP type, i.e. IP, PPP, or IHOSS:OSP.
Served PDP Address	O <sub>c</sub>	PDP address, i.e. IPv4 or IPv6. This parameter shall be present except when both the PDP type is PPP and dynamic PDP address assignment is used.
Dynamic Address Flag	O <sub>c</sub>	Indicates whether served PDP address is dynamic, which is allocated during PDP context activation. This field is missing if address is static.
List of Traffic Data Volumes	O <sub>M</sub>	A list of changes in charging conditions for this PDP context, each change is time stamped. Charging conditions are used to categorize traffic volumes, such as per tariff period. Initial and subsequently changed QoS and corresponding data values are also listed.
Record Opening Time	M	Time stamp when PDP context is activated in this GGSN or record opening time on subsequent partial records.

MS Time Zone	O <sub>c</sub>	This field contains the MS Time Zone the MS is currently located as defined in TS 29.060, if provided by SGSN.
Duration	M	Duration of this record in the GGSN.
Cause for Record Closing	M	The reason for the release of record from this GGSN.
Record Sequence Number	C	Partial record sequence number, only present in case of partial records.
Node ID	O <sub>M</sub>	Name of the recording entity.
Local Record Sequence Number	O <sub>M</sub>	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
APN Selection Mode	O <sub>M</sub>	An index indicating how the APN was selected.
Served MSISDN	O <sub>M</sub>	The primary MSISDN of the subscriber.
User Location Information	O <sub>c</sub>	This field contains the User Location Information of the MS as defined in TS 29.060, if provided by SGSN.
Charging Characteristics	M	The Charging Characteristics applied to the PDP context.
Charging Characteristics Selection Mode	O <sub>M</sub>	Holds information about how Charging Characteristics were selected.
SGSN PLMN Identifier	O <sub>M</sub>	SGSN PLMN Identifier (MCC and MNC) used during this record.
RAT Type	O <sub>c</sub>	This field indicates the Radio Access Technology (RAT) type currently used by the Mobile Station as defined in TS 29.060. The field is present in the G-CDR if provided by SGSN.
List of Service Data Volumes	O <sub>c</sub>	A list of the changes that occurred in charging conditions for all service data flows for the PDP context

Notes:

- A maximum of eight LOTV containers and 10 LOSDV containers supported per eG-CDR.
- QoSRequested is not present in the LoTV containers.
- QoSNegotiated is added only for first container and container after QoSChange condition.
- Failure handling continue included in LOTV container.

## ■ CDR Fields Supported in eG-CDRs

- Service change condition is encoded as 21 bits (with 3 bits padding — 24 bits for 8 bit boundary).
- Service-identifier level support available (Service Identifier will be included in LOSDV container if configured in corresponding charging-action).
- custom7, custom15, and custom17 dictionaries: Same as custom6 GTPP dictionary.
- custom8 dictionary: Same as custom6 and custom7 GTPP dictionaries except that the beginning of the eG-CDR is encoded as “0xbc” (binary - 10111100 which is 28) instead of “0xb5” (binary - 10110101 which is 21). The last 5 bits here identify the record type which is tag value of 28 for EGSNPDPRecord.
- custom14 dictionary: Same as custom6 GTPP dictionary with TEXT represented IP addresses.
- custom20 dictionary:
  - CallEventRecordChoiceID value changed to 28 as per customer requirement.
  - ChargingRuleBaseName not included in LOSDV container.
  - Suppression of IE “networkInitiation” in EGSNPDPRECORD.
  - Suppression of IE “diagnostics” attribute in EGSNPDPRECORD.
  - Suppression of IE “failureHandlingContinue” from LOTV. (If Failure handling takes place, changeCondition in LOTV will be Failure Handling Continue.)
  - “managementIntervention” IE value of 20 changed to 100 as per customer requirement.
  - “pLMNChange” IE for CauseForRecClosing handled separately with a value of 101.

## List of Traffic Data Volumes

List of Traffic Data Volumes		
QoS Requested (not in G-CDR)	N/A	
QoS Negotiated	O	QoS Negotiated indicates the applied QoS accepted by the network.
Data Volume Uplink	M	Number of octets in uplink direction.
Data Volume Downlink	M	Number of octets in downlink direction.
Change Condition	M	The change condition that resulted in this LOTV container.
Change Time	M	Timestamp at change.
Failurehandling Continue (only in e-GCDRs)	O	Boolean indicating offline charging enabled.

## List of Service Data Volumes

List of Service Data Volumes		
Rating group	M	This is the service flow identity and has to be used for differentiated evaluation of user's traffic. Also known as content-id.
Charging Rulebase name	M	The name of the Rulebase used for charging. This is the group name of charging rules.
Result Code	O	The result code AVP. This contains the result code after the interconnection with the CRF.
Local Sequence number	M	A per service data container sequence number. It starts from 1 for each service, increasing by 1 for each service data container generated for that service within the lifetime of this PDP session.
Time of first usage	M	The time stamp for the first IP packet to be transmitted for the service data flow referred to the current instance of Service Condition Change.
Time of last usage	M	The time stamp for the last IP packet to be transmitted for the service data flow referred to the current instance of Service Condition Change.
Usage time	M	The difference between "time of first usage" and "time of last usage".
Service condition change	M	The reason for closing the service data container for triggers like SGSN change, QoS change, RAT change, time and volume triggers, etc.
QoS negotiated	O	The negotiated QoS applied for the service data flow.
sgsn-Address	M	The valid SGSN IP address during the service data recording interval.
SGSN PLMN identifier	O	The valid SGSN PLMN ID during the service data recording interval.
FBC Data volume uplink	M	The number of octets transmitted during the use of the packet data services in the uplink direction.

## ■ CDR Fields Supported in eG-CDRs

FBC data volume downlink	M	The number of octets transmitted during the use of the packet data services in the downlink direction.
Time of report	M	A time stamp defining the moment when the service data container is closed.
RAT Type	O	The valid RAT type during the service data recording interval.
Failurehandling Continue	O	A Boolean expression included if the failure handling condition has been executed.
Service Identifier	O	The service identifier may designate an end user service, a part of an end user service or an arbitrarily formed group thereof.

## standard and custom10 Dictionaries

eG-CDR fields for TS 32.215 v 4.6.0 (R4).

Field	Category	Description
Record Type	M	GPRS GGSN PDP context record.
Network initiated PDP context	C	Present if this is a network-initiated PDP context.
Served IMSI	M	IMSI of the served party (if Anonymous Access Indicator is FALSE or not supplied).
Served MSISDN	O	The primary MSISDN of the subscriber.
GGSN Address	M	The IP address of the GGSN used.
Charging ID	M	PDP context identifier used to identify this PDP context in different records created by GSNs.
SGSN Address	M	List of SGSN addresses used during this record.
Access Point Name Network Identifier	M	The logical name of the connected access point to the external packet data network (network identifier part of APN).
APN Selection Mode	O	An index indicating how the APN was selected.

PDP Type	M	PDP type, i.e. IP, PPP, or IHOSS:OSP.
Served PDP Address	M	PDP address, i.e. IPv4 or IPv6 address.
Dynamic Address Flag	C	Indicates whether served PDP address is dynamic, which is allocated during PDP context activation.
List of Traffic Data Volumes	M	<p>A list of changes in charging conditions for this PDP context, each time stamped. Charging conditions are used to categorize traffic volumes, such as per tariff period. Initial and subsequently changed QoS and corresponding data values are listed.</p> <p>In GSM, data volumes are in octets above the GTP layer and are separated for uplink and downlink traffic.</p> <p>In 3G, data volumes are in octets above the GTP-U layer and are separated for uplink and downlink traffic.</p> <p style="text-align: center;"><u>Only one LOTV container per eG-CDR.</u></p>
Record Opening Time	M	Time stamp when this record was opened.
Duration	M	Duration of this record in the GGSN.
Cause for Record Closing	M	The reason for the release of record from this GGSN.
Record Sequence Number	C	Partial record sequence number, only present in case of partial records.
Node ID	O	Name of the recording entity.
Local Record Sequence Number	O	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
Charging Characteristics	C	The Charging Characteristics flag retrieved from subscriber's data as described in TS 32.015 sub clause 6.1.6.5.

## custom12 and custom19 Dictionaries

eG-CDR fields for TS 32.298 v7.4.0 (R7).

Field	Category	Description
Record Type	M	GGSN PDP context record (EGSNPDPRECORD)

## ■ CDR Fields Supported in eG-CDRs

Network initiated PDP context	O <sub>c</sub>	A flag that is present if this is a network-initiated PDP context.
Served IMSI	M	IMSI of the served party.
GGSN Address	M	The control plane IP address of the GGSN used.
Charging ID	M	PDP context identifier used to identify this PDP context in different records created by GSNs.
SGSN Address	M	List of SGSN addresses used during this record.
Access Point Name Network Identifier	O <sub>M</sub>	The logical name of the connected access point to the external packet data network (network identifier part of APN).
PDP Type	O <sub>M</sub>	PDP type, i.e. IP, PPP, or IHOSS:OSP.
Served PDP Address	O <sub>c</sub>	PDP address, i.e. IPv4 or IPv6. This parameter shall be present except when both the PDP type is PPP and dynamic PDP address assignment is used.
Dynamic Address Flag	O <sub>c</sub>	Indicates whether served PDP address is dynamic, which is allocated during PDP context activation. This field is missing if address is static.
List of Traffic Data Volumes	O <sub>M</sub>	A list of changes in charging conditions for this PDP context, each change is time stamped. Charging conditions are used to categorize traffic volumes, such as per tariff period. Initial and subsequently changed QoS and corresponding data values are also listed.
Record Opening Time	M	Time stamp when PDP context is activated in this GGSN or record opening time on subsequent partial records.
Duration	M	Duration of this record in the GGSN.
Cause for Record Closing	M	The reason for the release of record from this GGSN.
Diagnostics	O	A more detailed reason for the release of the connection.
Record Sequence Number	C	Partial record sequence number, only present in case of partial records.
Node ID	O <sub>M</sub>	Name of the recording entity.
Record Extensions	O	A set of network operator specific extensions to the record.

Local Record Sequence Number	O <sub>M</sub>	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
APN Selection Mode	O <sub>M</sub>	An index indicating how the APN was selected.
Served MSISDN	O <sub>M</sub>	The primary MSISDN of the subscriber.
Charging Characteristics	M	The Charging Characteristics applied to the PDP context.
Charging Characteristics Selection Mode	O <sub>M</sub>	Holds information about how Charging Characteristics were selected.
SGSN PLMN Identifier	O <sub>M</sub>	SGSN PLMN Identifier (MCC and MNC) used during this record.
Served IMEISV	O <sub>C</sub>	IMEISV of the ME, if available.
RAT Type	O <sub>C</sub>	This field indicates the Radio Access Technology (RAT) type currently used by the Mobile Station as defined in TS 29.060. The field is present in the G-CDR if provided by SGSN.
MS Time Zone	O <sub>C</sub>	This field contains the MS Time Zone the MS is currently located as defined in TS 29.060, if provided by SGSN.
User Location Information	O <sub>C</sub>	This field contains the User Location Information of the MS as defined in TS 29.060, if provided by SGSN.
List of Service Data Volumes	O <sub>C</sub>	A list of the changes that occurred in charging conditions for all service data flows for the PDP context.

## List of Traffic Data Volumes

List of Traffic Data Volumes		
QoS Requested (not in G-CDR)	N/A	
QoS Negotiated	O	QoS Negotiated indicates the applied QoS accepted by the network.
Data Volume Uplink	M	Number of octets in uplink direction.

## ■ CDR Fields Supported in eG-CDRs

Data Volume Downlink	M	Number of octets in downlink direction.
Change Condition	M	The change condition that resulted in this LOTV container.
Change Time	M	Timestamp at change.
Failurehandling Continue (only in e-GCDRs)	O	Boolean indicating offline charging enabled.
UserLocationInformation	O	This field contains the User Location Information of the MS.

Notes:

- LOTV related changes:
  - A new IE is included for LOTV container i.e. User location information.
  - The list of traffic data volumes now supports RAI and CGI/SAI changes, i.e. whenever RAI and/or CGI/SAI changes are detected; it will result in a “List of Traffic Data Volumes” container being added to the CDR, if location reporting is required and a report of CGI/SAI change is received.

## List of Service Data Volumes

List of Service Data Volumes		
Rating group	M	This is the service flow identity and has to be used for differentiated evaluation of user's traffic. Also known as content-id.
Charging Rulebase name	M	The name of the Rulebase used for charging This is the group name of charging rules.
Result Code	O	The result code AVP This contains the result code after the interconnection with the CRF.
Local Sequence number	M	A per service data container sequence number. It starts from 1 for each service, increasing by 1 for each service data container generated for that service within the lifetime of this PDP session.
Time of first usage	M	The time stamp for the first IP packet to be transmitted for the service data flow referred to the current instance of Service Condition Change.

Time of last usage	M	The time stamp for the last IP packet to be transmitted for the service data flow referred to the current instance of Service Condition Change.
Usage time	M	The difference between “time of first usage” and “time of last usage”.
Service condition change	M	The reason for closing the service data container for triggers like SGSN change, QoS change, RAT change, time and volume triggers, etc.
QoS negotiated	O	The negotiated QoS applied for the service data flow.
sgsn-Address	M	The valid SGSN IP address during the service data recording interval.
SGSN PLMN identifier	O	The valid SGSN PLMN ID during the service data recording interval.
FBC Data volume uplink	M	The number of octets transmitted during the use of the packet data services in the uplink direction.
FBC data volume downlink	M	The number of octets transmitted during the use of the packet data services in the downlink direction.
Time of report	M	A time stamp defining the moment when the service data container is closed.
RAT Type	O	The valid RAT type during the service data recording interval.
Failurehandling Continue	O	A Boolean expression included if the failure handling condition has been executed.
Service Identifier	O	The service identifier may designate an end user service, a part of an end user service or an arbitrarily formed group thereof.

Notes:

LOSDV related changes:

- Time Quota mechanism: Contains two further subfields and is included if envelope reporting is required:
  - Time Quota Type identifies the mechanism by which time-based usage should be reported — as defined in TS 32.299.
  - Base Time Interval identifies the length of the base time interval, for controlling the reporting of time-based usage, in seconds.

## ■ CDR Fields Supported in eG-CDRs

- User location information will be included in the LOSDV container in the R7 eG-CDRs.
- The “Service Change Condition” cause changes are as follows:
  - Time limit eG-CDRs where the corresponding service change condition now has been changed to “Time Limit”. Earlier there was no specific service change condition and instead “Time Exhausted” was used.
  - Volume limit eG-CDRs where the corresponding service change condition now has been changed to “Volume Limit”. Earlier there was no specific service change condition and instead “Volume Exhausted” was used.
  - eG-CDRs that are generated as a result of MS-TimeZone change will have service change condition as “Record closure”.
- custom12 and custom19 dictionaries have Rel. 7 related changes. However, custom12 also contains few customer-specific items that are not part of plain Rel. 7 features. For example, dataVolumeTotal field in LOSDV container.

## custom21 Dictionary

eG-CDR fields for TS 32.215 v 4.5.0 (R4).

Field	Category	Description
Record Type	M	GPRS GGSN PDP context record.
Network initiated PDP context	C	Present if this is a network-initiated PDP context.
Served IMSI	M	IMSI of the served party (if Anonymous Access Indicator is FALSE or not supplied).
GGSN Address	M	The IP address of the GGSN used.
Charging ID	M	PDP context identifier used to identify this PDP context in different records created by GSNs.
SGSN Address	M	List of SGSN addresses used during this record.
Access Point Name Network Identifier	M	The logical name of the connected access point to the external packet data network (network identifier part of APN).
PDP Type	M	PDP type, i.e. IP, PPP, or IHOSS:OSP.
Served PDP Address	M	PDP address, i.e. IPv4 or IPv6 address.

Dynamic Address Flag	C	Indicates whether served PDP address is dynamic, which is allocated during PDP context activation.
List of Traffic Data Volumes	M	A list of changes in charging conditions for this PDP context, each time stamped. Charging conditions are used to categorize traffic volumes, such as per tariff period. Initial and subsequently changed QoS and corresponding data values are listed. In GSM, data volumes are in octets above the GTP layer and are separated for uplink and downlink traffic. In 3G, data volumes are in octets above the GTP-U layer and are separated for uplink and downlink traffic.
Record Opening Time	M	Time stamp when this record was opened.
Duration	M	Duration of this record in the GGSN.
Cause for Record Closing	M	The reason for the release of record from this GGSN.
Diagnostics	M	A more detailed reason for the release of the connection.
Record Sequence Number	C	Partial record sequence number, only present in case of partial records.
Node ID	O	Name of the recording entity.
Record Extensions	O	A set of network operator specific extensions to the record.
Local Record Sequence Number	O	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
APN Selection Mode	O	An index indicating how the APN was selected.
Served MSISDN	O	The primary MSISDN of the subscriber.
Charging Characteristics	C	The Charging Characteristics flag retrieved from subscriber's data.
Charging Characteristics Selection mode	O	Holds information about how Charging Characteristics were selected.
SGSN PLMN Identifier	O <sub>M</sub>	SGSN PLMN Identifier (MCC and MNC) used during this record.

Notes:

- custom21 GTPP dictionary contains customer-specific changes. Including:

## ■ CDR Fields Supported in eG-CDRs

- Support for Multiple LOTV containers.
- Support for SGSN address list overflow.
- Support for 10 digit service code.

## custom27 Dictionary

S-CDR fields based on 3GPP TS 32.298 V6.6.0 (2006-12) (R6).

Field	Category	Description
sgsnPDPRecord	M	Record field contains the items that may be present in an S-CDR.
Record Type	M	SGSN/GGSN PDP context record.
Served IMSI	M	IMSI of the served party.
Served IMEI	O <sub>c</sub>	IMEI of the ME, if available in the SGSN.
SGSN Address	M	The control plane IP address of the SGSN used.
MS Network Capability	O <sub>c</sub>	MS network capability value of the MS network capability information element of the served MS on PDP context activation
Routing Area	O <sub>c</sub>	Contains the RA code of the area where the MS is located when the (partial) record is opened.
Location Area Code	O <sub>c</sub>	Contains the Location Area Code of the area where the MS is located when the (partial) record is opened.
Cell Identifier	O <sub>c</sub>	Contains the CI (GSM) or the SAC (WCDMA) of the cell where the MS is located when the S-CDR is opened. The first partial or single S-CDR reports the current cell identifier at PDP context activation. For any subsequent partial S-CDRs, the accuracy of the reported cell identifier is limited to the cell identifier for the last RA update reported by the MS.
Charging ID	M	PDP context identifier used to identify this PDP context in different records created by GSNs.
GGSN Address	M	List of GGSN addresses used during this record.

Access Point Name Network Identifier	O <sub>M</sub>	The logical name of the connected access point to the external packet data network (network identifier part of APN).
PDP Type	O <sub>M</sub>	PDP type, i.e. IP, PPP, or IHOSS:OSP.
Served PDP Address	O <sub>C</sub>	PDP address, i.e. IPv4 or IPv6 address. This parameter shall be present except when both the PDP type is PPP and dynamic PDP address assignment is used.
List of Traffic Data Volumes	O <sub>C</sub>	A list of changes in charging conditions for this PDP context, each time stamped. Charging conditions are used to categorize traffic volumes, such as per tariff period. Initial and subsequently changed QoS and corresponding data values are also listed.
Record Opening Time	M	Time stamp when PDP context is activated in this GGSN or record opening time on subsequent partial records.
Duration	M	Duration of this record in the GGSN.
SGSN Change	O <sub>C</sub>	Indicate that this is the first record after an inter-SGSN routing area update in new SGSN and an intra-SGSN inter-system change.
Cause for Record Closing	M	The reason for the release of record from this SGSN.
Diagnostics	O <sub>M</sub>	A more detailed reason for the release of the connection.
Record Sequence Number	C	Partial record sequence number, only present in case of partial records.
Node ID	O <sub>M</sub>	Name of the recording entity.
Local Record Sequence Number	O <sub>M</sub>	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
APN Selection Mode Index	O <sub>M</sub>	Defines in which PLMN GPRS backbone the GGSN is located. The last label must be "gprs". The first and second labels together uniquely identify the GPRS PLMN.
Served MSISDN	O <sub>M</sub>	The primary MSISDN of the subscriber.
Charging Characteristics	M	The Charging Characteristics flag retrieved from subscriber's data as described in TS 32.015 sub clause 6.1.6.5.

## ■ CDR Fields Supported in eG-CDRs

System Type	O <sub>c</sub>	Indicates the use of a 3G air interface for the provisioning of service recorded by this CDR. In case service is provided by a GSM air interface, the field is not present.
CAMEL Information	O <sub>c</sub>	Set of CAMEL information related to PDP context. This field is present if CAMEL Charging Information is received by the GGSN in the GTP Create PDP context request.
Charging Characteristics Selection Mode	O <sub>M</sub>	Holds information about how Charging Characteristics were selected.
Dynamic Address Flag	O <sub>c</sub>	Indicates whether served PDP address is dynamic, which is allocated during PDP context activation.
PLMN Identifier	O <sub>M</sub>	Indicates the PLMN Identifier (MCC and MNC) used during this record.

Notes:

- QoSRequested is not present in the LoTV containers.
- QoSNegotiated is added only for first container and container after QoSChange condition.

## custom 30 Dictionary

Enhanced G-CDR fields based on 3GPP TS 32.298 V6.4.1 (2006-12) (R6).

Field	Category	Description
Record Type	M	GPRS GGSN PDP context record.
Served IMSI	M	IMSI of the served party (if Anonymous Access Indicator is FALSE or not supplied).
GGSN Address	M	The IP address of the GGSN used.
Charging ID	M	PDP context identifier used to identify this PDP context in different records created by GSNs.
SGSN Address	M	List of SGSN addresses used during this record.

Access Point Name Network Identifier	M	The logical name of the connected access point to the external packet data network (network identifier part of APN).
PDP Type	M	PDP type, i.e. IP, PPP, or IHOSS:OSP
Served PDP Address	M	PDP address, i.e. IPv4 or IPv6 address.
Dynamic Address Flag	C	Indicates whether served PDP address is dynamic, which is allocated during PDP context activation.
List of Traffic Data Volumes	M	A list of changes in charging conditions for this PDP context, each time stamped. Charging conditions are used to categorize traffic volumes, such as per tariff period. Initial and subsequently changed QoS and corresponding data values are also listed. In GSM, data volumes are in octets above the GTP layer and are separated for uplink and downlink traffic. In 3G, data volumes are in octets above the GTP-U layer and are separated for uplink and downlink traffic.
Record Opening Time	M	Time stamp when this record was opened.
Duration	M	Duration of this record in the GGSN.
Cause for Record Closing	M	The reason for the release of record from this GGSN.
Record Sequence Number	C	Partial record sequence number, only present in case of partial records.
Node ID	O	Name of the recording entity.
Local Record Sequence Number	O	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
APN Selection Mode	O	An index indicating how the APN was selected.
Served MSISDN	O	The primary MSISDN of the subscriber.
Charging Characteristics	M	The Charging Characteristics flag retrieved from subscriber's data as described in TS 32.015 sub clause 6.1.6.5.
Charging Characteristics Selection Mode	O	Holds information about how Charging Characteristics were selected.
SGSN PLMN Identifier	O	SGSN PLMN Identifier (MCC and MNC) used during this record.

## ■ CDR Fields Supported in eG-CDRs

Served IMEISV	O	IMEISV of the ME, if available.
RAT Type	O	This field indicates the Radio Access Technology (RAT) type currently used by the Mobile Station as defined in TS 29.060. The field is present in the G-CDR if provided by SGSN.
MS Time Zone	O	This field contains the MS Time Zone the MS is currently located as defined in TS 29.060, if provided by SGSN.
User Location Information	O	This field contains the User Location Information of the MS as defined in TS 29.060, if provided by SGSN.
List of Service Data Volumes	O	A list of the changes that occurred in charging conditions for all service data flows for the PDP context.

Notes:

- “Record Extensions” is not present in this version.
- “External Charging Identifier” is not present in this version.
- “CAMEL Information” is not present in this version.

## custom 33 Dictionary

Enhanced G-CDR fields based on 3GPP TS 32.298 V6.5.0 (R6).

Field	Category	Description
Record Type	M	This field identifies the type of the record.
Network initiated PDP context	O	This field indicates that the PDP context was network initiated. The field is missing in case of mobile activated PDP context. Set to TRUE (0xFF) if PDP context was initiated from network side.
Served IMSI	M	This field contains IMSI of the served party (if Anonymous Access Indicator is FALSE or not supplied).

GGSN Address	M	This field provides the current serving GGSN IP address for the Control Plane. The standard 32.298 offers a choice for the encoding of the address to be either in binary or text format. The GGSN encodes the address in binary format. Indefinite length encoding is used for this field.
Charging ID	M	This field is a charging identifier, which can be used together with the GGSN address to identify all records produced in the GGSN involved in a single PDP context. The Charging ID is generated by the GGSN at PDP context activation and is transferred to the context requesting SGSN. At an inter-SGSN routing area update the charging ID is transferred to the new SGSN as part of each active PDP context.
List of SGSN Addresses	M	List of SGSN addresses used during this record. This field contains 1–5 SGSN IP addresses (max. 4 SGSN changes). A CDR is closed as a partial with Cause for Record Closing set to SGSN Change when the maximum number of changes has been recorded. Subsequent SGSN changes will be listed in the next partial. Indefinite length encoding is used for this field.
Access Point Name Network Identifier	M	This field contain the Network Identifier part of the Access Point Name (APN). It is provided by the SGSN in the Create PDP Context Request message. In case of a configured virtual APN, the virtual APN is included instead, unless this is overridden by the CLI command “ <b>g cdr apn-name-to-be-included {gn   virtual}</b> ”
PDP Type	M	This field identifies the PDP type, i.e. IP, PPP, or IHOSS:OSP
Served PDP Address	O	This field contains the PDP address of the served IMSI, for which the standard 3GPP TS 32.298 allows a choice of either IP address or ETSIAddress. Indefinite length encoding is used for this field.
Dynamic Address Flag	O	This field indicates that the PDP address has been dynamically allocated for that particular PDP context. This field is missing if address is static i.e. part of PDP context subscription.
Record Opening Time	M	This field contains the time stamp when PDP context is activated in GGSN or when a subsequent record is opened after a partial record.

## ■ CDR Fields Supported in eG-CDRs

Duration	M	This field contains the relevant duration in seconds for PDP contexts with range of 0...4294967295 (2^32-1). It is the duration from Record Opening Time to record closure. For partial records this is the duration of the individual partial record and not the cumulative duration.
Cause for Record Closing	M	This field contains a reason for the release of record from this GGSN.
Record Sequence Number	O	This field contains a running sequence number with range 1...4294967295 used to link partial records generated by the GGSN for a specific PDP context (characterized with the same Charging ID and GGSN address pair). This field is always present in this case.
Node ID	M	This field contains an identifier string for the node that had generated the CDR.
Local Record Sequence Number	M	For each Node ID, this number with range 1...4294967295 is allocated sequentially for each CDR. This along with a Node ID uniquely identifies a CDR.
APN Selection Mode	M	An index indicating how the APN was selected.
Served MSISDN	M	The field tracks the Mobile Station (MS) ISDN number (MSISDN) of the subscriber which is a part of Create PDP Context Request message.
Charging Characteristics	M	Lists the charging characteristics applied to the PDP context. The GGSN can accept charging characteristics from the SGSN or AAA or use its own configured value. GGSN configured charging characteristics are specified as part of the GGSN Service and are applied for G-CDRs to subscriber PDP contexts through APN templates.
Charging Characteristics Selection Mode	O	The charging characteristic type that the GGSN applied to the CDR.
SGSN PLMN Identifier	O	RAI (optionally supplied by SGSN in the GTP create PDP context request) is used as SGSN PLMN Identifier value. It is omitted if the SGSN does not supply the RAI and is not identified as a “home” SGSN. For home SGSNs without the RAI a locally configured PLMN-ID can be sent instead.
Served IMEISV	O	The International Mobile Equipment Identity and Software Version Number (IMEISV) of the MS, if available.

RAT Type	O	This field indicates the Radio Access Technology (RAT) type currently used by the Mobile Station as defined in TS 29.060. The field is present in the CDR if provided by SGSN.
MS Time Zone	O	The “Time Zone” IE that the SGSN may provide to the GGSN during the PDP context activation/modification procedure.
User Location Information	O	The User Location Information for the MS if provided by the SGSN to the GGSN during the PDP context activation/modification procedure. Transparently copied from the PDP context request
List of Service Data Volumes	O	A list of the changes that occurred in charging conditions for all service data flows for the PDP context. Indefinite length encoding is used for this field.

Notes:

- For custom33 dictionary, eG-CDR will always have LOSDV even if no data has been passed for the entire life time of the call.

## List of Service Data Volumes

List of Service Data Volumes		
Service Data Volume Block	O	A list of the changes that occurred in charging conditions for all service data flows for the PDP context. Indefinite length encoding is used for this field.
Rating group	M	This is the service flow identity and has to be used for differentiated evaluation of user's traffic. Also known as content-id. Default: 403
Result Code	O	The result code AVP contains the result code after the interconnection with the Diameter server. The diameter server sends result-codes for each of the content-id for which quota is requested. The GGSN use this to populate the eG-CDR bucket. This is a mandatory AVP that comes in response for every quota request for a category. Default: 0

## ■ CDR Fields Supported in eG-CDRs

Local Sequence number	M	A per service data container sequence number. It starts from 1 for each service, increasing by 1 for each service data container generated for that service within the lifetime of this PDP session. Default: Same as "localRecordSequenceNumber" field of main CDR.
Time of first usage	M	The time stamp for the first IP packet to be transmitted for the service data flow referred to the current instance of Service Condition Change. Default: Same as "Record Opening Time" field of main CDR.
Time of last usage	M	The time stamp for the last IP packet to be transmitted for the service data flow referred to the current instance of Service Condition Change. Default: Same as "Record Opening Time" field of main CDR.
Usage time	M	The difference, in seconds with range 0...4294967295, between "time of first usage" and "time of last usage". Default: 0
Service condition change	M	The reason for closing the service data container for triggers like SGSN change, QoS change, RAT change, time and volume triggers, etc. Default: Value 4 to be encoded as per 3GPP format. 4 denotes "PDPContextRelease" or normal termination.
QoS negotiated	O	The negotiated QoS applied for the service data flow. Default: Negotiated QoS for the PDP context.
sgsn-Address	M	The valid SGSN IP address during the service data recording interval. Default: Same as "sgsn-address" field of main CDR.
SGSN PLMN identifier	O	RAI (optionally supplied by SGSN in the GTP create PDP context request) is used as SGSN PLMN Identifier value. It is omitted if the SGSN does not supply the RAI and is not identified as a "home" SGSN. For home SGSNs without the RAI a locally configured PLMN-ID can be sent instead. Default: Same as "sgsnPLMNIIdentifier" field of main CDR.
FBC Data volume uplink	M	The number of octets transmitted during the use of the packet data services in the uplink direction. Default: 0
FBC data volume downlink	M	The number of octets transmitted during the use of the packet data services in the downlink direction. Default: 0

Time of report	M	A time stamp defining the moment when the service data container is closed. Default: Same as "Record Opening Time" field of main CDR.
RAT Type	O	The valid RAT type during the service data recording interval. Default: Same as "RAT Type" field of main CDR.
Failurehandling Continue	O	A Boolean expression included if the failure handling condition has been executed. This can be either configured on the GGSN using the <b>failure-handling</b> CLI command in the <b>credit-control</b> mode or can be received from the server in the <b>Credit-Control-Failure-Handling</b> AVP. Whichever is received from the server will have higher precedence. There is no negotiation with the Diameter server in this regard and the GGSN will use whatever the server provides.
Service Identifier	O	The service identifier may designate an end user service, a part of an end user service or an arbitrarily formed group thereof. Content-id and service-id are used as unique key to identify FBC Bucket.



# Chapter 9

## G-CDR and Enhanced G-CDR Field Descriptions

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This chapter lists and describes the fields supported by the system for use in GGSN charging data records (G-CDRs) and enhanced G-CDRs (eG-CDRs).

The following information is provided for each field:

- **Description:** The field's description.
- **Format:** The field's data format.
- **Length:** The field's size, in bytes.

All G-CDRs and eG-CDRs are encoded using the ASN.1 format and are sent to the charging gateway function (CGF) using the GPRS Tunneling Protocol Prime (GTPP) as defined in the following standards:

- 3GPP TS 29.060
- 3GPP TS 32.015
- 3GPP TS 32.215
- 3GPP TS 32.251
- 3GPP TS 32.298 v 6.2.0 (for G-CDRs)
- 3GPP TS 32.298 v 6.4.1 (for eG-CDRs)

Also see the *G-CDR and Enhanced G-CDR Field Reference Tables* chapter for information on CDR fields supported in G-CDRs and eG-CDRs.



**Important:** The behavior for several of the fields supported in CDRs can be modified. For more information, refer to the `gtpp attributes` command in the *Command Line Interface Reference*.

---

# CDR Fields

## Access Point Name Network Identifier

The network identifier portion of the Access Point Name (APN). The APN typically corresponds to a registered Internet domain name and represents the external Packet Data Network (PDN) that the GGSN is connected to.

**Format**

IA5 string

**Length**

1–65 bytes

## APN Selection Mode

An index indicating how the APN was selected.

The following APN selection mode indexes are possible:

- 0: MS or network provided APN, subscribed verified
- 1: MS provided APN, subscription not verified
- 2: Network provided APN, subscription not verified

**Format**

Unsigned integer.

**Length**

1 byte.

## CAMEL Information

Set of CAMEL information related to PDP context. This field is present if CAMEL Charging Information is received by the GGSN in the GTP Create PDP context request.



**Important:** Presently E-GCDRs does not support this field.

**Format**

Octet string.

## Cause for Record Closing

The reason the record is released from the GGSN.

Some of the possible reasons are as follows:

- normalRelease (0): The PDP context was terminated normally through a PDP context release (end of context or SGSN change) or a GPRS detach.
- abnormalRelease (4): The PDP context was abnormally terminated.
- cAMELInitCallRelease (5)
- volumeLimit (16): The PDP context was terminated due to exceeding volume limit.
- timeLimit (17): The PDP context was terminated due to exceeding time limit.
- sGSNChange (18): The PDP context was terminated due to change in SGSN.
- maxChangeCond (19): The PDP context was terminated due to exceeding the changed condition limit.
- managementIntervention (20): The record was closed due to an O&M request.
- intraSGSNIIntersystemChange (21)
- rATChange (22): The PDP context was terminated due to change in RAT.
- mSTimeZoneChange (23): The PDP context was terminated due to change in time zone of MS.
- unauthorizedRequestingNetwork (52)
- unauthorizedLCSClient (53)
- positionMethodFailure (54)
- unknownOrUnreachableLCSClient (58)
- listofDownstreamNodeChange (59)
- Partial record generation: A partial CDR was generated for reasons such as the reaching of data volume or time (duration) limits, or reaching the maximum number of charging condition changes.



**Important:** Please note that the following fields – cAMELInitCallRelease (5), unauthorizedRequestingNetwork (52), unauthorizedLCSClient (53), positionMethodFailure (54), unknownOrUnreachableLCSClient (58), and listofDownstreamNodeChange (59) are currently not supported.

#### Format

Unsigned integer.

#### Length

1 byte.

## Charging Characteristics

Lists the charging characteristics applied to the PDP context.

The GGSN can accept charging characteristics from the SGSN or use its own. GGSN configured charging characteristics are specified as part of the GGSN Service and are applied to subscriber PDP contexts through APN templates. Refer to the *Administration and Configuration Guide* for information on configuring GGSN-based charging characteristics.

#### Format

Hex value octet string.

#### Length

2 bytes.

## Charging ID

The GGSN-generated value used to identify this PDP context.

### Format

Unsigned integer

### Length

1-4 bytes

## ChSelectionMode

The charging characteristic type that the GGSN applied to the CDR.

The following values for this field are supplied:

- Home default: GGSN configured charging characteristics for home subscribers are used. Home subscribers are those that belong to the same PLMN as the one on which the GGSN is located.
- Visiting default: GGSN configured charging characteristics for visiting subscribers are used. Visiting subscribers are those that belong to a different PLMN than the one on which the GGSN is located.
- Roaming default: GGSN configured charging characteristics for roaming subscribers are used. Roaming subscribers are those that are serviced by an SGSN belonging to a different PLMN than the one on which the GGSN is located.
- SGSN supplied: The GGSN is using the charging characteristics supplied by the SGSN.

### Format

Enumerated integer.

### Length

1 byte.

## Diagnostics

This field is included in the CDR when the PDP context is released.

This field is supported both in GCDRs and E-GCDRs. However, this field will be populated in E-GCDRs only when **gtpp attribute diagnostics** command is configured in gtpp group. It will contain one of the following values:

- 36: If the SGSN sends Delete PDP context request
- 38: If GGSN sends delete PDP context request due to GTP-C/U echo timeout with SGSN
- 40: If the GGSN sends delete PDP context request due to receiving a RADIUS Disconnect request message.
- 26: If the GGSN sends delete PDP context request for any other reason

### Format

Unsigned integer.

### Length

1-4 bytes.

## Duration

The time period, in seconds, that the record existed in the GGSN. It is the duration from Record Opening Time to record closure. For partial records, only the duration of the individual partial record is provided.

**Format**

Unsigned integer.

**Length**

1–4 bytes.

## Dynamic Address Flag

The presence of this field indicates that the **Served PDP Address** was dynamically assigned during context activation.

**Format**

Boolean

**Length**

1 byte

## External Charging Identifier

A charging identifier received from an external, non-GPRS entity.



**Important:** This field is not supported at this time.

**Format**

Octet string.

## GGSN Address

The binary-represented IPv4 address of the GGSN used.

**Format**

Hex value octet string

**Length**

4 bytes

## IMS Signalling Context

Indicates whether or not the PDP context is used for IMS signaling based on the setting of the "IM CN Subsystem Signalling Flag" conveyed via the "Activate PDP context request" message from the MS to the network.



**Important:** This field is not supported at this time.

**Format**

Octet string.

## List of Service Data Volumes

A list of the changes that occurred in charging conditions for all service data flows for the PDP context.

The first container includes an optional field “QoS Negotiated”. In following containers “QoS Negotiated” is present if the previous change condition is “QoS change”. The list will include one or more of the following fields:

- Service Identifier: Service identifier is an identifier for a service. The service identifier may designate an end user service, a part of an end user service or an arbitrarily formed group thereof. Present only if the rating group is online (DCCA) charged.
- Rating Group: This is the service flow identity and has to be used for differentiated evaluation of user's traffic. This is also known as content-id.
- Charging Rulebase Name: The name of the Rulebase used for charging This is the group name of charging rules.
- Result Code: The result code AVP. This contains the result code after the interconnection with the CRF. Present only if the rating group is online (DCCA) charged.
- Local Seq No: A per service data container sequence number. It starts from 1 for each service, increasing by 1 for each service date container generated for that service within the lifetime of this PDP session.
- Time of first usage: The time stamp for the first IP packet to be transmitted for the service data flow referred to the current instance of Service Condition Change.
- Time of last usage: The time stamp for the last IP packet to be transmitted for the service data flow referred to the current instance of Service Condition Change.
- Usage time: The difference between “time of first usage” and “time of last usage”.
- User Location Information: The User Location Information for the MS if provided by the SGSN to the GGSN during the PDP context activation/modification procedure.
- Service change condition: The reason for closing the service data container for triggers like SGSN change, QoS change, Rat change, time and volume triggers, etc.
- QoS negotiated: The negotiated QoS applied for the service data flow.
- Sgsn-address: The valid SGSN IP address during the service data recording interval.
- SGSN PLMN identifier: The valid SGSN PLMN Id during the service data recording interval.
- FBC Data volume uplink: The number of octets transmitted during the use of the packet data services in the uplink direction.
- FBC data volume downlink: The number of octets transmitted during the use of the packet data services in the downlink direction.
- Time of Report: A time stamp defining the moment when the service data container is closed.
- Rat Type: The valid radio access technology type during the service data recording interval.
- Failure handling Continue: A Boolean expression included if the failure handling condition has been executed. Present only if the rating group is online (DCCA) charged and if failure handling procedure is executed by DCCA.

### Format

- Service Identifier: Integer
- Rating Group: Integer

- Charging Rulebase Name: IA5 octet string
- Result Code: Integer
- Local Seq No: Integer
- Time of first usage: BCD encoded octet string
- Time of last usage: BCD encoded octet string
- Usage time: Unsigned integer
- Service change condition: Bit string
- QoS negotiated: Octet string
- Sgsn-address: Hex value octet string
- SGSN PLMN identifier: Hex value octet string
- FBC Data volume uplink: Integer
- FBC data volume downlink: Integer
- Time of Report: BCD encoded octet string
- Rat Type: Integer(1-255)
- Failurehandling Continue: Boolean

#### Length

- Service Identifier: 4 bytes
- Rating Group: 4 bytes
- Charging Rulebase Name: 1-64 bytes
- Result Code: 4 bytes
- Local Seq No: 4 bytes
- Time of first usage: 9 bytes
- Time of last usage: 9 bytes
- Usage time: 4 bytes
- Service change condition: 32 bits (4 bytes) (see note below)
- QoS negotiated: 12 bytes
- Sgsn-address: 4 bytes
- SGSN PLMN identifier: 3 bytes
- FBC Data volume uplink: 4 bytes
- FBC data volume downlink: 4bytes
- Time of Report: 9 bytes
- Rat Type: 1 byte
- Failurehandling Continue: 1 byte



**Important:** When encoding the Service Change Condition bit string, the following rule is applied: "In a primitive encoding, the first contents octet gives the number of bits by which the length of the bit string is less than the next multiple of eight (this is called the 'number of unused bits'). The second and following contents octets give the value of the bit string, converted to an octet string." [As stated in *A Layman's Guide to a Subset of ASN.1, BER, and DER* -

**■ CDR Fields**

*Burton S. Kaliski section 5.4]* For example, serviceConditionChange is set to "88 0403 0400 00" to continue the ongoing session case. "03" represents the number of unused bits according to ASN.1 encoding which indicates that the octet following the length octet actually gives the number of unused bits.

---

## List of Traffic Data Volumes

A list of the changes that occurred in the charging conditions for this PDP context.

The list will include one or more containers each including the following fields:

- QoS negotiated: Quality of service (QoS) has been negotiated. The initial and final corresponding data values are listed. This is only added for the first container and the container after a QoS change.
- Uplink volume: The number of octets (uncompressed) received from the MS. The initial and final corresponding data values are listed.
- Downlink volume: The number of octets (uncompressed) transmitted to the MS. The initial and final corresponding data values are listed.
- Change Condition: Identifies the reason that the container was closed such as tariff time change, QoS change, or closing of the CDR.
- Change Time: A time stamp identifying the time at which the volume container or the CDR closed.

For GPRS, data volumes are in octets above the GTP layer and are separated for uplink and downlink traffic. In UMTS, data volumes are in octets above the GTP-U layer and are separated for uplink and downlink traffic.

**Format**

- QoS negotiated: Octet String
- Uplink volume: Integer
- Downlink volume: Integer
- Change Condition: Integer
- Change Time: BCD encoded octet string

**Length**

- QoS negotiated: 12 bytes
- Uplink volume: 4 bytes
- Downlink volume: 4 bytes
- Change Condition: 1 byte
- Change Time: 9 bytes

---

## Local Record Sequence Number

For a Node ID, this number is allocated sequentially for each CDR. This along with a Node ID uniquely identifies a CDR.

**Format**

Unsigned integer.

**Length**

1–4 bytes.

---

## MS Time Zone

The “Time Zone” IE that the SGSN may provide to the GGSN during the PDP context activation/modification procedure.

**Format**

Hex value octet string.

**Length**

2 bytes.

---

## Network Initiated PDP Context

The presence of this field indicates that the PDP context was initiated by the network.

**Format**

Boolean

**Length**

1 byte

---

## Node ID

The identifier string for the GGSN that had generated the CDR. Node ID along with local record sequence number uniquely identifies a CDR.

**Format**

Octet string.

**Length**

1–16 bytes.

---

## PDP Type

The PDP context type. The PDP types supported by the GGSN are IP or PPP (including IHOSS:OSP).

**Format**

Hex value octet string

**Length**

2 bytes

---

## Radio Access Technology (RAT) Type

The SGSN may include the RAT Type IE along with User Location Information IE, and MS Time Zone IE if they are available. The RAT Type IE shall not be included for the MS-initiated PDP Context Modification procedure.

**Format**

Integer(1-255).

**Length**

1 byte.

## Record Extensions

A set of network operator or manufacturer specific extensions which may be added to the record if provided. It is used for reporting flows and volumes consumed, and also for passing key information about the session into the downstream charging systems.



**Important:** This field is customer specific.

## Record Opening Time

The timestamp at which the PDP context was activated on the GGSN.

**Format**

BCD encoded octet string.

**Length**

9 bytes.

## Record Sequence Number

A running sequence number used to link partial records generated by the GGSN for a specific PDP context (characterized with the same Charging ID and GGSN address pair). This field is only present for partial records.

**Format**

Unsigned integer.

**Length**

1–4 bytes.

## Record Type

Indicates the GGSN PDP context record type. From the GGSN, this will be G-CDR.

**Format**

Integer

**Length**

1–4 bytes

## Served IMEISV

The International Mobile Equipment Identity and Software Version Number (IMEISV) of the MS, if available.

**Format**

BCD encoded octet string.

**Length**

8 bytes.

## Served IMSI

The International Mobile Subscriber Identity (IMSI) of the MS. The IMSI is formatted in accordance with 3GPP TS 23.003. This will be present if the Anonymous Access Indicator is FALSE or not supplied.

**Format**

BCD encoded octet string

**Length**

3 to 8 bytes

## Served MSISDN

The Mobile Station (MS) ISDN number (MSISDN) of the subscriber.

**Format**

BCD encoded octet string.

**Length**

1–9 bytes.

## Served PDP Address

The binary-represented IPv4/IPv6 address associated with the PDP context for the CDR. This address could either be static or dynamically assigned.

**Format**

Hex value octet string

**Length**

4 bytes for IPv4 address

16 bytes for IPv6 address

## SGSN Address

A list of all of the SGSN IPv4 addresses (binary-represented) used over the duration of the CDR. The address(es) can be either user or control-plane addresses.

**Format**

Hex value octet string

**Length**

4 bytes per address

## SGSN PLMN Identifier

RAI (optionally supplied by SGSN in the GTP create PDP context request) is used as SGSN PLMN Identifier value. It is omitted if the SGSN does not supply the RAI.

**Format**

Hex value octet string.

**Length**

3 bytes.

---

## User Location Information

The User Location Information for the MS if provided by the SGSN to the GGSN during the PDP context activation/modification procedure.

**Format**

Octet string.

**Length**

8 bytes.

# Chapter 10

## P-CDR Field Reference Tables

---

This chapter provides reference tables for the CDR fields reported as part of P-GW CDRs (P-CDRs) generated by the system.

A complete list of supported CDR fields is provided in the *P-CDR Field Descriptions* chapter of this reference guide.

The specific CDRs reported in P-CDRs and their encoding are user-selectable via GTPP dictionaries. The use of GTPP dictionaries is configurable using the **gtpp dictionary** command in the Context Configuration Mode of the system's Command Line Interface (CLI).

This section provides information on the fields reported in P-CDRs for the GTPP dictionaries.



**Important:** For more information on custom dictionaries, contact your local service representative.

The category column in all tables use keys described in the following table.

**Table 10. Dictionary Table Key**

Abbreviation	Meaning	Description
M	Mandatory	A field that must be present in the CDR.
C	Conditional	A field that must be present in a CDR if certain conditions are met.
O <sub>M</sub>	Operator Provisionable: Mandatory	A field that an operator has provisioned and must be included in the CDR for all conditions.
O <sub>c</sub>	Operator Provisionable: Conditional	A field that an operator has provisioned that must be included in the CDR if certain conditions are met.

# CDR Fields Supported in P-CDRs

The table in this section lists the P-CDR fields present in the available GTPP dictionaries.

## Custom Dictionaries

The following custom dictionaries are supported:

- custom1
- custom2
- custom3
- custom4
- custom5
- custom7
- custom8
- custom40

Field	Category	Description
Record Type	M	P-GW IP CAN bearer record
Served IMSI	M	IMSI of the served party (if Anonymous Access Indicator is FALSE or not supplied)
P-GW Address	M	The control plane IP address of the P-GW used.
Charging ID	M	IP CAN bearer identifier used to identify this IP CAN bearer in different records created by PCNs
Serving Node Address	M	List of serving node control plane IP addresses (e.g. SGSN, MME, etc.) used during this record.
Access Point Name Network Identifier	O <sub>M</sub>	The logical name of the connected access point to the external packet data network (network identifier part of APN).
PDP/PDN Type	O <sub>M</sub>	Indicates PDP type (IP, PPP, or IHOSS:OSP) or PDN type (IPv4, IPv6, or IPv4v6).

Served PDP/PDN Address	O <sub>c</sub>	IP address allocated for the PDP context / PDN connection (IPv4 or IPv6), if available.
Dynamic Address Flag	O <sub>c</sub>	Indicates whether served PDP/PDN address is dynamic, which is allocated during IP CAN bearer activation, initial attach (E-UTRAN or over S2x) and UE requested PDN connectivity. This field is missing if address is static.
Record Opening Time	M	Time stamp when IP CAN bearer is activated in this S-GW or record opening time on subsequent partial records.
Duration	M	Duration of this record in the S-GW.
Cause for Record Closing	M	The reason for the release of record from this P-GW.
Diagnostics	O <sub>c</sub>	A more detailed reason for the release of the connection.
Record Sequence Number	C	Partial record sequence number, only present in case of partial records.
Node ID	O <sub>M</sub>	Name of the recording entity.
Local Record Sequence Number	O <sub>M</sub>	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
APN Selection Mode	O <sub>M</sub>	An index indicating how the APN was selected.
Served MSISDN	O <sub>M</sub>	The primary MSISDN of the subscriber.
Charging Characteristics	M	The Charging Characteristics applied to the IP CAN bearer.
Charging Characteristics Selection Mode	O <sub>M</sub>	Information about how Charging Characteristics were selected.
Serving Node PLMN Identifier	O <sub>M</sub>	Serving node PLMN Identifier (MCC and MNC) used during this record, if available.
Served IMEISV	O <sub>c</sub>	IMEISV of the ME, if available.
RAT Type	O <sub>c</sub>	Indicates the Radio Access Technology (RAT) type currently used by the Mobile Station, when available.
MS Time Zone	O <sub>c</sub>	Indicates the offset between universal time and local time in steps of 15 minutes where the MS currently resides.

## ■ CDR Fields Supported in P-CDRs

User Location Information	O <sub>c</sub>	Contains the User Location Information of the MS as defined in TS 29.060 [203] for GPRS case, and in TS 29.274 [210] for EPC case, if available.
List of Service Data	O <sub>M</sub>	List of changes in charging conditions for all service data flows within this IP CAN bearer categorized per rating group or per combination of the rating group and service id.
Data Service Volume Block	O <sub>M</sub>	Service data container associated with a service condition change on a service data flow (categorized per rating group or per combination of the rating group and service id) within this IP CAN bearer.
Rating Group	O <sub>M</sub>	Service flow identity, also known as content-id.
Charging Rulebase Name	O <sub>c</sub>	Name of the Rulebase used for charging.
Local Sequence Number (LOSD)	O <sub>c</sub>	Service data container sequence number.
Time of First Usage	O <sub>c</sub>	Timestamp for the first IP packet to be transmitted for the service data flow.
Time of Last Usage	O <sub>c</sub>	Timestamp for the last IP packet to be transmitted for the service data flow.
Time Usage	O <sub>c</sub>	Difference in seconds, within range of 0 to 4294967295, between “time of first usage” and “time of last usage”.
Service Condition Change	O <sub>c</sub>	Reason for closing the service data container.
QoS Information Negotiated	O <sub>c</sub>	Authorized QoS for the IP-CAN bearer.
Serving Node Address (LOSD)	O <sub>c</sub>	IP address of the serving node (SGSN/S-GW) control plane.
Data Volume FBC Uplink	O <sub>c</sub>	Number of octets received in the uplink direction for this container.
Data Volume FBC Downlink	O <sub>c</sub>	Number of octets transmitted in the downlink direction for this container.
Time of Report	O <sub>M</sub>	Timestamp defining the moment when the service data container is closed.
Service Identifier	O <sub>c</sub>	Identifier for a service.

User Location Information (LOSD)	O <sub>c</sub>	Location of the user known at the time when container is created.
Serving node Type	M	List of serving node types in control plane. The serving node types listed here map to the serving node addresses listed in the field “Serving node Address” in sequence.
Served MNNAI	O <sub>c</sub>	Mobile Node Identifier in NAI format (based on IMSI), if available.
P-GW PLMN Identifier	O <sub>c</sub>	PLMN identifier (MCC MNC) of the P-GW.
Start Time	O <sub>c</sub>	The time when User IP-CAN session starts, available in the CDR for the first bearer in an IP-CAN session.
Stop Time	O <sub>c</sub>	The time when User IP-CAN session is terminated, available in the CDR for the last bearer in an IP-CAN session .
PDN Connection Id	O <sub>M</sub>	PDN connection (IP-CAN session) identifier to identify different records belonging to same PDN connection.

## Notes:

- custom7: This customer-specific file format contains CDRs converted from ASN.1 format to ASCII format according to the following conventions. Each line in the file consists of one CDR which contains 33 parameters occupying 491 bytes.



# Chapter 11

## P-CDR Field Descriptions

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This chapter lists and describes the fields supported by the system for use in P-GW charging data records (P-CDRs).

The following information is provided for each field:

- **Description:** The field's description.
- **Format:** The field's data format.
- **Length:** The field's size, in bytes.

All P-CDRs are encoded using the ASN.1 format and are sent to the charging gateway function (CGF) using the GPRS Tunneling Protocol Prime (GTPP) as defined in the following standards:

- 3GPP TS 29.060
- 3GPP TS 32.015
- 3GPP TS 32.215
- 3GPP TS 32.251
- 3GPP TS 32.298 v8.5.0 (for P-CDRs)

Also see the *P-CDR Field Reference Tables* chapter for information on CDR fields supported in P-CDRs.



**Important:** The behavior for several of the fields supported in CDRs can be modified. For more information, refer to the **gtpp attributes** command in the *Command Line Interface Reference*.

# CDR Fields

## Access Point Name Network Identifier

The network identifier portion of the access point name (APN). This APN is sent to the S-GW by the MME and is relayed to the P-GW in the EGTP Create Session Request message.

The APN string may consist of alphabetic characters (“A…Z”, “a…z”), digits (“0…9”) and the dash “-”.

**Format**

IA5 string

**Length**

1–63 bytes

## APN Selection Mode

An index indicating how the APN was selected.

The following APN selection mode indexes are possible:

- 0: MS or network provided APN, subscription verified
- 1: MS provided APN, subscription not verified
- 2: Network provided APN, subscription not verified

**Format**

Enumerated

**Length**

1 byte

## Cause for Record Closing

This field contains a reason for the closure of the CDR.

Some of the possible reasons are as follows:

- normalRelease (0): The PDP context was terminated normally through a PDP context release (end of context or SGSN change) or a GPRS detach.
- abnormalRelease (4): The PDP context was abnormally terminated.
- volumeLimit (16): The PDP context was terminated due to exceeding volume limit.
- timeLimit (17): The PDP context was terminated due to exceeding time limit.
- servingNodeChange (18): The PDP context was terminated due to Serving Node Address List Overflow.
- maxChangeCond (19): The PDP context was terminated due to exceeding the changed condition limit.
- managementIntervention (20): The record was closed due to an O&M request.
- rATChange (22): The PDP context was terminated due to change in RAT.

- mSTimeZoneChange (23): The PDP context was terminated due to change in time zone of MS.
- sGSNPLMNIDChange (24)
- Partial record generation: A partial CDR was generated for reasons such as the reaching of data volume or time (duration) limits, or reaching the maximum number of charging condition changes.

**Format**

Integer

**Length**

1 byte

---

## Charging Characteristics

Lists the charging characteristics applied to the PDP context by the P-GW.

**Format**

Octet string

**Length**

2 bytes

---

## Charging Characteristics Selection Mode

This field specifies how the Charging Characteristics were selected.

Supported values:

- servingNodeSupplied (0)
- homeDefault (3)
- roamingDefault (4)
- visitingDefault (5)
- AAASupplied (6)
- GWOVERRIDE (7)

**Note:** The values AAASupplied (6) and GWOVERRIDE (7) are only supported in the custom40 GTPP dictionary.

**Format**

Enumerated

**Length**

1 byte

---

## Charging ID

This field contains a charging identifier, which can be used together with the P-GW address to identify all records involved in a single bearer context. The Charging ID is generated by the P-GW during bearer context activation and is transferred to the context requesting P-GW.

**Format**

Integer

## ■ CDR Fields

**Length**

1–5 bytes

---

## Diagnostics

This field is included in the CDR when the bearer is released and when the option `gtpp attribute diagnostics` is configured.

**Format**

Integer

**Length**

1–4 bytes

---

## Duration

This field contains the duration in seconds for the record. The value is reset for each new partial CDR.

This value is converted from the internal representation in milliseconds to an integer value representing only seconds. The mechanism for this conversion (ceiling, floor, round-off) can be configured.

**Format**

Integer

**Length**

1–5 bytes

---

## Dynamic Address Flag

This field indicates that the PDN address has been dynamically allocated for that particular IP CAN bearer (PDN connection). This field is missing if the address is static.

**Format**

Boolean

**Length**

1 byte

---

## List of Service Data

This list includes one or more service data containers. Each container is associated with a service condition change on a service data flow (categorized per rating group or per combination of the rating group and service id) within this IP CAN bearer.

**Format**

Sequence

**Length**

Variable

---

## Data Service Volume Block

This is a service data container. A container is associated with a service condition change on a service data flow (categorized per rating group or per combination of the rating group and service id) within this IP CAN bearer.

A service data container may include the fields in the following subsections.

**Format**

Sequence

**Length**

Variable

---

### Charging Rulebase Name

The name of the Rulebase used for charging. This is the group name of charging rules.

**Format**

IA5string

**Length**

1–16 bytes

---

### Data Volume FBC Downlink

The number of octets transmitted during the use of the packet data services in the downlink direction.

**Format**

Integer

**Length**

1–5 bytes

---

### Data Volume FBC Uplink

The number of octets received during the use of the packet data services in the uplink direction.

**Format**

Integer

**Length**

1–5 bytes

---

### Local Sequence Number (LOSD)

A service data container sequence number. It starts from 1 and is increased by 1 for each service data container generated within the lifetime of this IP-CAN bearer.

**Format**

Integer

**Length**

1–5 bytes

---

### QoS Information Negotiated

For an IP-CAN bearer-specific container, this contains the authorized QoS for the IP-CAN bearer. The first container for each QCI/ARP pair includes this field. In following containers this field is present if the previous change condition is "QoS change".

The field contains a sequence of fields which are described in the following subsections:

- qCI [1] Integer
- maxRequestedBandwidthUL [2] Integer Optional
- maxRequestedBandwidthDL [3] Integer Optional
- guaranteedBitrateUL [4] Integer Optional
- guaranteedBitrateDL [5] Integer Optional
- aRP [6] Integer Optional

**Format**

Sequence

**Length**

Variable

---

### Allocation and Retention Priority (ARP)

The ARP contains information about the priority level (scalar), the pre-emption capability (flag) and the pre-emption vulnerability (flag). The primary purpose of ARP is to decide whether a bearer establishment or modification request can be accepted, or needs to be rejected due to resource limitations (typically available radio capacity for GBR bearers). Range: 1-15.

**Format**

Integer

**Length**

1-5 bytes

---

### Guaranteed Bit Rate (GBR) Downlink

The GBR denotes the downlink bit rate that can be expected to be provided by a GBR bearer.

**Format**

Integer

**Length**

1-5 bytes

---

### Guaranteed Bit Rate (GBR) Uplink

The GBR denotes the uplink bit rate that can be expected to be provided by a GBR bearer.

**Format**

Integer

**Length**

1–5 bytes

**Maximum Bit Rate (MBR) Downlink**

The MBR limits the downlink bit rate that can be expected to be provided by a GBR bearer (for example, excess traffic may get discarded by a rate shaping function).

**Format**

Integer

**Length**

1–5 bytes

**Maximum Bit Rate (MBR) Uplink**

The MBR limits the uplink bit rate that can be expected to be provided by a GBR bearer.

**Format**

Integer

**Length**

1–5 bytes

**Quality Class Identifier (QCI)**

A QCI is a scalar that is used as a reference to access node-specific parameters that control bearer level packet forwarding treatment (for example, scheduling weights, admission thresholds, queue management thresholds, link layer protocol configuration, etc.), and that have been pre-configured by the operator owning the access node (for example, eNodeB). Value Range: 1-9.

**Format**

Integer

**Length**

1–5 bytes

**Rating Group**

This is the service flow identity and must be used for differentiated evaluation of user's traffic. This is also known as content-id.

**Format**

Integer

**Length**

1–5 bytes

**Service Condition Change**

The reason for closing the service data container for triggers like SGSN change, QoS change, RAT change, time and volume triggers, etc.

Bit Setting regarding TS 32.298:

- qoSChange (0), bearer modification
- sGSNChange (1), bearer modification
- sGSNPLMNIDChange (2), bearer modification
- tariffTimeSwitch (3), tariff time change
- pDPCContextRelease (4), bearer release
- rATChange (5), bearer modification
- serviceIdledOut (6), IP flow idle out, DCCA QHT expiry
- reserved (7), old: QCTexpiry is no report event
- configurationChange (8), configuration change
- serviceStop (9), IP flow termination
- dCCATimeThresholdReached (10), DCCA quota reauth.
- dCCAVolumeThresholdReached (11), DCCA quota reauth.
- dCCAServiceSpecificUnitThresholdReached (12), DCCA quota reauth.
- dCCATimeExhausted (13), DCCA quota reauth.
- dCCAVolumeExhausted (14), DCCA quota reauth.
- dCCAValidityTimeout (15), DCCA quota validit time (QVT expiry)
- reserved (16), reserved due to no use case, old: return Requested is covered by (17), (18)
- dCCAREauthorisationRequest (17), DCCA quota reauthorization request by OCS
- dCCAContinueOngoingSession (18), DCCA failure handling continue IP flow
- dCCARetryAndTerminateOngoingSession (19), DCCA failure handling terminate IP flow after DCCA retry
- dCCATerminateOngoingSession (20), DCCA failure handling, terminate IP flow
- cGI-SAIChange (21), bearer modification
- rAIChange (22), bearer modification
- dCCAServiceSpecificUnitExhausted (23), DCCA quota reauthorization
- recordClosure (24), PGW-CDR closure
- timeLimit (25), intermediate recording
- volumeLimit (26), intermediate recording
- serviceSpecificUnitLimit (27), intermediate recording
- envelopeClosure (28)
- eCGIChange (29), bearer modification. “ECGI Change”
- tAIChange (30), bearer modification. “TAI Change”
- userLocationChange (31) bearer modification. “User Location Change”

**Format**  
Bit string

**Length**  
5 bytes

---

### Service Identifier

The service identifier may designate an end user service, a part of an end user service, or an arbitrarily formed group thereof. This field is only included if reporting is per combination of the rating group and service id.

**Format**  
Integer

**Length**  
1–5 bytes

---

### Serving Node Address (LOSD)

This field contains the serving node (for example, SGSN/S-GW) control plane IP address.

**Format**  
Octet string

**Length**  
6 or 18 bytes (depending on v4 or v6 address)

---

### Time of First Usage

The timestamp for the first IP packet to be transmitted for the service data flow referred to the current instance of Service Condition Change.

**Format**  
BCD encoded octet string

**Length**  
9 bytes

---

### Time of Last Usage

The timestamp for the last IP packet to be transmitted for the service data flow referred to the current instance of Service Condition Change.

**Format**  
BCD encoded octet string

**Length**  
9 bytes

---

### Time of Report

A timestamp defining the moment when the service data container is closed.

**Format**  
BCD encoded octet string

## ■ CDR Fields

**Length**  
9 bytes

**Time Usage**

The difference in seconds within the range of 0.to.4294967295 between “time of first usage” and “time of last usage”.

**Format**  
Integer  
**Length**  
1–5 bytes

**User Location Information (LOSDV)**

This field indicates details of where the UE is currently located (SAI, TAI, RAI, CGI, ECGI or access-specific user location information).

**Format**  
Octet string  
**Length**  
6–13 bytes

**Local Sequence Number**

This field contains a unique sequence number associated with the NodeId field and independent of the bearer context.

**Format**  
Integer.  
**Length**  
1–5 bytes

**MS Time Zone**

The “Time Zone” IE that the SGSN may provide to the P-GW during the PDP context activation/modification procedure.

**Format**  
Octet string  
**Length**  
2 bytes.

**Node ID**

This field contains an identifier string for the node that had generated the CDR.

On the Cisco P-GW, this NodeID field is a printable string in the format ndddSTRING:

- n: The first digit is the Sessmgr restart counter having a value between 0 and 7.
- ddd: The number of the sessmgr instance generating the CDR

- STRING: This is a configured Node-ID-Suffix having any string between 1 to16 characters, defined using the `gtpp attribute node-id` command.

If this node-id-suffix is not configured, the PGW uses the active-charging service name as the Node-id-suffix (truncated to 16 characters).

This field is only included when the option `gtpp attribute local-record-sequence-number` is configured.

**Format**

IA5string

**Length**

1–20 bytes.

## PDN Connection Id

This field defines the PDN connection (IP-CAN session) identifier to identify different records belonging to same PDN connection. This field includes the Charging Id of the first IP-CAN bearer activated within the PDN connection. Together with P-GW address, this uniquely identifies the PDN connection.

**Format**

Integer

**Length**

1–5 bytes

## PDP PDN Type

### -- OCTET 1: PDP Type Organization

Spare '1111' PDP Type Organization Value

PDP Type Organization	Value
ETSI	0
IETF	1

Note: In LTE, only IETF is supported.

### -- OCTET 2: PDP/PDN Type Number

Bits 3 2 1 0 0 1 IPv4 0 1 0 IPv6 0 1 1  
 IPv4/IPv6 Bits 8-4 of octet are spare and are coded as zero.

**Format**

Octet string

**Length**

2 bytes

## P-GW Address

These field is the serving P-GW IP address for the Control Plane. If both an IPv4 and an IPv6 address of the P-GW is available, the P-GW shall include the IPv4 address in the CDR.

**Format**

Octet string

**Length**

6 or 18 bytes (depending on v4 or v6 address)

## P-GW PLMN Identifier

This field is the P-W PMLN Identifier (Mobile Country Code and Mobile Network Code).

The MCC and MNC are coded as described for “User Location Info” in TS 29.274 [91].

**Format**

Octet string

**Length**

3 bytes

## RAT Type

Holds the value of RAT Type, as provided to S-GW and P-GW.

RAT Types	Values (Decimal)
<reserved>	0
UTRAN	1
GERAN	2
WLAN	3
GAN	4
HSPA Evolution	5
EUTRAN	6
<spare>	7-255

The field is provided by the SGSN/MME and transferred to the S-GW/P-GW during the IP-CAN bearer activation/modification.

**Format**

Integer

**Length**

1 byte

## Record Opening Time

This field contains the timestamp when a PDP context is activated in PGW or when a subsequent record is opened after a partial record.

The timestamp is determined based on the internal timer which has an accuracy of 10ms. Depending on the configured mechanism (ceiling, floor, or round-off) this field is translated to only show full seconds.

TimeStamp ::= OCTET STRING (SIZE(6))

The contents of this field are a compact form of the UTCTime format containing local time plus an offset to universal time. Binary coded decimal encoding is employed for the digits to reduce the storage and transmission overhead

- e.g. YYMMDDhhmmssShhmm
- where
- YY = Year 00 to 99 BCD encoded
- MM = Month 01 to 12 BCD encoded
- DD = Day 01 to 31 BCD encoded
- hh = hour 00 to 23 BCD encoded
- mm = minute 00 to 59 BCD encoded
- ss = second 00 to 59 BCD encoded
- S = Sign 0 = "+", "-" ASCII encoded
- hh = hour 00 to 23 BCD encoded
- mm = minute 00 to 59 BCD encoded

**Format**

BCD encoded octet string

**Length**

9 bytes

## Record Sequence Number

A running sequence number within the range of 1 to 4294967296 used to link partial records generated by the P-GW for a specific IP-CAN bearer context (characterized with the same Charging ID and P-GW address). This field is not present if the first record is also the final record.

**Format**

Integer

**Length**

1–5 bytes

## Record Type

This field identifies the type of the record:

GW-CDR(pgwPDPRecord) 85 (0x55)

**Format**

## ■ CDR Fields

Integer

**Length**

1 byte

**Served IMEISV**

This field contains the International Mobile Equipment Identity (IMEISV) of the equipment served.

The structure of the IMEI is defined in TS 23.003.

The IMEI is composed of the following elements:

- Type Allocation Code (TAC). Its length is 8 digits.
- Serial Number (SNR) is an individual serial number uniquely identifying each equipment within each TAC. Its length is 6 digits.
- Software Version Number (SVN) identifies the software version number of the mobile equipment. Its length is 2 digits.

If SV is not available, a filler digit “f” is added after the spare digit to fill up the last byte. Spare digit: this digit shall be zero, when transmitted by the MS.

**Format**

BCD encoded octet string

**Length**

8 bytes

**Served IMSI**

The International Mobile Subscriber Identity (IMSI) of the MS. The IMSI is formatted in accordance with 3GPP TS 23.003. This will be present if the Anonymous Access Indicator is FALSE or not supplied.

The IMSI is formatted in accordance with 3GPP TS 23.003.

**Format**

BCD encoded octet string

**Length**

3–8 bytes

**Served MSISDN**

The field tracks the Mobile Station (MS) ISDN number (MSISDN) of the subscriber which is transparently copied from the Create Session Request message.

The MSISDN is TBCD encoded as shown in the example below:3GPP TS 23.003 (CCITT Rec. E 213)

ServedMSISDN ::= OCTET STRING (SIZE(1..9))

subscriber identification MSISDN

octet 1 : bit 8 (msb): extension bit

= 1 : no extension

other : not relevant

bit 7..5 : type of number  
 = 000 : unknown  
 = 001 : international number  
 = 010 : national significant number  
 = 011 : network specific number  
 = 100 : subscriber number  
 = 101 : reserved  
 = 110 : abbreviated number  
 = 111 : reserved for extension

bit 4..1 : numbering plan indicator  
 = 0001: ISDN/Telephony Numbering Plan (Rec CCITT E.164)  
 other : not relevant

octet 2..9: <= 16 digits TBCD-String (twisted)  
 substructure (without spares or fillers):  
 1..3 digits - country code (CC)  
 (only international number)  
 3 digits - national destination code (NDC)  
 <= 10 digits - subscriber number (SN)  
 first and intermediate octet = 2 digits  
 last octet = 2 digits or 1 digit + 1 fill digit H'F

example:

MSISDN: '<internat #><E.164>491720400305'  
 encoded: H'91 94 71 02 04 30 50

#### Format

BCD encoded octet string.

#### Length

1–9 bytes.

---

## Serving Node Address

The serving node control plane IP address of the S-GW used during this record. This is a list of IP addresses. If the list overflows with a configured number of IP addresses, a CDR with “serving node Change” as cause for record closure will be

## ■ CDR Fields

generated. The serving node addresses that are listed here are sequentially mapped to the serving node types listed in the field “Serving node Types”.

**Format**

Sequence of IPv4 or IPv6 addresses.

**Length**

6-98 or 18-292 bytes (depending on IPv4 or IPv6 address; for 1-16 S-GW/SGSN addresses)

---

## Serving Node PLMN Identifier

This field contains a serving node (SGSN/SGW/MME/ePDG/HSGW) PLMN Identifier (Mobile Country Code and Mobile Network Code).

The MCC and MNC are coded as described for “Routing Area Identity” in TS 29.060 [75].

**Format**

Octet string

**Length**

3 bytes

---

## Serving Node Type

These fields contain one or several serving node types in the control plane of an S-GW or P-GW, which have been connected during the record. The serving node types listed here are sequentially mapped to the serving node addresses listed in the field “Serving node Address”.

The possible values are:

```

ServingNodeType  ::=  ENUMERATED
{
    sGSN      ( 0 ) ,
    pMIPSGW   ( 1 ) ,
    gTPSGW    ( 2 ) ,
    ePDG      ( 3 ) ,
    hSGW      ( 4 ) ,
    mME       ( 5 )
}

```

**Format**

Sequence of serving Node Type

**Length**

3-48; variable length format (based on number of nodes connected during this period)

## Served PDP PDN Address

This field contains the IP address for the PDN connection (PDP context, IP-CAN bearer). This is a network layer address of type IPv4 or IPv6. The address for each Bearer type is allocated either temporarily or permanently (see “Dynamic Address Flag”). This parameter shall be present except when both the Bearer type is PPP and dynamic address assignment is used.

**Format**

Octet string

**Length**

8 or 20 bytes (depending on v4 or v6 address)

## Served MNNAI

This field contains the Mobile identifier of the served user, in Network Access Identifier (NAI) format based on IMSI, as defined in TS 23.003 [68].

```
SubscriptionID ::= SET
{
    subscriptionIDType [0] SubscriptionIDType,
    subscriptionIDData [1] UTF8String
}
SubscriptionIDType ::= ENUMERATED
{
    END_USER_E164 (0),
    END_USER_IMSI (1),
    END_USER_SIP_URI (2),
    END_USER_NAI (3),
    END_USER_PRIVATE (4)
}
```

The type will be END\_USER\_NAI.

For IMSI: 123456789012345 mcc=123 mnc=045

subscriptionIDData is a string will be

0123456789012345@nai.epc.mnc045.mcc123.3gppnetwork.org

**Format**

Set

**Length**

Variable (Max 62)

## Start Time

This field contains the time when the User IP-CAN session starts at the P-GW, available in the CDR for the first bearer in an IP-CAN session.

## ■ CDR Fields

The timestamp is determined based on the internal timer which has an accuracy of 10ms. Depending on the configured mechanism this is translated into the timestamp which only shows the full seconds.

The format is shown below.

TimeStamp ::= OCTET STRING (SIZE(6))

The contents of this field are a compact form of the UTCTime format containing local time plus an offset to universal time. Binary coded decimal encoding is employed for the digits to reduce the storage and transmission overhead

-- e.g. YYMMDDhhmmssShhmm  
 -- where  
 -- YY = Year 00 to 99 BCD encoded  
 -- MM = Month 01 to 12 BCD encoded  
 -- DD = Day 01 to 31 BCD encoded  
 -- hh = hour 00 to 23 BCD encoded  
 -- mm = minute 00 to 59 BCD encoded  
 -- ss = second 00 to 59 BCD encoded  
 -- S = Sign 0 = "+", "-" ASCII encoded  
 -- hh = hour 00 to 23 BCD encoded  
 -- mm = minute 00 to 59 BCD encoded

**Format**

BCD encoded octet string

**Length**

9 bytes

## Stop Time

This field contains the time when the User IP-CAN session is terminated at the P-GW, available in the CDR for the last bearer in an IP-CAN session.

The timestamp is determined based on the internal timer which has an accuracy of 10ms. Depending on the configured mechanism (ceiling, floor, round-off) this is translated into the timestamp which only shows the full seconds.

The format is shown below.

TimeStamp ::= OCTET STRING (SIZE(6))

The contents of this field are a compact form of the UTCTime format containing local time plus an offset to universal time. Binary coded decimal encoding is employed for the digits to reduce the storage and transmission overhead

-- e.g. YYMMDDhhmmssShhmm  
 -- where  
 -- YY = Year 00 to 99 BCD encoded  
 -- MM = Month 01 to 12 BCD encoded  
 -- DD = Day 01 to 31 BCD encoded  
 -- hh = hour 00 to 23 BCD encoded

-- mm	=	minute 00 to 59	BCD encoded
-- ss	=	second 00 to 59	BCD encoded
-- S	=	Sign 0 = "+", "-"	ASCII encoded
-- hh	=	hour 00 to 23	BCD encoded
-- mm	=	minute 00 to 59	BCD encoded

**Format**

BCD encoded octet string

**Length**

9 bytes

## User Location Information

This field contains the User Location Information as described in TS 29.274 for eGTP case (e.g. CGI, SAI, RAI TAI and ECGI).

The field is provided by the SGSN/MME and transferred to the S-GW/P-GW during the IP-CAN bearer activation/modification.

User Location Information contains the location (e.g. CGI/SAI, ECGI/TAI or RAI) where the UE is located and used during the transfer of the data volume captured by the container (applicable only to the SGW-CDR). This is included in the Traffic data container only if previous container's change condition is "user location change". Note the user location information in SGW-CDR main level contains the location where the UE was when PGW-CDR was opened.

The flags ECGI, TAI, RAI, SAI and CGI in octet 5 indicate if the corresponding fields are present in the IE or not. If one of these flags is set to "0", the corresponding field is not present at all. The respective identities are defined in 3GPP TS 23.003.

The following subclauses specify the coding of the different identities. For each identity, if an Administration decides to include only two digits in the MNC, then bits 5 to 8 of octet 7 are coded as "1111".

**CGI field:**

The Location Area Code (LAC) consists of 2 octets. Bit 8 of Octet 9 is the most significant bit and bit 1 of Octet 10 the least significant bit. The coding of the location area code is the responsibility of each administration. Coding using full hexadecimal representation shall be used.

The Cell Identity (CI) consists of 2 octets. Bit 8 of Octet 11 is the most significant bit and bit 1 of Octet 12 the least significant bit. The coding of the cell identity is the responsibility of each administration. Coding using full hexadecimal representation shall be used.

**SAI field:**

The Location Area Code (LAC) consists of 2 octets. Bit 8 of Octet 9 is the most significant bit and bit 1 of Octet 10 the least significant bit. The coding of the location area code is the responsibility of each administration. Coding using full hexadecimal representation shall be used.

The Service Area Code (SAC) consists of 2 octets. Bit 8 of Octet 11 is the most significant bit and bit 1 of Octet 12 the least significant bit. The SAC is defined by the operator.

**RAI field:**

The Location Area Code (LAC) consists of 2 octets. Bit 8 of Octet 9 is the most significant bit and bit 1 of Octet 10 the least significant bit. The coding of the location area code is the responsibility of each administration. Coding using full hexadecimal representation shall be used.

## ■ CDR Fields

The Routing Area Code (RAC) consists of 2 octets. Only Octet 11 contains the RAC. Octet 12 is coded as all 1's (11111111). The RAC is defined by the operator.

**TAI field:**

The Tracking Area Code (TAC) consists of 2 octets. Bit 8 of Octet 9 is the most significant bit and bit 1 of Octet 10 the least significant bit. The coding of the tracking area code is the responsibility of each administration. Coding using full hexadecimal representation shall be used.

**ECGI field:**

The E-UTRAN Cell Identifier (ECI) consists of 28 bits. Bit 4 of octet 10 is the most significant bit and bit 1 of Octet 11 the least significant bit. The coding of the E-UTRAN cell identifier is the responsibility of each administration. Coding using full hexadecimal representation shall be used.

**Format**

Octet string

**Length**

Varies based on the type of identity

# Chapter 12

## SGSN and Mobility Management Charging Detail Record Field Reference Tables

---

The SGSN provides CDRs that are compliant to the definitions in 3GPP TS32.298. When necessary and required, modifications to the standardized behavior can be implemented in different dictionaries which can be selected in the configuration file. This provides the flexibility to adapt to a customer's needs, e.g. to a legacy post-processing billing interface, while keeping the standard behavior for other needs.

The use of GTPP dictionaries is configurable using the **gtpp dictionary** command in the Context Configuration Mode of the system's Command Line Interface (CLI).

The SGSN provides CDRs that are compliant to the specifications identified in this chapter. When necessary and required, modifications to the standardized behavior can be implemented in different dictionaries which can be selected in the configuration file. This provides the flexibility to adapt to a customer's needs, e.g. to a legacy post-processing billing interface, while keeping the standard behavior for other needs.



**Important:** For more information on custom dictionaries, contact your local service representative.

The category column in all tables use keys described in the following table.

*Table 11. Dictionary Table Key*

Abbreviation	Meaning	Description
M	Mandatory	A field that must be present in the CDR.
C	Conditional	A field that must be present in a CDR if certain conditions are met.
O <sub>M</sub>	Operator Provisionable: Mandatory	A field that an operator has provisioned and must be included in the CDR for all conditions.
O <sub>C</sub>	Operator Provisionable: Conditional	A field that an operator has provisioned that must be included in the CDR if certain conditions are met.

## CDR Fields Supported in S-CDRs

The tables in this section list the S-CDR fields present in the available GTPP dictionaries.

### standard, custom1, custom2, custom4, custom5, custom7, custom9, custom12, custom14 – custom16, custom19 – custom22, custom24 – custom26, custom28 – custom30 Dictionaries

S-CDR fields for TS 32.215 v 4.5.0 (R4).

Field	Category	Description
Record Type	M	SGSN PDP context record.
Network Initiated PDP Context	O <sub>c</sub>	A flag that is present if this is a network-initiated PDP context.
Served IMSI	M	IMSI of the served party.
Served IMEI	O <sub>c</sub>	The IMEI of the ME, if available.
SGSN Address	O <sub>M</sub>	The IP address of the current SGSN.
MS Network Capability	O <sub>M</sub>	The Mobile Station Network Capability.
Routing Area Code (RAC)	O <sub>M</sub>	RAC at the time of “Record Opening Time”.
Location Area Code (LAC)	O <sub>M</sub>	LAC at the time of “Record Opening Time”.
Cell Identifier	O <sub>M</sub>	Cell identity for GSM or Service Area Code (SAC) for UMTS at the time of “Record Opening Time”.
Charging ID	M	PDP context identifier used to identify this PDP context in different records created by GSNs.
GGSN Address Used	M	The control plane IP address of the GGSN currently used. The GGSN address is always the same for an activated PDP context.

Access Point Name Network Identifier	O <sub>M</sub>	The logical name of the connected access point to the external packet data network (network identifier part of APN).
PDP Type	O <sub>M</sub>	PDP type, i.e. IP, PPP, IHOSS:OSP.
Served PDP Address	O <sub>C</sub>	PDP address of the served IMSI, i.e. IPv4 or IPv6. This parameter shall be present except when both the PDP type is PPP and dynamic PDP address assignment is used.
List of Traffic Data Volumes	O <sub>M</sub>	A list of changes in charging conditions for this PDP context, each change is time stamped. Charging conditions are used to categorise traffic volumes, such as per QoS/tariff period. Initial and subsequently changed QoS and corresponding data volumes are listed.
Record Opening Time	M	Time stamp when PDP context is activated in this SGSN or record opening time on subsequent partial records.
Duration	M	Duration of this record in the SGSN.
SGSN Change	C	Present if this is first record after SGSN change.
Cause for Record Closing	M	The reason for closure of the record from this SGSN.
Diagnostics	O <sub>M</sub>	A more detailed reason for the release of the connection.
Record Sequence Number	C	Partial record sequence number in this SGSN. Only present in case of partial records.
Node ID	O <sub>M</sub>	Name of the recording entity.
Local Record Sequence Number	O <sub>M</sub>	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
APN Selection Mode	O <sub>M</sub>	An index indicating how the APN was selected.
Access Point Name Operator Identifier	O <sub>M</sub>	The Operator Identifier part of the APN.
Served MSISDN	O <sub>M</sub>	The primary MSISDN of the subscriber.
Charging Characteristics	M	The Charging Characteristics applied to the PDP context.

## ■ CDR Fields Supported in S-CDRs

System Type	O <sub>c</sub>	Indicates the type of air interface used, e.g. UTRAN. This field is present when either the UTRAN or GERAN air-interface is used. It is omitted when the service is provided by a GSM air interface.
RNC Unsent Downlink Volume	O <sub>c</sub>	The downlink data volume which the RNC has not sent to MS. This field is present when the RNC has provided unsent downlink volume count at RAB release.
Charging Characteristics Selection Mode	O <sub>M</sub>	Holds information about how Charging Characteristics were selected.

## custom3 Dictionary

S-CDR fields for 32.215 v 4.5.0 (R4).

Field	Category	Description
Record Type	M	SGSN PDP context record.
Network Initiated PDP Context	O <sub>c</sub>	A flag that is present if this is a network-initiated PDP context.
Served IMSI	M	IMSI of the served party.
Served IMEI	O <sub>c</sub>	The IMEI of the ME, if available.
SGSN Address	O <sub>M</sub>	The IP address of the current SGSN.
MS Network Capability	O <sub>M</sub>	The mobile station Network Capability.
Routing Area Code (RAC)	O <sub>M</sub>	RAC at the time of “Record Opening Time”.
Location Area Code (LAC)	O <sub>M</sub>	LAC at the time of “Record Opening Time”.
Cell Identifier	O <sub>M</sub>	Cell identity for GSM or Service Area Code (SAC) for UMTS at the time of “Record Opening Time”.
Charging ID	M	PDP context identifier used to identify this PDP context in different records created by GSNs.

GGSN Address Used	M	The control plane IP address of the GGSN currently used. The GGSN address is always the same for an activated PDP context.
Access Point Name Network Identifier	O <sub>M</sub>	The logical name of the connected access point to the external packet data network (network identifier part of APN).
PDP Type	O <sub>M</sub>	PDP type, i.e. IP, PPP, IHOSS:OSP.
Served PDP Address	O <sub>C</sub>	PDP address of the served IMSI, i.e. IPv4 or IPv6. This parameter shall be present except when both the PDP type is PPP and dynamic PDP address assignment is used.
List of Traffic Data Volumes	O <sub>M</sub>	A list of changes in charging conditions for this PDP context, each change is time stamped. Charging conditions are used to categorise traffic volumes, such as per QoS/tariff period. Initial and subsequently changed QoS and corresponding data volumes are listed.
Record Opening Time	M	Time stamp when PDP context is activated in this SGSN or record opening time on subsequent partial records.
Duration	M	Duration of this record in the SGSN.
SGSN Change	C	Present if this is first record after SGSN change.
Cause for Record Closing	M	The reason for closure of the record from this SGSN.
Diagnostics	O <sub>M</sub>	A more detailed reason for the release of the connection.
Record Sequence Number	C	Partial record sequence number in this SGSN. Only present in case of partial records.
Node ID	O <sub>M</sub>	Name of the recording entity.
Local Record Sequence Number	O <sub>M</sub>	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
APN Selection Mode	O <sub>M</sub>	An index indicating how the APN was selected.
Access Point Name Operator Identifier	O <sub>M</sub>	The Operator Identifier part of the APN.
Served MSISDN	O <sub>M</sub>	The primary MSISDN of the subscriber.

## ■ CDR Fields Supported in S-CDRs

Charging Characteristics	M	The Charging Characteristics applied to the PDP context.
System Type	O <sub>c</sub>	Indicates the type of air interface used, e.g. UTRAN. This field is present when either the UTRAN or GERAN air-interface is used. It is omitted when the service is provided by a GSM air interface.
Charging Characteristics Selection Mode	O <sub>M</sub>	Holds information about how Charging Characteristics were selected.
pLMNIdentifier	O <sub>M</sub>	This field defines the PLMN identity (MCC and MNC) as part of the location information. It is present only if the option to include PLMN identity has been set by the operator. This field exists only for “custom3” dictionary.

Notes:

- All IP addresses are encoded in binary format.
- APN name length encoded.
- Context deactivation due to Inter SGSN RAU results in final CDR with cause “SGSN Change” value:18(decimal).
- The QOS parameters are present only if there is a QOS change in the previous container or last container of the previous CDR.

## custom6 Dictionary

S-CDR fields for TS 32.298 v 6.6.0 (R6).

Field	Category	Description
Record Type	M	SGSN PDP context record.
Network Initiated PDP Context	O <sub>c</sub>	A flag that is present if this is a network-initiated PDP context.
Served IMSI	M	IMSI of the served party.
Served IMEI	O <sub>c</sub>	The IMEI of the ME, if available.
SGSN Address	O <sub>M</sub>	The IP address of the current SGSN.

MS Network Capability	O <sub>M</sub>	The mobile station Network Capability.
Routing Area Code (RAC)	O <sub>M</sub>	RAC at the time of “Record Opening Time”.
Location Area Code (LAC)	O <sub>M</sub>	LAC at the time of “Record Opening Time”.
Cell Identifier	O <sub>M</sub>	Cell identity for GSM or Service Area Code (SAC) for UMTS at the time of “Record Opening Time”.
Charging ID	M	PDP context identifier used to identify this PDP context in different records created by GSNs.
GGSN Address Used	M	The control plane IP address of the GGSN currently used. The GGSN address is always the same for an activated PDP context.
Access Point Name Network Identifier	O <sub>M</sub>	The logical name of the connected access point to the external packet data network (network identifier part of APN).
PDP Type	O <sub>M</sub>	PDP type, i.e. IP, PPP, IHOSS:OSP.
Served PDP Address	O <sub>C</sub>	PDP address of the served IMSI, i.e. IPv4 or IPv6. This parameter shall be present except when both the PDP type is PPP and dynamic PDP address assignment is used.
List of Traffic Data Volumes	O <sub>M</sub>	A list of changes in charging conditions for this PDP context, each change is time stamped. Charging conditions are used to categorize traffic volumes, such as per tariff period. Initial and subsequently changed QoS and corresponding data volumes are also listed.
Record Opening Time	M	Time stamp when PDP context is activated in this SGSN or record opening time on subsequent partial records.
Duration	M	Duration of this record in the SGSN.
SGSN Change	C	Present if this is first record after SGSN change.
Cause for Record Closing	M	The reason for closure of the record from this SGSN.
Diagnostics	O <sub>M</sub>	A more detailed reason for the release of the connection.
Record Sequence Number	C	Partial record sequence number in this SGSN. Only present in case of partial records.
Node ID	O <sub>M</sub>	Name of the recording entity.

## ■ CDR Fields Supported in S-CDRs

Local Record Sequence Number	O <sub>M</sub>	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
APN Selection Mode	O <sub>M</sub>	An index indicating how the APN was selected.
Access Point Name Operator Identifier	O <sub>M</sub>	The Operator Identifier part of the APN.
Served MSISDN	O <sub>M</sub>	The primary MSISDN of the subscriber.
Charging Characteristics	M	The Charging Characteristics applied to the PDP context.
RAT Type	O <sub>C</sub>	This field indicates the Radio Access Technology (RAT) type, e.g. UTRAN or GERAN, currently used by the Mobile Station as defined in TS 29.060.
RNC Unsent Downlink Volume	O <sub>C</sub>	The downlink data volume, which the RNC has not sent to MS. This field is present when the RNC has provided unsent downlink volume count at RAB release.
Charging Characteristics Selection Mode	O <sub>M</sub>	Holds information about how Charging Characteristics were selected.
Dynamic Address Flag	O <sub>C</sub>	Indicates whether served PDP address is dynamic, which is allocated during PDP context activation. This field is missing if address is static.

**custom8 Dictionary**

S-CDR fields for TS 32.298 v7.4.0.

Field	Category	Description
Record Type	M	SGSN PDP context record.
Network Initiated PDP Context	O <sub>C</sub>	A flag that is present if this is a network-initiated PDP context.
Served IMSI	M	IMSI of the served party.

Served IMEI	O <sub>c</sub>	The IMEI of the ME, if available.
SGSN Address	O <sub>M</sub>	The IP address of the current SGSN.
MS Network Capability	O <sub>M</sub>	The mobile station Network Capability.
Routing Area Code (RAC)	O <sub>M</sub>	RAC at the time of “Record Opening Time”.
Location Area Code (LAC)	O <sub>M</sub>	LAC at the time of “Record Opening Time”.
Cell Identifier	O <sub>M</sub>	Cell identity for GSM or Service Area Code (SAC) for UMTS at the time of “Record Opening Time”.
Charging ID	M	PDP context identifier used to identify this PDP context in different records created by GSNs.
GGSN Address Used	M	The control plane IP address of the GGSN currently used. The GGSN address is always the same for an activated PDP context.
Access Point Name Network Identifier	O <sub>M</sub>	The logical name of the connected access point to the external packet data network (network identifier part of APN).
PDP Type	O <sub>M</sub>	PDP type, i.e. IP, PPP, IHOSS:OSP.
Served PDP Address	O <sub>c</sub>	PDP address of the served IMSI, i.e. IPv4 or IPv6. This parameter shall be present except when both the PDP type is PPP and dynamic PDP address assignment is used.
List of Traffic Data Volumes	O <sub>M</sub>	A list of changes in charging conditions for this PDP context, each change is time stamped. Charging conditions are used to categorize traffic volumes, such as per tariff period. Initial and subsequently changed QoS and corresponding data volumes are also listed.
Record Opening Time	M	Time stamp when PDP context is activated in this SGSN or record opening time on subsequent partial records.
Duration	M	Duration of this record in the SGSN.
SGSN Change	C	Present if this is first record after SGSN change.
Cause for Record Closing	M	The reason for closure of the record from this SGSN.
Diagnostics	O <sub>M</sub>	A more detailed reason for the release of the connection.

## ■ CDR Fields Supported in S-CDRs

Record Sequence Number	C	Partial record sequence number in this SGSN. Only present in case of partial records.
Node ID	O <sub>M</sub>	Name of the recording entity.
Local Record Sequence Number	O <sub>M</sub>	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
APN Selection Mode	O <sub>M</sub>	An index indicating how the APN was selected.
Access Point Name Operator Identifier	O <sub>M</sub>	The Operator Identifier part of the APN.
Served MSISDN	O <sub>M</sub>	The primary MSISDN of the subscriber.
Charging Characteristics	M	The Charging Characteristics applied to the PDP context.
RAT Type	O <sub>C</sub>	This field indicates the Radio Access Technology (RAT) type, e.g. UTRAN or GERAN, currently used by the Mobile Station as defined in TS 29.060.
RNC Unsent Downlink Volume	O <sub>C</sub>	The downlink data volume, which the RNC has not sent to MS. This field is present when the RNC has provided unsent downlink volume count at RAB release.
Charging Characteristics Selection Mode	O <sub>M</sub>	Holds information about how Charging Characteristics were selected.
Dynamic Address Flag	O <sub>C</sub>	Indicates whether served PDP address is dynamic, which is allocated during PDP context activation. This field is missing if address is static.

Notes:

- Support for Direct Tunnel triggers.
- All IP addresses in Binary format.

## custom10 and custom11 Dictionaries

S-CDR fields for TS 32.215 v4.5.0.

Field	Category	Description
Record Type	M	SGSN PDP context record.
Served IMSI	M	IMSI of the served party.
Served IMEI	O <sub>c</sub>	The IMEI of the ME, if available.
SGSN Address	O <sub>M</sub>	The IP address of the current SGSN.
MS Network Capability	O <sub>M</sub>	The mobile station Network Capability.
Routing Area Code (RAC)	O <sub>M</sub>	RAC at the time of “Record Opening Time”.
Location Area Code (LAC)	O <sub>M</sub>	LAC at the time of “Record Opening Time”.
Cell Identifier	O <sub>M</sub>	Cell identity for GSM or Service Area Code (SAC) for UMTS at the time of “Record Opening Time”.
Charging ID	M	PDP context identifier used to identify this PDP context in different records created by GSNs.
GGSN Address Used	M	The control plane IP address of the GGSN currently used. The GGSN address is always the same for an activated PDP context.
Access Point Name Network Identifier	O <sub>M</sub>	The logical name of the connected access point to the external packet data network (network identifier part of APN).
PDP Type	O <sub>M</sub>	PDP type, i.e. IP, PPP, IHOSS:OSP.
Served PDP Address	O <sub>c</sub>	PDP address of the served IMSI, i.e. IPv4 or IPv6. This parameter shall be present except when both the PDP type is PPP and dynamic PDP address assignment is used.
List of Traffic Data Volumes	O <sub>M</sub>	A list of changes in charging conditions for this PDP context, each change is time stamped. Charging conditions are used to categorise traffic volumes, such as per QoS/tariff period. Initial and subsequently changed QoS and corresponding data volumes are listed.
Record Opening Time	M	Time stamp when PDP context is activated in this SGSN or record opening time on subsequent partial records.
Duration	M	Duration of this record in the SGSN.

## ■ CDR Fields Supported in S-CDRs

SGSN Change	C	Present if this is first record after SGSN change.
Cause for Record Closing	M	The reason for closure of the record from this SGSN.
DiagnosticsSM	O <sub>M</sub>	A more detailed reason for the release of the connection.
Record Sequence Number	C	Partial record sequence number in this SGSN. Only present in case of partial records.
Node ID	O <sub>M</sub>	Name of the recording entity
Local Record Sequence Number	O <sub>M</sub>	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
APN Selection Mode	O <sub>M</sub>	An index indicating how the APN was selected.
Access Point Name Operator Identifier	O <sub>M</sub>	The Operator Identifier part of the APN.
Served MSISDN	O <sub>M</sub>	The primary MSISDN of the subscriber.
Charging Characteristics	M	The Charging Characteristics applied to the PDP context.
System Type	O <sub>C</sub>	Indicates the type of air interface used, e.g. UTRAN. This field is present when either the UTRAN or GERAN air-interface is used. It is omitted when the service is provided by a GSM air interface.
RNC Unsent Downlink Volume	O <sub>C</sub>	The downlink data volume which the RNC has not sent to MS. This field is present when the RNC has provided unsent downlink volume count at RAB release.
Charging Characteristics Selection Mode	O <sub>M</sub>	Holds information about how Charging Characteristics were selected.

Notes:

- No support for choice-id attributes. All IP addresses are plainly encoded in Binary format without any preceding tag value to identify their type. Hence, encoding the attributes in the given order is important.
- Diagnostics has been replaced by DiagnosticsSM which is of type octet string and has size of one byte.
- Charging-id and LRSN have a fixed length as 4bytes.
- Timestamp does not have time-zone offset and is of size 6 bytes.
- Tag value for changeOfCharCondition changed from “0x30” to “0xA0”.
- DynamicAddressflag attribute is not encoded.

- SystemType attribute is not encoded if the value is “GERAN”.
- Context deactivation due to Inter SGSN RAU results in final CDR with cause “SGSN Change” value:18(decimal)

## custom13 Dictionary

S-CDR fields for TS 32.298 v 6.6.0 (R6).

Field	Category	Description
Record Type	M	SGSN PDP context record.
Network Initiated PDP Context	O <sub>C</sub>	A flag that is present if this is a network-initiated PDP context.
Served IMSI	M	IMSI of the served party.
Served IMEI	O <sub>C</sub>	The IMEI of the ME, if available.
SGSN Address	O <sub>M</sub>	The IP address of the current SGSN.
MS Network Capability	O <sub>M</sub>	The mobile station Network Capability.
Routing Area Code (RAC)	O <sub>M</sub>	RAC at the time of “Record Opening Time”.
Location Area Code (LAC)	O <sub>M</sub>	LAC at the time of “Record Opening Time”.
Cell Identifier	O <sub>M</sub>	Cell identity for GSM or Service Area Code (SAC) for UMTS at the time of “Record Opening Time”.
Charging ID	M	PDP context identifier used to identify this PDP context in different records created by GSNs.
GGSN Address Used	M	The control plane IP address of the GGSN currently used. The GGSN address is always the same for an activated PDP context.
Access Point Name Network Identifier	O <sub>M</sub>	The logical name of the connected access point to the external packet data network (network identifier part of APN).
PDP Type	O <sub>M</sub>	PDP type, i.e. IP, PPP, IHOSS:OSP.

## ■ CDR Fields Supported in S-CDRs

Served PDP Address	O <sub>c</sub>	PDP address of the served IMSI, i.e. IPv4 or IPv6. This parameter shall be present except when both the PDP type is PPP and dynamic PDP address assignment is used.
List of Traffic Data Volumes	O <sub>M</sub>	A list of changes in charging conditions for this PDP context, each change is time stamped. Charging conditions are used to categorize traffic volumes, such as per tariff period. Initial and subsequently changed QoS and corresponding data volumes are also listed.
Record Opening Time	M	Time stamp when PDP context is activated in this SGSN or record opening time on subsequent partial records.
Duration	M	Duration of this record in the SGSN.
SGSN Change	C	Present if this is first record after SGSN change.
Cause for Record Closing	M	The reason for closure of the record from this SGSN.
Diagnostics	O <sub>M</sub>	A more detailed reason for the release of the connection.
Record Sequence Number	C	Partial record sequence number in this SGSN. Only present in case of partial records.
Node ID	O <sub>M</sub>	Name of the recording entity.
Record Extensions	O <sub>c</sub>	A set of network operator/manufacturer specific extensions to the record. Conditioned upon the existence of an extension.
Local Record Sequence Number	O <sub>M</sub>	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
APN Selection Mode	O <sub>M</sub>	An index indicating how the APN was selected.
Access Point Name Operator Identifier	O <sub>M</sub>	The Operator Identifier part of the APN.
Served MSISDN	O <sub>M</sub>	The primary MSISDN of the subscriber.
Charging Characteristics	M	The Charging Characteristics applied to the PDP context.
RAT Type	O <sub>c</sub>	This field indicates the Radio Access Technology (RAT) type, e.g. UTRAN or GERAN, currently used by the Mobile Station as defined in TS 29.060.

RNC Unsent Downlink Volume	O <sub>c</sub>	The downlink data volume, which the RNC has not sent to MS. This field is present when the RNC has provided unsent downlink volume count at RAB release.
Charging Characteristics Selection Mode	O <sub>M</sub>	Holds information about how Charging Characteristics were selected.
Dynamic Address Flag	O <sub>c</sub>	Indicates whether served PDP address is dynamic, which is allocated during PDP context activation. This field is missing if address is static.

Notes:

- The IP address is in binary format.
- Context deactivation due to Inter SGSN RAU results in final CDR with cause “SGSN Change” value:18(decimal).

## custom17 Dictionary



**Important:** The custom17 dictionary is supported in Star OS 9.0 releases and later.



**Important:** The custom17 dictionary is ASCII encoded.

Field	Category	Description
<b>Common Part</b>		
Record Type	M	The CDR type.
Potential Duplicate	A	This value is set always Zero. VF-NZ used HDD and there is no possibility of duplicates (Duplicates are applicable only in case when CDRs are transferred over the network).
System Type	A	This value is always set to 3. This indicates the CG Release Version.

## ■ CDR Fields Supported in S-CDRs

Record Sequence Number	A	This field contains a unique incrementing sequence number which CG generates. The number is represented as decimal digits [0...9] and unused space is padded with zeroes (for example, 000000000012).
Served IMSI	M	This field contains an IMSI number. The number is represented as decimal digits [0...9], filled from right and unused space is padded with zeroes (for example, 0234150101667123).
Record Opening Time	M	This field contains the timestamp (GMT) when PDP context is activated or the record opening time of the first partial record. For SMS CDRs, this field contains the Event Time Stamp. For M-CDRs, the field contains the Record Opening.
<b>Partially Common Part</b>		
Served IMEI	C	This field contains the international mobile equipment identity.
NAPI for MSISDN	O	The value for Numbering Plan Indicator, Nature of Address Indicator and Extension Indicator.
Served MSISDN	M	This field contains the MSISDN number of the mobile terminal.
SGSN Address	M	List of SGSN addresses used during this record (IPv6 encoded).
GGSN Address	M	List of GGSN addresses used during this record (IPv6 encoded).
Charging ID	M	This field contains the PDP context identifier. This ID and the GGSN address are then concatenated for unique identification of the same PDP context records.
Access Point Name	M	This field contains a logical Access Point Name (APN), which is used to determine the actual connected access point.
Served PDP Type Org	M	The PDP type defines the end user protocol to be used between the external packet data network and the MS and is divided into Organisation field and a Number field. The PDP Type Organisation is the organisation that is responsible for the PDP Type Number field and the PDP Address format.
Served PDP Type Number	M	PDP type, i.e. IP, PPP, or IHOSS:OSP.
Served PDP Address	M	PDP address of the served IMSI, i.e. IPv4 or IPv6. This parameter shall be present except when both the PDP type is PPP and dynamic PDP address assignment is used (IPv6 encoded).

MS NW Capability	O	The Mobile Station Network Capability.
Location Area Code	O	This field contains the location area at the time of record creation.
Routing Area	O	This field contains the routing area at the time of record creation.
Cell Identity	O	This field contains the cell ID at the time of record creation.
SGSN Change	C	This field indicates that this is the first record after an SGSN change.
Diagnostics 1	O	Procedure code for the SGSN.
Diagnostics 2	O	Initiation code for the SGSN.
Diagnostics 3	O	Process family identifier.
Diagnostics 4	O	Cause for the SGSN error.
Diagnostics 5	O	Internal cause for the SGSN error.
Charging Characteristics	M	The charging characteristics field contains the user's charging characteristics. It describes the type of the CDR. The field can contain a charging type value, added with cell update bit (assuming the cell ID in S-CDR feature is on). For example, the value 20 means that the charging type is Prepaid and cell accuracy charging is used.

**S-CDR Part**

PDP HLR Index	M	The PDP HLR index shows the access information on the server-based prepaid charging. This access information is stored in the HLR. It is retrieved when a user wants to call using the server-based prepaid charging.
Network Initiated PDP Context	C	This flag indicates who initiated the PDP context.
S-Cause for Record Closing	M	This field contains a detailed reason for the release of the record in this SGSN.
S-Complete	A	S-Complete" field is "0" for first and intermediate partial CDR, and "1" for the final CDR (i.e. CDR generated at PDP termination).
S-Uplink	M	Cumulative number of bytes transmitted from the MT since the opening of the PDP context.

## ■ CDR Fields Supported in S-CDRs

S-Downlink	M	Cumulative number of bytes transmitted to the MT since the opening of the PDP context.
S-Quality of Service Requested	M	Quality of Service Requested contains the QoS that the MS wanted at the activation of the PDP context. The first container includes following optional fields: QoS (Quality of Service) Requested (not in G-CDR) and QoS Negotiated. In following containers QoS Negotiated is present if previous change condition is QoS change. Rules for determining R99 attributes from R97/98 attributes are defined in 3rd Generation Partnership Project; QoS Concept and Architecture (3GPP TS 23.107 V4.5.0). Two last bytes are used in SGSN 3.1.
S-Quality of Service Requested	M	Quality of Service Negotiated indicates the applied QoS that the network accepted. Two last bytes are used in SGSN 3.1.
S-Record Opening Time	M	This indicates the record opening local time.
S-Opening Timezone	M	This indicates the record opening time zone.
S-Timestamp	M	This field represents the time when the SGSN closed the last received CDR.
S-Closing Timezone	M	This indicates the record closure time zone.
S-First Sequence Number	C	The “S-First Sequence Number = S-LAST Sequence Number” and these sequence numbers must be incremented for each partial CDRs generated for that PDP context.
S-Last Sequence Number	A	The “S-First Sequence Number = S-LAST Sequence Number” and these sequence numbers must be incremented for each partial CDRs generated for that PDP context.
S-Duration	M	Duration of this record in the SGSN.
<b>G-CDR Part</b>		
G-CDR Part	M	This is not applicable for S-CDRs and always should be padded with zero.
<b>M-CDR Part</b>		

M-CDR Part	M	This is not applicable for S-CDRs and always should be padded with zero.
<b>SMS-CDR Part</b>		
SMS-CDR Part	M	This is not applicable for S-CDRs and always should be padded with zero.

## custom18 Dictionary

S-CDR fields for TS 32.215 v4.5.0.

Field	Category	Description
Record Type	M	SGSN PDP context record.
Network Initiated PDP Context	M	A flag that is present if this is a network-initiated PDP context.
Served IMSI	M	IMSI of the served party.
Served IMEI	M	The IMEI of the ME, if available.
SGSN Address	M	The IP address of the current SGSN.
MS Network Capability	M	The mobile station Network Capability.
Routing Area Code (RAC)	M	RAC at the time of “Record Opening Time”.
Location Area Code (LAC)	M	LAC at the time of “Record Opening Time”.
Cell Identifier	M	Cell identity for GSM or Service Area Code (SAC) for UMTS at the time of “Record Opening Time”.
Charging ID	M	PDP context identifier used to identify this PDP context in different records created by GSNs.
GGSN Address Used	M	The control plane IP address of the GGSN currently used. The GGSN address is always the same for an activated PDP context.

## ■ CDR Fields Supported in S-CDRs

Access Point Name (Ni +OI)	M	The logical name of the connected access point to the external packet data network (network identifier part of APN). This should include NI+OI part. The length is 101 bytes.
PDP Type	M	PDP type, i.e. IP, PPP, IHOSS:OSP.
Served PDP Address	M	PDP address of the served IMSI, i.e. IPv4 or IPv6. This parameter shall be present except when both the PDP type is PPP and dynamic PDP address assignment is used. The length of the field is 16 byte.
List of Traffic Data Volumes	M	A list of changes in charging conditions for this PDP context, each change is time stamped. Charging conditions are used to categorize traffic volumes, such as per tariff period. Initial and subsequently changed QoS and corresponding data volumes are also listed.
Record Opening Time	M	Time stamp when PDP context is activated in this SGSN or record opening time on subsequent partial records.
Duration	M	Duration of this record in the SGSN.
SGSN Change	M	Present if this is first record after SGSN change.
Cause for Record Closing	M	The reason for closure of the record from this SGSN.
Diagnostics 1	M	A more detailed reason for the release of the connection.
Diagnostics 2	M	A more detailed reason for the release of the connection.
Diagnostics 3	M	A more detailed reason for the release of the connection.
Diagnostics 4	M	A more detailed reason for the release of the connection.
Diagnostics 5	M	A more detailed reason for the release of the connection.
Record Sequence Number	M	Partial record sequence number in this SGSN. Only present in case of partial records.
Local Record Sequence Number	M	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
Served MSISDN	M	The primary MSISDN of the subscriber.
Charging Characteristics	M	The Charging Characteristics applied to the PDP context.

CHARGING CHARACTERISTICS PROFILE INDEX	M	Indicates the Charging Profile Index.
PDP HLR Index	M	Indicates the PDP HLR index

Notes:

- The S-CDRs are encoded in fixed length format.
- All fields are mandatory. If not present they should be sent as 0 except in case of IMEI which shall be sent as ffffffffffffffff in case if it is not present.
- The APN name is a combination of OI and NI.
- QOS negotiated/requested fields are present in all containers.
- custom18 supports additional “CELL CHANGE” trigger which generates a partial S-CDR.
- Node-id and Dynamic fields are not encoded in this format.
- The “PDP Type Org” is encoded as 0x01 for IPV4-IETF (As per the 3GPP spec, this field is encoded as 0xf1).
- The “record sequence number” is present in all S-CDRs (Even if a session generates a final SCDR without any interims).

## custom27 dictionary

S-CDR fields for TS 32.215 v 4.5.0 (R4).

Field	Category	Description
Record Type	M	SGSN PDP context record.
Served IMSI	M	IMSI of the served party.
Served IMEI	O <sub>c</sub>	IMEI of the ME, if available.
Served MSISDN	O <sub>M</sub>	The primary MSISDN of the subscriber.
SGSN Address	O <sub>M</sub>	The IP address of the current SGSN.
Charging ID	M	PDP context identifier used to identify this PDP context in different records created by GSNs.

## ■ CDR Fields Supported in S-CDRs

GGSN Address Used	M	The control plane IP address of the GGSN currently used. The GGSN address is always the same for an activated PDP context.
APN Selection Mode	O <sub>M</sub>	An index indicating how the APN was selected.
PDP Type	O <sub>M</sub>	PDP type, i.e. IP, PPP, or IHOSS:OSP.
Served PDP Address	O <sub>C</sub>	PDP address, i.e. IPv4 or IPv6 address. This parameter shall be present except when both the PDP type is PPP and dynamic PDP address assignment is used.
Charging Characteristics	M	The Charging Characteristics applied to the PDP content.
Charging Characteristics Selection Mode	O <sub>M</sub>	Holds information about how Charging Characteristics were selected.
Dynamic Address Flag	O <sub>C</sub>	The presence of this field indicates that the Served PDP Address was dynamically assigned during context activation.
MS Network Capability	O <sub>M</sub>	The Mobile Station Network Capability.
Node ID	M	Name of the recording entity.
Access Point Name Network Identifier	M	The logical name of the connected access point to the external packet data network (network identifier part of APN).
Access Point Name Operator Identifier	M	The Operator Identifier part of the APN.
System Type	O <sub>C</sub>	Indicates the type of air interface used, e.g. UTRAN. This field is present when either the UTRAN or GERAN air-interface is used. It is omitted when the service is provided by a GSM air interface.
Record Opening Time	M	Time stamp when PDP context is activated in this GGSN or record opening time on subsequent partial records.
Duration	M	Duration of this record in the GGSN.
Cause for Record Closing	M	The reason for the release of record from this SGSN.
List of Traffic Data Volumes	M	A list of changes in charging conditions for this PDP context, each time stamped. Charging conditions are used to categorize traffic volumes, such as per tariff period. Initial and subsequently changed QoS and corresponding data values are also listed.

Routing Area Code (RAC)	O <sub>M</sub>	Contains the RA code of the area where the MS is located when the (partial) record is opened.
Location Area Code	O <sub>M</sub>	Contains the Location Area Code of the area where the MS is located when the (partial) record is opened.
Cell Identifier	O <sub>M</sub>	Contains the CI (GSM) or the SAC (WCDMA) of the cell where the MS is located when the S-CDR is opened. The first partial or single S-CDR reports the current cell identifier at PDP context activation. For any subsequent partial S-CDRs, the accuracy of the reported cell identifier is limited to the cell identifier for the last RA update reported by the MS.
SGSN Change	C	Indicate that this is the first record after an inter-SGSN routing area update in new SGSN and an intra-SGSN inter-system change.
Record Sequence Number	C	Partial record sequence number, only present in case of partial records.
Local Record Sequence Number	M	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.

Notes:

- The indefinite length ASN encoding is used. i.e no length part which indicates the total length of CDR.
- All IP addresses are in binary format.
- All bools are encoded as 0x01 (In ASN STD 3GPP they are encoded as 0xff).
- RNCUnsent Volume field is not present.
- The QOS length should limited to max of 12 bytes irrespective of what was requested/negotiated.
- ISRAU 'cause for record closure' is the SGSN Change.
- IMEISV shall be sent if available else IMEI shall be sent.
- System Type field is present in S-CDR only if access type is UTRAN.
- In the case of intra-sgsn-inter-system change (2G<->3G handover within same box), the cause for record closure is 'SGSN Change'.
- The fields should be sent in same order as per the table.

# CDR Fields Supported in S-SMO-CDRs

The tables in this section list the S-SMO-CDR fields present in the available GTPP dictionaries.

## standard, custom1 – custom30 Dictionaries

For TS 32.215 v4.5.0 (R4) / 32.298 v7.4.0 (R7)

Field	Category	Description
Record Type	M	SGSN Mobile Originated SMS.
Served IMSI	M	The IMSI of the subscriber.
Served IMEI	O <sub>C</sub>	The IMEI of the ME, if available.
Served MSISDN	O <sub>M</sub>	The primary MSISDN of the subscriber.
MS Network Capability	O <sub>M</sub>	The mobile station network capability.
Service Centre	O <sub>M</sub>	The address (E.164) of the SMS-service centre.
Recording Entity	O <sub>M</sub>	The E.164 number of the SGSN.
Location Area Code	O <sub>M</sub>	The Location Area Code from which the message originated.
Routing Area Code	O <sub>M</sub>	The Routing Area Code from which the message originated.
Cell Identifier	O <sub>M</sub>	The Cell Identity for GSM or Service Area Code (SAC) for UMTS from which the message originated.
Message Reference	M	A reference provided by the MS uniquely identifying this message.
Event Time Stamp	M	The time at which the message was received by the SGSN from the subscriber.
SMS Result	C	The result of the attempted delivery if unsuccessful.

Record Extensions	O <sub>c</sub>	A set of network operator/ manufacturer specific extensions to the record. Conditioned upon the existence of an extension.
Node ID	O <sub>M</sub>	Name of the recording entity.
Local Record Sequence Number	O <sub>M</sub>	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
Charging Characteristics	M	The Charging Characteristics flag set used by the SGSN.
System Type	O <sub>c</sub>	Indicates the type of air interface used, e.g. UTRAN. This field is present when either the UTRAN or GERAN air-interface is used. It is omitted when the service is provided by a GSM air interface.
Destination Number	O <sub>M</sub>	The destination short message subscriber number.
Charging Characteristics Selection Mode	O <sub>M</sub>	Holds information about how Charging Characteristics were selected.



**Important:** Based on TS 32.215 v4.5.0 (R4) or TS 32.298 v7.4.0 (R7). The only difference is that from R6 onwards the “System Type” field is renamed to “RAT Type”.

# CDR Fields Supported in S-SMT-CDRs

The tables in this section list the S-SMT-CDR fields present in the available GTPP dictionaries.

## standard, custom1 – custom30 Dictionaries

For TS 32.215 v4.5.0 (R4) / TS 32.298 v7.4.0 (R7).

Field	Category	Description
Record Type	M	SGSN Mobile Terminated SMS.
Served IMSI	M	The IMSI of the subscriber.
Served IMEI	O <sub>c</sub>	The IMEI of the ME, if available.
Served MSISDN	O <sub>M</sub>	The primary MSISDN of the subscriber.
MS Network Capability	O <sub>M</sub>	The mobile station network capability.
Service Centre	O <sub>M</sub>	The address (E.164) of the SMS-service centre.
Recording Entity	O <sub>M</sub>	The E.164 number of the SGSN.
Location Area Code	O <sub>M</sub>	The Location Area Code to which the message was delivered.
Routing Area Code	O <sub>M</sub>	The Routing Area Code to which the message was delivered.
Cell Identifier	O <sub>M</sub>	The Cell Identity for GSM or Service Area Code (SAC) for UMTS to which the message was delivered.
Event Time Stamp	M	Delivery time stamp, time at which message was sent to the MS by the SGSN.
SMS Result	C	The result of the attempted delivery if unsuccessful.
Record Extensions	O <sub>c</sub>	A set of network operator/manufacturer specific extensions to the record. Conditioned upon the existence of an extension.

Node ID	O <sub>M</sub>	Name of the recording entity.
Local Record Sequence Number	O <sub>M</sub>	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
Charging Characteristics	M	The Charging Characteristics flag set used by the SGSN.
System Type	O <sub>C</sub>	Indicates the type of air interface used, e.g. UTRAN. This field is present when either the UTRAN or GERAN air-interface is used. It is omitted when the service is provided by a GSM air interface.
Charging Characteristics Selection Mode	O <sub>M</sub>	Holds information about how Charging Characteristics were selected.



**Important:** Based on TS 32.215 v4.5.0 (R4) / TS 32.298 v7.4.0 (R7). No change in fields from R4 to R7.

## CDR Fields Supported in M-CDR

The tables in this section list the M-CDR fields present in the available GTPP dictionaries.

### standard, custom1 – custom5, custom7, custom9 – 12, and custom14 – custom30 Dictionaries

For TS 32.215 v 4.5.0 (R4).

Field	Category	Description
Record Type	M	SGSN mobility management record.
Served IMSI	M	IMSI of the MS.
Served IMEI	O <sub>c</sub>	The IMEI of the ME, if available.
SGSN Address	O <sub>M</sub>	The IP address of the current SGSN.
MS Network Capability	O <sub>M</sub>	The mobile station network capability.
Routing Area Code	O <sub>M</sub>	Routing Area at the time of the Record Opening Time.
Local Area Code	O <sub>M</sub>	Location Area Code at the time of Record Opening Time.
Cell Identifier	O <sub>M</sub>	The Cell Identity for GSM or Service Area Code (SAC) for UMTS at the time of the Record Opening Time.
Change of Location	O <sub>c</sub>	A list of changes in Routing Area Code, each with a time stamp. This field is not required if partial records are generated when the location changes.
Record Opening Time	M	Timestamp when MS is attached to this SGSN or record opening time on following partial record.
Duration	O <sub>M</sub>	Duration of this record.
SGSN Change	C	Present if this is first record after SGSN change.

Cause for Record Closing	M	The reason for the closure of the record in this SGSN.
Diagnostics	O <sub>M</sub>	A more detailed reason for the release of the connection.
Record Sequence Number	C	Partial record sequence number in this SGSN; only present in case of partial records.
Node ID	O <sub>M</sub>	Name of the recording entity.
Record Extensions	O <sub>C</sub>	A set of network operator/manufacturer specific extensions to the record. Conditioned upon the existence of an extension.
Local Record Sequence Number	O <sub>M</sub>	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
Served MSISDN	O <sub>M</sub>	The primary MSISDN of the subscriber.
Charging Characteristics	M	The Charging Characteristics used by the SGSN.
System Type	O <sub>C</sub>	Indicates the type of air interface used, e.g. UTRAN. This field is present when either the UTRAN or GERAN air-interface is used. It is omitted when the service is provided by a GSM air interface.
Charging Characteristics Selection Mode	O <sub>M</sub>	Holds information about how Charging Characteristics were selected.

## custom6 and custom13 Dictionaries

For TS 32.298 v6.6.0.

Field	Category	Description
Record Type	M	SGSN mobility management record.
Served IMSI	M	IMSI of the MS.
Served IMEI	O <sub>C</sub>	The IMEI of the ME, if available.
SGSN Address	O <sub>M</sub>	The IP address of the current SGSN.

## ■ CDR Fields Supported in M-CDR

MS Network Capability	O <sub>M</sub>	The mobile station network capability.
Routing Area Code	O <sub>M</sub>	Routing Area at the time of the Record Opening Time.
Local Area Code	O <sub>M</sub>	Location Area Code at the time of Record Opening Time.
Cell Identifier	O <sub>M</sub>	The Cell Identity for GSM or Service Area Code (SAC) for UMTS at the time of the Record Opening Time.
Change of Location	O <sub>C</sub>	A list of changes in Routing Area Code, each with a time stamp. This field is not required if partial records are generated when the location changes.
Record Opening Time	M	Timestamp when MS is attached to this SGSN or record opening time on following partial record.
Duration	O <sub>M</sub>	Duration of this record.
SGSN Change	C	Present if this is first record after SGSN change.
Cause for Record Closing	M	The reason for the closure of the record in this SGSN.
Diagnostics	O <sub>M</sub>	A more detailed reason for the release of the connection.
Record Sequence Number	C	Partial record sequence number in this SGSN; only present in case of partial records.
Node ID	O <sub>M</sub>	Name of the recording entity.
Record Extensions	O <sub>C</sub>	A set of network operator/manufacturer specific extensions to the record. Conditioned upon the existence of an extension.
Local Record Sequence Number	O <sub>M</sub>	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
Served MSISDN	O <sub>M</sub>	The primary MSISDN of the subscriber.
Charging Characteristics	M	The Charging Characteristics used by the SGSN.
RAT Type	O <sub>C</sub>	This field indicates the Radio Access Technology (RAT) type, e.g. UTRAN or GERAN, currently used by the Mobile Station as defined in TS 29.060.

Charging Characteristics Selection Mode	O <sub>M</sub>	Holds information about how Charging Characteristics were selected.
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**Important:** The only difference between R4 and R6 is that the “System Type” field is renamed to “Rat Type”.

## custom8 Dictionary

For TS 32.298 v7.4.0.

Field	Category	Description
Record Type	M	SGSN mobility management record.
Served IMSI	M	IMSI of the MS.
Served IMEI	O <sub>C</sub>	The IMEI of the ME, if available.
SGSN Address	O <sub>M</sub>	The IP address of the current SGSN.
MS Network Capability	O <sub>M</sub>	The mobile station network capability.
Routing Area Code	O <sub>M</sub>	Routing Area at the time of the Record Opening Time.
Local Area Code	O <sub>M</sub>	Location Area Code at the time of Record Opening Time.
Cell Identifier	O <sub>M</sub>	The Cell Identity for GSM or Service Area Code (SAC) for UMTS at the time of the Record Opening Time.
Cell PLMN Id	O <sub>M</sub>	The MCC and MNC of the Cell at the time of Record Opening Time.
Change of Location	O <sub>C</sub>	A list of changes in Routing Area Code including MCC and MNC, each with a time stamp. This field is not required if partial records are generated when the location changes.
Record Opening Time	M	Timestamp when MS is attached to this SGSN or record opening time on following partial record.

## ■ CDR Fields Supported in M-CDR

Duration	$O_M$	Duration of this record.
SGSN Change	C	Present if this is first record after SGSN change.
Cause for Record Closing	M	The reason for the closure of the record in this SGSN.
Diagnostics	$O_M$	A more detailed reason for the release of the connection.
Record Sequence Number	C	Partial record sequence number in this SGSN; only present in case of partial records.
Node ID	$O_M$	Name of the recording entity.
Record Extensions	$O_c$	A set of network operator/manufacturer specific extensions to the record. Conditioned upon the existence of an extension.
Local Record Sequence Number	$O_M$	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
Served MSISDN	$O_M$	The primary MSISDN of the subscriber.
Charging Characteristics	M	The Charging Characteristics used by the SGSN.
RAT Type	$O_c$	This field indicates the Radio Access Technology (RAT) type, e.g. UTRAN or GERAN, currently used by the Mobile Station as defined in TS 29.060.
Charging Characteristics Selection Mode	$O_M$	Holds information about how Charging Characteristics were selected.

Notes:

- New field “cell PLMN- ID” added.
- All IP addresses is in binary format.

# Chapter 13

## S-CDR Field Descriptions

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This chapter lists and describes the fields supported by the system for use in SGSN Charging Data Records (S-CDRs). The following information is provided for each field:

- **Description:** The field's description.
- **Format:** The field's data format.
- **Length:** The field's size, in bytes.

Based on the following standards:

- 3GPP TS 32.298 V6.5.0 (2006-09): 3rd Generation Partnership Project; Technical Specification Group Service and System Aspects; Telecommunication management; Charging management; Charging Data Record (CDR) parameter description (Release 6)
- 3GPP TS 32.251 V6.10.0 (2007-06): 3rd Generation Partnership Project; Group Services and System Aspects; Telecommunication management; Charging management; Packet Switched (PS) domain charging (Release 6)

Also, refer the *SGSN and Mobility Management Charging Detail Record Field Reference Tables* chapter for information on CDR fields supported in S-CDRs.

# CDR Fields

## Access Point Name Network Identifier

The network identifier portion of the Access Point Name (APN). The APN typically corresponds to a registered Internet domain name and represents the external packet data network (PDN).

**Format**

IA5 String

**Length**

1–65 Bytes

## Access Point Operator Identifier

The Operator Identifier part of the APN.

**Format**

IA5 String

**Length**

1–37 Bytes

## APN Selection Mode

An index indicating how the APN was selected.

The following APN selection mode indexes are possible:

- 0: MS or network provided APN, subscribed verified
- 1: MS provided APN, subscription not verified
- 2: Network provided APN, subscription not verified

**Format**

Unsigned Integer

**Length**

1 Byte

## CAMEL Information

Set of CAMEL information related to PDP context. This field is present if CAMEL Charging Information is received by the HLR in ISD message.

**Format**

Octet String

**Length**

N/A

## Cause for Record Closing

The reason the record is released from the SGSN.

Some of the possible reasons are:

- **normalRelease** (0): The PDP context was terminated normally through a PDP context release (end of context or SGSN change) or a GPRS detach.
- **abnormalRelease** (4): The PDP context was abnormally terminated.
- **volumeLimit** (16): The CDR is released due to exceeding volume limit.
- **timeLimit** (17): The CDR is released due to exceeding time limit.
- **maxChangeCond** (19): The CDR is released due to exceeding the changed condition limit.
- **managementIntervention** (20): The record was closed due to an O&M request.
- **intraSGSNIintersystemChange** (21): The CDR is released when MS moves from 3G<->2G and vice versa within the same SGSN.
- **Partial Record Generation**: A partial CDR was generated for reasons such as the reaching of data volume or time (duration) limits, or reaching the maximum number of charging condition changes, or **intraSGSNIintersystemChange** change.

**Format**

Unsigned Integer

**Length**

1 Byte

## Cell Identifier

Cell identity for GSM or Service Area Code (SAC) for UMTS at “Record Opening Time”.

**Format**

Octet String

**Length**

2 Bytes

## Charging Characteristics

Lists the charging characteristics applied to the PDP context.

The SGSN can accept charging characteristics from the HLR or use its own. SGSN-configured charging characteristics are specified as part of the operator policy and are applied to subscriber PDP contexts through SGSN-Operator-Policy templates.

**Format**

Hex Value Octet String

**Length**

2 Bytes

## Charging Characteristics Selection Mode

The charging characteristic (CC) type that the SGSN applied to the CDR. The following values for this field are supplied:

- Home Default: SGSN configured charging characteristics for home subscribers are used. Home subscribers are those that belong to the same PLMN as the one on which the GGSN is located.
- Visiting Default: SGSN configured charging characteristics for visiting subscribers are used. Visiting subscribers are those that belong to a different PLMN than the one on which the GGSN is located.
- Roaming Default: SGSN configured charging characteristics for roaming subscribers are used. Roaming subscribers are those that are serviced by an SGSN belonging to a different PLMN than the one on which the GGSN is located.
- subscriptionSpecific: This CC will be applied to S-CDR only if aPNSpecific CC is absent.
- aPNSpecific: For S-CDR priority will be given to aPNSpecific Charging Characteristics Selection mode. The aPNSpecific mode is from HLR (ISD Message).

**Format**

Enumerated Integer

**Length**

1 Byte

## Charging ID

The PDP context identifier used to identify the PDP context in different records created by GSNs.

**Format**

Unsigned Integer

**Length**

1–4 Bytes

## Diagnostics

This field is included in the CDR when the PDP context is released. This field is supported in G-CDRs but not for eG-CDRs.

It will contain one of the following values:

- 36: If the SGSN sends Delete PDP Context request
- 38: If the SGSN sends Delete PDP Context request due to GTP-C/U echo timeout with SGSN
- 26: If the SGSN sends Delete PDP Context request for any other reason

**Format**

Unsigned Integer

**Length**

1 Byte

## Duration

The time period, in seconds, that the record existed in the SGSN. It is the duration from “Record Opening Time” to record closure. For partial records, only the duration of the individual partial record is provided.

**Format**

Unsigned Integer

**Length**

1–5 Bytes

## Dynamic Address Flag

The presence of this field indicates that the **Served PDP Address** was dynamically assigned during context activation.

**Format**

Boolean

**Length**

1 Byte

## GGSN Address

The binary-represented IPv4 address of the GGSN used.

**Format**

Hex Value Octet String

**Length**

4 Bytes

## List of Traffic Data Volumes

A list of the changes that occurred in the charging conditions for this PDP context.

The list will include one or more containers each including the following fields:

- QoS negotiated: Quality of service (QoS) has been negotiated. The initial and final corresponding data values are listed. This is only added for the first container and the container after a QoS change.
- Uplink volume: The number of octets (uncompressed) received from the MS. The initial and final corresponding data values are listed.
- Downlink volume: The number of octets (uncompressed) transmitted to the MS. The initial and final corresponding data values are listed.
- Change Condition: Identifies the reason that the container was closed such as tariff time change, QoS change, or closing of the CDR.
- Change Time: A timestamp identifying the time at which the volume container or the CDR closed.

For GPRS, data volumes are in octets above the GTP layer and are separated for uplink and downlink traffic. In UMTS, data volumes are in octets above the GTP-U layer and are separated for uplink and downlink traffic.

**Format**

- QoS negotiated: Octet String

## ■ CDR Fields

- Uplink volume: Integer
- Downlink volume: Integer
- Change Condition: Integer
- Change Time: BCD Encoded Octet String

**Length**

- QoS negotiated: 12 Bytes
- Uplink volume: 4 Bytes
- Downlink volume: 4 Bytes
- Change Condition: 1 Byte
- Change Time: 9 Bytes

---

## Local Record Sequence Number

Consecutive record number created by the node. For a Node ID, this number is allocated sequentially for each CDR. This along with a Node ID uniquely identifies a CDR.

**Format**

Unsigned Integer

**Length**

1–4 Bytes

---

## Location Area Code (LAC)

Indicates the LAC at “Record Opening Time”.

**Format**

Octet String

**Length**

2 Bytes

---

## MS Network Capability

The mobile station network capability.

**Format**

Octet String

**Length**

1–8 Bytes

---

## Network Initiated PDP Context

The presence of this field indicates that the PDP context was initiated by the network.

**Format**

Boolean

**Length**

1 Byte

---

## Node ID

The identifier string for the SGSN that had generated the CDR. Node ID along with local record sequence number uniquely identifies a CDR.

**Format**

Octet String

**Length**

1–20 Bytes

---

## PDP Type

The PDP context type. The PDP types supported by the SGSN are IP or PPP (including IHOSS:OSP).

**Format**

Hex Value Octet String

**Length**

2 Bytes

---

## Radio Access Technology (RAT) Type

The SGSN may include the RAT Type IE along with User Location Information IE, and MS Time Zone IE if they are available. The RAT Type IE is not included for the MS-initiated PDP Context Modification procedure.

**Format**

Integer (1-255).

**Length**

1 Byte

---

## Record Extensions

A set of network operator or manufacturer specific extensions that may be added to the record if provided. It is used for reporting flows and volumes consumed, and also for passing key information about the session into the downstream charging systems.



**Important:** This field is customer specific.

---

## Record Opening Time

The timestamp at which the PDP context was activated on the SGSN.

## ■ CDR Fields

**Format**

BCD Encoded Octet String

**Length**

9 Bytes

---

## Record Sequence Number

A running sequence number used to link partial records generated by the SGSN for a specific PDP context (characterized with the same Charging ID and SGSN address pair). This field is only present in case of partial records.

**Format**

Unsigned Integer

**Length**

1–5 Bytes

---

## Record Type

Indicates the SGSN PDP context record type.

**Format**

Integer

**Length**

1–4 Bytes

---

## RNC Unsent Downlink Volume

The downlink data volume that the RNC has not sent to MS. This field is present when the RNC has provided unsent downlink volume count at RAB release.

**Format**

Unsigned Integer

**Length**

1–5 Bytes

---

## Routing Area Code (RAC)

Indicates the RAC at “Record Opening Time”.

**Format**

Octet String

**Length**

1 Byte

---

## Served IMEI

The International Mobile Equipment Identity (IMEI) of the MS, if available.

**Format**

BCD Encoded Octet String

**Length**

8 Bytes

---

## Served IMSI

The International Mobile Subscriber Identity (IMSI) of the MS. The IMSI is formatted in accordance with 3GPP TS 23.003. This will be present if the Anonymous Access Indicator is FALSE or not supplied.

**Format**

BCD Encoded Octet String

**Length**

3–8 Bytes

---

## Served PDP Address

The binary-represented IPv4 address associated with the PDP context for the CDR. This address could either be static or dynamically assigned.

**Format**

Hex Value Octet String

**Length**

4 bytes for IPv4 address

16 bytes for IPv6 address

---

## Served MSISDN

The primary Mobile Station (MS) ISDN number (MSISDN) of the subscriber.

**Format**

BCD Encoded Octet String

**Length**

1–9 Bytes

---

## SGSN Address

The SGSN IPv4 addresses (binary-represented) used over the duration of the CDR. The address(es) can be either user or control-plane addresses.

**Format**

Hex Value Octet String

**Length**

4 Bytes per address

---

## SGSN Change

Present if this is first record after SGSN change.

**Format**

Boolean

**Length**

1 Byte

# Chapter 14

## SGW-CDR Field Reference Tables

---

This chapter provides reference tables for the CDR fields reported as part of S-GW CDRs (SGW-CDRs) generated by the system.

A complete list of supported CDR fields is provided in the *SGW-CDR Field Descriptions* chapter of this reference guide.

The specific CDRs reported in SGW-CDRs and their encoding are user-selectable via GTPP dictionaries. The use of GTPP dictionaries is configurable using the **gtpo dictionary** command in the Context Configuration Mode of the system's Command Line Interface (CLI).

This section provides information on the fields reported in SGW-CDRs for the GTPP dictionaries.



**Important:** For more information on custom dictionaries, contact your local service representative.

The category column in all tables use keys described in the following table.

**Table 12. Dictionary Table Key**

Abbreviation	Meaning	Description
M	Mandatory	A field that must be present in the CDR.
C	Conditional	A field that must be present in a CDR if certain conditions are met.
O <sub>M</sub>	Operator Provisionable: Mandatory	A field that an operator has provisioned and must be included in the CDR for all conditions.
O <sub>C</sub>	Operator Provisionable: Conditional	A field that an operator has provisioned that must be included in the CDR if certain conditions are met.

# CDR Fields Supported in SGW-CDRs

The tables in this section list the SGW-CDR fields present in the available GTPP dictionaries.

## custom6, custom11, and custom24 Dictionaries

For custom6 and custom24 dictionaries, CDR fields are based on 3GPP TS 32.298 v8.7.0 and 3GPP TS 32.251 v8.8.0.

For the custom11 dictionary, CDR fields are based on 3GPP TS 32.298 v8.5.0 and 3GPP TS 32.251 v8.6.0.

Field	Category	Description
Record Type	M	S-GW IP CAN bearer record
Served IMSI	M	IMSI of the served party (if Anonymous Access Indicator is FALSE or not supplied)
Served IMEISV	O <sub>c</sub>	IMEISV of the ME, if available
S-GW Address used	M	The control plane IP address of the S-GW used.
Charging ID	M	IP CAN bearer identifier used to identify this IP CAN bearer in different records created by PCNs
PDN Connection Id	O <sub>M</sub>	The PDN connection (IP-CAN session) identifier to identify different records belonging to same PDN connection.
Serving Node Address	M	List of serving node control plane IP addresses (e.g. SGSN, MME, etc.) used during this record.
Serving Node Type	M	List of serving node types in control plane. The serving node types listed here map to the serving node addresses listed in the field "Serving node Address" in sequence.
S-GW Change	O <sub>c</sub>	Present if this is the first record after S-GW change.
PGW PLMN Identifier	O <sub>c</sub>	PLMN identifier (MCC MNC) of the PGW used.
Access Point Name Network Identifier	O <sub>M</sub>	The logical name of the connected access point to the external packet data network (network identifier part of APN).

PDP/PDN Type	O <sub>M</sub>	Indicates PDN type (i.e IPv4, IPv6 or IPv4v6).
Served PDP/PDN Address	O <sub>C</sub>	IP address allocated for the PDP context / PDN connection, i.e. IPv4 or IPv6, if available.
Dynamic Address Flag	O <sub>C</sub>	Indicates whether served PDP/PDN address is dynamic, which is allocated during IP CAN bearer activation, initial attach (E-UTRAN or over S2x) and UE requested PDN connectivity. This field is missing if address is static.
List of Traffic Data Volumes	O <sub>M</sub>	A list of changes in charging conditions for this QCI/ARP pair, each change is time stamped. Charging conditions are used to categorize traffic volumes, such as per tariff period. Initial and subsequently changed QoS and corresponding data values are also listed. Refer to the List of Data Traffic Volumes table in this chapter.
Record Opening Time	M	Time stamp when IP CAN bearer is activated in this S-GW or record opening time on subsequent partial records.
MS Time Zone	O <sub>C</sub>	Contains the MS Time Zone the MS is currently located as defined in TS 29.060 [203], if available.
Duration	M	Duration of this record in the S-GW.
Cause for Record Closing	M	The reason for the release of record from this S-GW.
Diagnostics	O <sub>M</sub>	A more detailed reason for the release of the connection.
Record Sequence Number	C	Partial record sequence number, only present in case of partial records.
Node ID	O <sub>M</sub>	Name of the recording entity.
Record Extensions	O <sub>C</sub>	A set of network operator/manufacturer specific extensions to the record. Conditioned upon the existence of an extension.
Local Record Sequence Number	O <sub>M</sub>	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
APN Selection Mode	O <sub>M</sub>	An index indicating how the APN was selected.
Served MSISDN	O <sub>M</sub>	The primary MSISDN of the subscriber.

## ■ CDR Fields Supported in SGW-CDRs

User Location Information	O <sub>c</sub>	Contains the User Location Information of the MS as defined in TS 29.060 [203] for GPRS case, and in TS 29.274 [210] for EPC case, if available.
Charging Characteristics	M	The Charging Characteristics applied to the IP CAN bearer.
Charging Characteristics Selection Mode	O <sub>M</sub>	Information about how Charging Characteristics were selected.
IMS Signalling Context	O <sub>c</sub>	Included if the IM-CN Subsystem Signalling Flag is set. IP CAN bearer is used for IMS signalling.
P-GW Address used.	O <sub>c</sub>	The P-GW IP Address for the Control Plane.
Serving Node PLMN Identifier	O <sub>c</sub>	Serving node PLMN Identifier (MCC and MNC) used during this record, if available.
RAT Type	O <sub>c</sub>	Indicates the Radio Access Technology (RAT) type currently used by the Mobile Station, when available. This RAT type is defined in TS 29.060 [204] for GTP case, in TS 29.274 [210] for eGTP case and in TS 29.275 [211] for PMIP case.
Start Time	O <sub>c</sub>	The time when User IP-CAN session starts, available in the CDR for the first bearer in an IP-CAN session.
Stop Time	O <sub>c</sub>	The time when User IP-CAN session is terminated, available in the CDR for the last bearer in an IP-CAN session .

Notes:

- custom11 and custom24 dictionaries: All IP addresses are encoded in binary format.
- custom6 dictionary: All IP addresses are in ASCII format.

## List of Traffic Data Volumes

Traffic Data Volume	Category	Description
Change Of Charging Condition	M	Each traffic volume container contains details related to a charging condition as described in the following subsections. A new container is usually created for a QoS change and for tariff changes.

Traffic Data Volume	Category	Description
Data Volume GPRS Uplink	M	<p>The Data Volume GPRS Uplink field is a part of the ChangeOfCharCondition element in the List of Traffic Volumes. It includes the number of octets received in the uplink direction during the timeframe specified by the container. For each new container, the counter is reset and does not accumulate.</p> <p>The data counted already includes the IP PDP bearer protocols i.e. IP or PPP.</p>
Data volume GPRS Downlink	M	<p>The Data Volume GPRS Downlink field is a part of the ChangeOfCharCondition element in the List of Traffic Volumes. It includes the number of octets transmitted in the downlink direction during the timeframe specified by the container. For each new container, the counter is reset and does not accumulate.</p> <p>The data counted already includes the IP PDP bearer protocols i.e. IP or PPP.</p>
Change Condition	M	<p>The Change Condition field is part of the ChangeOfCharCondition element in the List of Traffic Volumes. It defines the reason for closing the container.</p>
Change time	M	<p>The Change Time field is part of the ChangeOfCharCondition element in the List of Traffic Volumes. It provides the local time when a change condition (e.g. record closure) occurred and the container was closed.</p>
User Location Information	O	<p>This field contains the User Location Information as described in TS 29.274 for eGTP case (e.g. CGI, SAI, RAI TAI and ECGI).</p> <p>The field is provided by the SGSN/MME and transferred to the S-GW/P-GW during the IP-CAN bearer activation/modification.</p> <p>User Location Information contains the location (e.g. CGI/SAI, ECGI/TAI or RAI) where the UE is located and used during the transfer of the data volume captured by the container (applicable only to the SGW-CDR). This is included in the Traffic data container only if previous container's change condition is "user location change". Note the user location information in SGW-CDR main level contains the location where the UE was when CDR was opened.</p>
EPC Qos Requested	O	<p>In case of IP-CAN bearer specific container this contains authorized QoS for the IP-CAN bearer. First container for each QCI/ARP pair includes this field. In following containers this field is present if previous change condition is "QoS change". This field is applicable only in SGW-CDR.</p>



# Chapter 15

## SGW-CDR Field Descriptions

---

This chapter lists and describes the fields supported by the system for use in S-GW charging data records (SGW-CDRs).

The following information is provided for each field:

- **Description:** The field's description.
- **Format:** The field's data format.
- **Length:** The field's size, in bytes.

All SGW-CDRs are encoded using the ASN.1 format and are sent to the charging gateway function (CGF) using the GPRS Tunneling Protocol Prime (GTPP) as defined in the following standards:

- 3GPP TS 29.060
- 3GPP TS 32.015
- 3GPP TS 32.215
- 3GPP TS 32.251
- 3GPP TS 32.298 v 8.5.0 (SGW-CDRs)

Also see the *SGW-CDR Field Reference Tables* chapter for information on CDR fields supported in SGW-CDRs.



**Important:** The behavior for several of the fields supported in CDRs can be modified. For more information, refer to the `gtpp attributes` command in the *Command Line Interface Reference*.

# CDR Fields

## Access Point Name Network Identifier

This field contain the Network Identifier part of the Access Point Name (APN). This APN is sent to the S-GW by the MME and is relayed to the P-GW in the Create PDP Context Request message.

**Format**

IA5string

**Length**

1-63 bytes

## APN Selection Mode

An index indicating how the APN was selected.

The following APN selection mode indexes are possible:

- 0: MS or network provided APN, subscribed verified
- 1: MS provided APN, subscription not verified
- 2: Network provided APN, subscription not verified.

**Format**

Enumerated

**Length**

1 byte

## Cause for Record Closing

This field contains a reason for the closure of the CDR.

Supported values:

```
--  
-- In PGW-CDR and SGW-CDR the value servingNodeChange is used for  
partial record  
-- generation due to Serving Node Address list Overflow  
-- In SGSN servingNodeChange indicates the SGSN change  
--  
-- LCS related causes belong to the MAP error causes acc. TS 29.002  
--
```

```

-- cause codes 0 to 15 are defined 'CauseForTerm' (cause for
termination)

--

normalRelease          ( 0 ) ,
abnormalRelease        ( 4 ) ,
volumeLimit            ( 16 ) ,
timeLimit              ( 17 ) ,
servingNodeChange      ( 18 ) ,
maxChangeCond          ( 19 ) ,
managementIntervention ( 20 ) ,
rATChange              ( 22 ) ,
mSTimeZoneChange       ( 23 ) ,

```

**Format**

Integer

**Length**

1 byte

---

## Charging Characteristics

Lists the charging characteristics applied to the PDP context by the S-GW. The S-GW shall accept the charging characteristics from the MME or use its own configured values.

**Format**

Octet string

**Length**

2 bytes

---

## Charging Characteristics Selection Mode

This field specifies how the Charging Characteristics was selected.

Supported values:

servingNodeSupplied	(0),
homeDefault	(3),
roamingDefault	(4),
visitingDefault	(5)

**Format**

Enumerated

## ■ CDR Fields

**Length**

1 byte

---

## Charging ID

This field is a charging identifier, which can be used together with the P-GW address to identify all records involved in a single bearer context. The Charging ID is generated by the P-GW during bearer context activation and is transferred to the context requesting SGW.

**Format**

Integer

**Length**

1-5 bytes

---

## Diagnostics

This field is included in the CDR when the bearer context is released and when the option “gtpp attribute diagnostics” is configured. Only the choice of “gsm0408Value” is used (see below).

**Format**

Choice (gsm0408 only).

**Length**

3 bytes

---

### gsm0408Cause

Refer to TS 24.008 for more information.

**Format**

Integer

**Length**

Always included when the optional Diagnostics field is included.

---

## Duration

This field contains the duration in seconds for the record. For partial records, only the interval described by the recordOpeningTime and the last ChangeTime in the ListOfTrafficVolumes is counted. The value is reset for each new partial CDR. This value is converted from the internal representation in milliseconds to an integer value representing only seconds. The mechanism for this conversion (ceiling, floor, round-off) can be configured.

**Format**

Integer

**Length**

1-5 bytes

## Dynamic Address Flag

This field indicates that PDN address has been dynamically allocated for that particular IP CAN bearer (PDN connection). This field is missing if address is static. Dynamic address allocation might be relevant for charging e.g. as one resource offered and possibly owned by network operator. The presence of this field indicates that the **Served PDP Address** was dynamically assigned during context activation.

**Format**

Boolean

**Length**

1 byte

## List of Traffic Data Volumes

This list includes one or more Traffic Volume containers related to a “Change of Charging Condition”. The maximum number of containers is configurable.

**Format**

Sequence

**Length**

Variable

### GPRS Uplink data volume

The Data Volume GPRS Uplink field is a part of the ChangeOfCharCondition element in the List of Traffic Volumes. It includes the number of octets received in the uplink direction during the timeframe specified by the container. For each new container, the counter is reset and does not accumulate.

The data counted already includes the IP PDP bearer protocols i.e. IP or PPP.

**Format**

Integer

**Length**

1-5 bytes

### GPRS Downlink data volume

The Data Volume GPRS Downlink field is a part of the ChangeOfCharCondition element in the List of Traffic Volumes. It includes the number of octets transmitted in the downlink direction during the timeframe specified by the container. For each new container, the counter is reset and does not accumulate.

The data counted already includes the IP PDP bearer protocols i.e. IP or PPP.

**Format**

Integer

**Length**

1-5 bytes

## Change Condition

The Change Condition field is part of the ChangeOfCharCondition element in the List of Traffic Volumes. It defines the reason for closing the container:

Supported values:

```
ChangeCondition  ::=  ENUMERATED
{
    qosChange      (0),
    tariffTime     (1),
    recordClosure  (2),
    cGI-SAICChange (6),      -- bearer modification. "CHI
    SAI Change"
    rAICChange     (7),      -- bearer modification. "RAI
    Change"
    eCGIChange     (10),     -- bearer modification. "ECGI
    Change"
    tAICChange     (11),     -- bearer modification. "TAI
    Change"
}
```

1. The change condition is based on the current ULI type and not on new ULI. i.e if the ULI type is ECGI during CSRequest and while changing the ULI, whatever be the ULI type in MBRequest, the “changeCondition” should be ECGI change.
2. If the initial ULI has one or more ULI Types(i.e ECGI, TAI, RAI, CGI), then the change condition the priority will be as follows:
  - CGI-SAI Change
  - RAI Change
  - TAI Change
  - ECGI Change
3. If the current ULI type is not present (optional) the change condition is based on the new ULI contents. i.e if new ULI has ECGI, then we will consider it as ECGI change.
4. The ULI in main CDR part indicates the ULI at the time of record opening time. i.e If CSReq comes with ULI U1 and then the ULI is changed to U2, U3 and if we generate a CDR the main ULI in CDR contains ULI as U1, but the next CDR generated contains the ULI as U3 and so on.
5. In container the ULI is present in next container if the previous change condition is either RAI Change, CGI-SAI Change, TAI Change, ECGI Change.

### Format

Enumerated

### Length

1 byte

---

## Change time

The Change Time field is part of the ChangeOfCharCondition element in the List of Traffic Volumes. It provides the local time when a change condition (e.g. record closure) occurred and the container was closed.

The format is shown below.

TimeStamp ::= OCTET STRING (SIZE(6))

-- The contents of this field are a compact form of the UTCTime format containing local time plus an offset to universal time. Binary coded decimal encoding is employed for the digits to reduce the storage and transmission overhead

-- e.g. YYMMDDhhmmssShhmm

-- where

-- YY = Year 00 to 99 BCD encoded

-- MM = Month 01 to 12 BCD encoded

-- DD = Day 01 to 31 BCD encoded

-- hh = hour 00 to 23 BCD encoded

-- mm = minute 00 to 59 BCD encoded

-- ss = second 00 to 59 BCD encoded

-- S = Sign 0 = "+", "-" ASCII encoded

-- hh = hour 00 to 23 BCD encoded

-- mm = minute 00 to 59 BCD encoded

**Format**

BCD encoded octet string

**Length**

9 bytes

---

## User Location Information

This field contains the User Location Information as described in TS 29.274 for eGTP cases (e.g. CGI, SAI, RAI TAI and ECGI).

The field is provided by the SGSN/MME and transferred to the S-GW/P-GW during the IP-CAN bearer activation/modification.

User Location Information contains the location (e.g. CGI/SAI, ECGI/TAI or RAI) where the UE is located and used during the transfer of the data volume captured by the container (applicable only to the SGW-CDR). This is included in the Traffic data container only if previous container's change condition is "user location change". Note the user location information in SGW-CDR main level contains the location where the UE was when CDR was opened.

**Format**

Octet string

**Length**

Based on the type of identity it may vary.

---

## EPC QoS Requested

EPC QoS Information In case of IP-CAN bearer specific container this contains authorized QoS for the IP-CAN bearer. First container for each QCI/ARP pair includes this field. In following containers this field is present if previous change condition is “QoS change”. This field is applicable only in SGW-CDR.

### Format

```
EPCQoSInformation ::= SEQUENCE
{
  --
  -- See TS 29.212 for more information
  --
  qCI                  [1] INTEGER,
  maxRequestedBandwidthUL [2] INTEGER OPTIONAL,
  maxRequestedBandwidthDL [3] INTEGER OPTIONAL,
  guaranteedBitrateUL   [4] INTEGER OPTIONAL,
  guaranteedBitrateDL   [5] INTEGER OPTIONAL,
  aRP                  [6] INTEGER OPTIONAL
}
```

### Length

Variable length format (Will vary based on the values).

---

## iMSsignalingContext

Indicates if the IP-CAN bearer is used for IMS signalling. It is only present if the IP-CAN bearer is an IMS signalling bearer. A IP-CAN bearer for IMS signalling is determined via the “IM CN Subsystem Signalling Flag” conveyed via the “Activate PDP context request” message from the MS to the network (refer to TS 24.008).

### Format

Null

### Length

Zero

---

## List of Served Node Addresses

This field contains 1-16 Serving Node control plane IP used during this record (max of 15 Serving Node Changes). This is a list of IP addresses. If the PLMN-ID of the MME is same after Handover to new MME, one more IP address is added to the list. If the list is overflowed, with configured number of IP addresses, a CDR with “serving node Change” as cause for record

closure will be generated. The serving node addresses, listed here map to the serving node types listed in the field “Serving node Types” in sequence.

**Format**

Octet String containing list of IPV4 or IPV6 IP addresses.

**Length**

The length can vary based on whether the encoded IP address is IPV4 or IPV6.

---

### Served Node IPv4 Binary Address

The octet string included in the field described above includes the IPV4 address of the MME.

**Format**

Octet String

**Length**

4 bytes

---

### Served Node IPv6 Binary Address

The octet string included in the field described above includes the IPV6 address of the MME.

**Format**

Octet String

**Length**

16 bytes

---

## Serving Node Type

These fields contain one or several serving node types in control plane of S-GW or P-GW, which have been connected during the record. The serving node types listed here map to the serving node addresses listed in the field “Serving node Address” in sequence.

The possible values are:

```

ServingNodeType  ::=  ENUMERATED
{
    sGSN      ( 0 ) ,
    pMIPSGW   ( 1 ) ,
    gTPSGW    ( 2 ) ,
    ePDG      ( 3 ) ,
    hSGW      ( 4 ) ,
    mME       ( 5 )
}

```

## ■ CDR Fields

Note: In the SGW-CDR, the possible values are SGSN(0) and MME(5).

**Format**

Sequence of serving Node Type.

**Length**

Variable length format (Based on number of nodes connected during this period).

## Local Record Sequence Number

This field contains a unique sequence number associated with the NodeID field and independent of the bearer context. For each Node ID, this number with range 1..4294967295 is allocated sequentially for each CDR. This along with a Node ID uniquely identifies a CDR. For SGW-CDRs, this field is only included when the option “gtpp attribute local-record-sequence” number is configured.

**Format**

Octet String

**Length**

1-5 bytes

## MS Time Zone

The “Time Zone” IE that the MME may provide to the SGW during the PDN context activation/modification procedure.

**Format**

Octet String

**Length**

2 bytes

## Node ID

This field contains an identifier string for the node that had generated the CDR.

The NodeID field is a printable string of the ndddSTRING format:

n: The first digit is the Sessmgr restart counter having a value between 0 and 7.

ddd: The number of the sessmgr instance generating the CDR.

STRING: This is a configured Node-ID-Suffix having any string between 1 to16 characters, defined using the gtpp attribute node-id command.

If this node-id-suffix is not configured, the S-GW uses the GTPP context name as the Node-id-suffix (truncated to 16 characters).

This field is only included when the option “gtpp attribute local-record-sequence-number” is configured.

**Format**

IA5string

**Length**

5-20 bytes

## PDN Connection Id

This field defines the PDN connection (IP-CAN session) identifier to identify different records belonging to same PDN connection. This field includes Charging Id of first IP-CAN bearer activated within the PDN connection. Together with P-GW address this uniquely identifies the PDN connection.

**Format**

Integer.

**Length**

1-5 bytes

## PDP PDN Type

-- OCTET 1: PDP Type Organization

Spare '1111'      PDP Type Organization Value

PDP Type Organization	Value
ETSI	0
IETF	1

Note: In LTE, only IETF is supported.

-- OCTET 2: PDP/PDN Type Number

Bits

3    2    1

0    0    1      IPv4

0    1    0      IPv6

0    1    1      IPv4/IPv6

Bits 8-4 of octet are spare and are coded as zero.

**Format**

Octet string

**Length**

2 bytes

## PGW Address used

These field is the serving P-GW IP address for the Control Plane. If both an IPv4 and an Ipv6 address of the P-GW is available, the P-GW shall include the Ipv4 address in the CDR. This is a choice attribute and the CDR can contain the Binary format or the ASCII format in the CDR.

**Format**

## ■ CDR Fields

Octet string

**Length**

The length can vary based on whether the encoded IP address is IPv4 or IPv6.

---

### PGW IPv4 Binary Address

The octet string included in the field described above includes the IPv4 address assigned to the subscriber by of the P-GW in binary coding.

**Format**

Octet string

**Length**

4 bytes

---

### PGW IPv6 Binary Address

The octet string included in the field described above includes the IPv6 address assigned to the subscriber by of the P-GW in binary coding.

**Format**

Octet string

**Length**

16 bytes

---

## RAT Type

Holds the value of RAT Type, as provided to S-GW and P-GW, described in TS 29.274 for eGTP case.

The field is provided by the SGSN/MME and transferred to the S-GW/P-GW during the IP-CAN bearer activation/modification.

**Format**

Integer

**Length**

1 byte

---

## Record Extensions

A set of network operator/manufacturer specific extensions to the record.



**Important:** This field is operator-defined and is not encoded in any S-GW CDR dictionary in this release

**Format**

Sequence

**Length**

Variable Length Format

## Record Opening Time

This field contains the time stamp when a PDP context is activated in SGSN or when a subsequent record is opened after a partial record.

The timestamp is determined based on the internal timer which has an accuracy of 10ms. Depending on the configured mechanism this is translated into the timestamp which only shows the full seconds.

The format is shown below.

TimeStamp ::= OCTET STRING (SIZE(6))

The contents of this field are a compact form of the UTCTime format containing local time plus an offset to universal time. Binary coded decimal encoding is employed for the digits to reduce the storage and transmission overhead

-- e.g. YYMMDDhhmmssShhmm  
 -- where  
 -- YY = Year 00 to 99 BCD encoded  
 -- MM = Month 01 to 12 BCD encoded  
 -- DD = Day 01 to 31 BCD encoded  
 -- hh = hour 00 to 23 BCD encoded  
 -- mm = minute 00 to 59 BCD encoded  
 -- ss = second 00 to 59 BCD encoded  
 -- S = Sign 0 = "+", "-" ASCII encoded  
 -- hh = hour 00 to 23 BCD encoded  
 -- mm = minute 00 to 59 BCD encoded

**Format**

BCD encoded octet string

**Length**

9 bytes

## Record Sequence Number

A running sequence number with range 1.. 4294967296 used to link partial records generated by the SGW for a specific IP-CAN bearer context (characterized with the same Charging ID and P-GW address). This field is not present if the first record is also the final record.

**Format**

Integer

**Length**

1-5 bytes

## Record Type

The field identifies the type of the record:

SGW-CDR(sgwPDPRecord) 84 (0x54)

## ■ CDR Fields

**Format**

Integer

**Length**

1 byte

## Served IMEISV

This field contains the international mobile equipment identity (IMEISV) of the equipment served, if available.

The structure of the IMEI is defined in TS 23.003.

The IMEI is composed of the following elements:

- Type Allocation Code (TAC). Its length is 8 digits;
- Serial Number (SNR) is an individual serial number uniquely identifying each equipment within each TAC. Its length is 6 digits;
- Software Version Number (SVN) identifies the software version number of the mobile equipment. Its length is 2 digits.

If SV is not available, a filler digit “f” is added after the spare digit to fill up the last byte. Spare digit: this digit shall be zero, when transmitted by the MS.

**Format**

BCD encoded octet string

**Length**

8 bytes

## Served IMSI

This field contains the International Mobile Subscriber Identity (IMSI) of the served party. The IMSI is formatted in accordance with 3GPP TS 23.003.

**Format**

BCD encoded octet string

**Length**

3-8 bytes

## Served MSISDN

The field tracks the Mobile Station (MS) ISDN number (MSISDN) of the subscriber which is transparently copied from the Create Session Request message.

**Format**

BCD encoded octet string

**Length**

1-9 bytes

## Serving Node PLMN Identifier

PLMN identifier (MCC and MNC) of the P-GW used. This field is present in CDRs if the P-GW PLMN-ID is available in the CSR message from Serving Node (e,g MME).

MCC and MNC are coded as described for “User Location Info” in TS 29.274.

**Format**

Octet string

## Serving PDP IP Address

This field contains the IP address for the PDN connection (PDP context, IP-CAN bearer) if available. This is a network layer address of type IP version 4 or IP version 6. The address for each Bearer type is allocated either temporarily or permanently (see “Dynamic Address Flag”).

**Format**

Octet string

**Length**

The length can vary based on whether the encoded IP address is IPv4 or IPv6.

### PDP IPv4 Binary Address

The octet string included in the field described above includes the IPv4 address assigned to the subscriber by of the P-GW in binary coding.

**Format**

Octet string

**Length**

4 bytes

### PDP Ipv6 Binary Address

The octet string included in the field described above includes the IPv6 address assigned to the subscriber by of the P-GW in binary coding.

**Format**

Octet string

**Length**

16 bytes

## SGW Address

These field is the serving S-GW IP address for the Control Plane. If both an IPv4 and an IPv6 address of the S-GW is available, the S-GW shall include the IPv4 address in the CDR. This is a choice attribute and the CDR can contain the Binary format or the ASCII format in the CDR.

**Format**

Octet string

**Length**

The length can vary based on whether the encoded IP address is IPv4 or IPv6.

---

### SGW IPv4 Binary Address

This field is the serving control plane S-GW IPv4 address on the S5 interface.

**Format**

Octet string

**Length**

4 bytes

---

### SGW IPv6 Binary Address

This field is the serving control plane S-GW IPv6 address on the S5 interface.

**Format**

Octet string

**Length**

16 bytes

---

## SGW Change

This field is present only in the SGW-CDR to indicate that this is the first record after an S-GW change. In this case, it is set to TRUE (“FF”)

**Format**

Boolean

**Length**

1 byte

---

## Start Time

This field contains the time when the IP-CAN session starts at the S-GW/P-GW, available in the CDR for the first bearer in an IP-CAN session.

The timestamp is determined based on the internal timer which has an accuracy of 10ms. Depending on the configured mechanism this is translated into the timestamp which only shows the full seconds.

The format is shown below.

TimeStamp ::= OCTET STRING (SIZE(6))

The contents of this field are a compact form of the UTCTime format containing local time plus an offset to universal time. Binary coded decimal encoding is employed for the digits to reduce the storage and transmission overhead

-- e.g. YYMMDDhhmmssShhmm

-- where

-- YY = Year 00 to 99 BCD encoded

-- MM = Month 01 to 12 BCD encoded

```

-- DD  =  Day 01 to 31    BCD encoded
-- hh  =  hour 00 to 23   BCD encoded
-- mm  =  minute 00 to 59  BCD encoded
-- ss  =  second 00 to 59  BCD encoded
-- S   =  Sign 0 = "+", "-" ASCII encoded
-- hh  =  hour 00 to 23   BCD encoded
-- mm  =  minute 00 to 59  BCD encoded

```

**Format**

BCD encoded octet string

**Length**

9 bytes

## Stop Time

This field contains the time when the IP-CAN session is terminated at the S-GW/P-GW, available in the CDR for the last bearer in an IP-CAN session.

The timestamp is determined based on the internal timer which has an accuracy of 10ms. Depending on the configured mechanism (ceiling, floor, round-off) this is translated into the timestamp which only shows the full seconds.

The format is shown below.

TimeStamp ::= OCTET STRING (SIZE(6))

The contents of this field are a compact form of the UTCTime format containing local time plus an offset to universal time. Binary coded decimal encoding is employed for the digits to reduce the storage and transmission overhead

```

-- e.g. YYMMDDhhmmssShhmm
-- where
-- YY  =  Year 00 to 99    BCD encoded
-- MM  =  Month 01 to 12   BCD encoded
-- DD  =  Day 01 to 31     BCD encoded
-- hh  =  hour 00 to 23    BCD encoded
-- mm  =  minute 00 to 59  BCD encoded
-- ss  =  second 00 to 59  BCD encoded
-- S   =  Sign 0 = "+", "-" ASCII encoded
-- hh  =  hour 00 to 23    BCD encoded
-- mm  =  minute 00 to 59  BCD encoded

```

**Format**

BCD encoded octet string

**Length**

9 bytes

## User Location Information

This field contains the User Location Information as described in TS 29.274 for eGTP case (e.g. CGI, SAI, RAI TAI and ECGI).

The field is provided by the SGSN/MME and transferred to the S-GW/P-GW during the IP-CAN bearer activation/modification.

User Location Information contains the location (e.g. CGI/SAI, ECGI/TAI or RAI) where the UE is located and used during the transfer of the data volume captured by the container (applicable only to the SGW-CDR). This is included in the Traffic data container only if previous container's change condition is “user location change”. Note the user location information in SGW-CDR main level contains the location where the UE was when PGW-CDR was opened.

The flags ECGI, TAI, RAI, SAI and CGI in octet 5 indicate if the corresponding fields are present in the IE or not. If one of these flags is set to “0”, the corresponding field is not present at all. The respective identities are defined in 3GPP TS 23.003.

The following subclauses specify the coding of the different identities. For each identity, if an Administration decides to include only two digits in the MNC, then bits 5 to 8 of octet 7 are coded as “1111”.

### **CGI field:**

The Location Area Code (LAC) consists of 2 octets. Bit 8 of Octet 9 is the most significant bit and bit 1 of Octet 10 the least significant bit. The coding of the location area code is the responsibility of each administration. Coding using full hexadecimal representation shall be used.

The Cell Identity (CI) consists of 2 octets. Bit 8 of Octet 11 is the most significant bit and bit 1 of Octet 12 the least significant bit. The coding of the cell identity is the responsibility of each administration. Coding using full hexadecimal representation shall be used.

### **SAI field:**

The Location Area Code (LAC) consists of 2 octets. Bit 8 of Octet 9 is the most significant bit and bit 1 of Octet 10 the least significant bit. The coding of the location area code is the responsibility of each administration. Coding using full hexadecimal representation shall be used.

The Service Area Code (SAC) consists of 2 octets. Bit 8 of Octet 11 is the most significant bit and bit 1 of Octet 12 the least significant bit. The SAC is defined by the operator.

### **RAI field:**

The Location Area Code (LAC) consists of 2 octets. Bit 8 of Octet 9 is the most significant bit and bit 1 of Octet 10 the least significant bit. The coding of the location area code is the responsibility of each administration. Coding using full hexadecimal representation shall be used.

The Routing Area Code (RAC) consists of 2 octets. Only Octet 11 contains the RAC. Octet 12 is coded as all 1's (11111111). The RAC is defined by the operator.

### **TAI field:**

The Tracking Area Code (TAC) consists of 2 octets. Bit 8 of Octet 9 is the most significant bit and bit 1 of Octet 10 the least significant bit. The coding of the tracking area code is the responsibility of each administration. Coding using full hexadecimal representation shall be used.

### **ECGI field:**

The E-UTRAN Cell Identifier (ECI) consists of 28 bits. Bit 4 of octet 10 is the most significant bit and bit 1 of Octet 11 the least significant bit. The coding of the E-UTRAN cell identifier is the responsibility of each administration. Coding using full hexadecimal representation shall be used.

### **Format**

Octet string

**Length**

Varies based on the type of identity.



# Chapter 16

## WLAN CDR Field Reference Tables

---

The PDG/TTG provides CDRs that are compliant with the definitions in 3GPP TS32.298. When modifications are required, changes to the standard behavior can be implemented in different dictionaries which can be selected in the configuration file. This provides the flexibility to adapt to a customer's needs, and therefore, to a legacy post-processing billing interface, while retaining the standard behavior.

Configure GTPP dictionaries with the `gtpp dictionary` command in the Context Configuration Mode of the system's command line interface (CLI).

The Category column in all tables use key described in the following table.

**Table 13. Dictionary Table Key**

Abbreviation	Meaning	Description
M	Mandatory	A field that must be present in the CDR.
C	Conditional	A field that must be in a CDR if certain conditions are met.
OM	Operator Provisionable: Mandatory	A field that an operator has provisioned and must be included in the CDR for all conditions.
Oc	Operator Provisionable: Conditional	A field that an operator has provisioned that must be included in the CDR if certain conditions are met.

# CDR Fields Supported in WLAN CDRs

The table in this section lists the WLAN fields present in GTPP dictionaries.

## standard, and custom1 - custom6 Dictionaries

WLAN CDR fields for TS 32.252

Field	Category	Description
Record Type	M	This field identifies the type of record. The 3GPP 32298 does not define any values for record type. This value is selected as this is not yet reserved by any CDRs.
Network Initiated PDP Context	O	This field indicates that the PDP context was network-initiated. The field is missing in case of UE-activated PDP context.
Served IMSI	M	This field contains the International Mobile Subscriber Identity (IMSI) of the served party. The IMSI is formatted in accordance with 3GPP TS 23.003.
PDG Address	M	This field provides the current service PDG IP address for the control plane.
PDG IPv4 Binary Address	M	The octet string included in the field described above includes the address of the PDG service in binary coding.
Charging ID	M	This field is a charging identifier, which can be used with the PDG address to identify all records produced in the PDG involved in a single PDP context. The charging ID is generated by the PDG at PDP context activation.
Serving WAG Address	M	This field provides the current serving WAG IP address for the control plane.
Serving WAG IPv4 Binary Address	M	The octet string included in the field described above includes the address of the PDG service in binary coding.
Access Point Name Network Identifier	M	This field contains the Network Identifier part of the Access Point Name (APN). It is provided by WMN during the IPSec or SSL establishment procedure.
PDP Type	O	This field defines the PDG type: IP or PPP.
Served WLAN PDP Address	M	This field contains the PDP address of the served IMSI. The standard 3GPP TS 32.298 allows a choice of either IPAddress or ETSIAddress.
WLAN UE Remote Address	M	Only the choice of IPAddress is supported by the PDG for the field described above.
WLAN UE Remote IPv4 Binary Address	M	The octet string included in the field WLAN UE Remote Address includes the IPv4 address assigned to the subscriber by the PDG in binary coding.
Dynamic Address Flag	O	This field indicates that the PDP address has been dynamically allocated for that particular PDP context. This field is missing if the address is static, that is, part of the PDP context subscription.
List of Traffic Data Volumes	M	This list includes one or more Traffic Data Volume containers. The number of containers is configurable with a maximum of 4 for WLAN CDRs.

Field	Category	Description
Change of Charging Condition	M	One traffic data volume container contains a list of change of charging conditions: Data Volume Uplink, Data Volume Downlink, Change Condition, Change Time, Failurehandling Continue. The QoS values may only be included in the first container. In later containers, the presence depends on what was changed.
QoS Negotiated	O	QoS Negotiated indicates that the applied QoS was accepted by the network. Field is compliant with 3GPP standards.
GPRS Uplink Data Volume	M	Data Volume Uplink includes the number of octets transmitted during the use of the packet data services in the uplink direction. Note that a maximum of $2^{32}$ bytes can be counted in this field. A volume trigger should be defined for this value to avoid an overflow, if not already done for a smaller amount of traffic.
GPRS Downlink Data Volume	M	Data Volume Downlink includes the number of octets transmitted during the use of the packet data services in the downlink direction. Note that a maximum of $2^{32}$ bytes can be counted in this field. A volume trigger should be defined for this value to avoid an overflow, if not already done for a smaller amount of traffic.
Change Condition	M	Change Condition defines the reason for closing the container, such as tariff time change, QoS change, or closing of the CDR. Values according to TS 32.998 are: qoSChange = 0, tariffTime = 1, recordClosure = 2.
Change Time	M	A time stand that defines the moment when the volume container or the CDR is closed.
Record Opening Time	M	This field contains the time stamp of when the PDP context was activated in the PDG or when a subsequent record was opened after a partial record. The timestamp is based on the internal timer which has an accuracy of 10ms. Depending on the configured mechanism, this is translated into a timestamp that shows only the full seconds.
Duration	M	This field contains the duration in seconds of the PDP contexts with the range of 0 to 4294967295. It is the duration from Record Opening Time to record closure. For partial records, this is the duration of the individual partial record and not the cumulative duration.
Cause for Record Closing	M	This field shows the reason for the release of the CDR. The values are: <ul style="list-style-type: none"> <li>normalRelease = 0</li> <li>abnormalRelease = 4</li> <li>volumeLimit = 16</li> <li>timeLimit = 17</li> <li>maxChangeCond = 19</li> <li>managmenetIntervention = 20</li> </ul>
Diagnostics	O	This field is included in the CDR when the PDP context is released and when the option <b>gtpp-attribute diagnostics</b> is configured.
gsm0408Cause	M	The cause is used in the Diagnostics field and contains one of the following values: The PDP context is terminated gracefully = 36 AAA server disconnect = 40 The PDG sends delete PDP context request for any other reason = 26
Record Sequence Number	O	A running sequence number with range 1 to 4294967295 that links partial records generated by the PDG for a specific PDP context (characterized with the same Charging ID and PDG address pair). This field is not present if the first record is also the final record.

Field	Category	Description
Node ID	O	<p>This field contains an identifier string for the node that generated the CDR. The NodeID field is a printable string of the ndddSTRING format:</p> <ul style="list-style-type: none"> <li>• n: the first digit is the sessmgr restart counter having a value between 0 and 7.</li> <li>• ddd: The number of the sessmgr instance generating the CDR.</li> <li>• STRING: A configured Node-ID-Suffix string of 1 to 16 characters. Defined with the <b>gtpp attribute node-id</b> command.</li> </ul>
recordExtensions	O	
Local Record Sequence Number	O	<p>For each Node ID, this number, with range 1 to 4294967295, is allocated sequentially for each CDR. With the Mode ID, it uniquely identifies a CDR.</p> <p>For WLAN-CDRs, this field is only included when the option <b>gtpp attribute local-record-sequence</b> number is configured.</p>
APN Selection Mode	O	<p>An index that shows how the APN was selected:</p> <ul style="list-style-type: none"> <li>• 0 = MS or network provided APN, subscribed verified.</li> <li>• 1 = MS provided APN, subscription not verified.</li> <li>• 2 = Network provided APN, subscription not verified.</li> </ul>
Served MSISDN	O	<p>This field tracks the Mobile Station (MS) ISDN number (MSISDN) of the subscriber. Sent by the AAA server.</p>
Charging Characteristics	M	<p>Lists the charging characteristics applied to the PDP context. The PDG can accept charging characteristics from the AAA server or use its own configured value. PDG-configured charging characteristics are specified as part of the PDG Service and are applied for WLAN CDRs to subscriber PDP contexts through APN templates.</p>
Charging Characteristics Selection Mode	O	<p>Lists the charging characteristic type that the PDP applied to the CDR. The values for this field are defined in 3GPP TS 32.298:</p> <ul style="list-style-type: none"> <li>• AAA supplied: The PDG is using the charging characteristics supplied by the AAA server. AAASupplied = 0</li> <li>• Home default: Home subscriber PDG-configured charging characteristics. homeDefault = 3</li> <li>• Roaming default: Roaming subscriber PDG-configured charging characteristics. roamingDefault = 4</li> <li>• Visiting default: Visiting subscriber PDG-configured charging characteristics. visitingDefault = 5</li> </ul>
WAG PLMN Identifier	O	<p>The WAG PLMN identifier (MSS and MNC) used during this record.</p>

Field	Category	Description
Rat Type	O	<p>This field shows the Radio Access Technology (RAT) type currently used by the Mobile Station. The field is present in the CDR if provided by WLAN:</p> <ul style="list-style-type: none"><li>• 0 = Reserved</li><li>• 1 = UTRAN</li><li>• 2 = GERAN</li><li>• 3 = <b>WLAN</b></li></ul>



# Chapter 17

## HDD Storage

---

This chapter describes the mechanism implemented in the ASR 5000 platform for short term storage of charging records (CDRs) in the event of loss of communication with an external Charging Gateway Function (CGF).

# Overview

The hard disk was introduced in the ASR 5000 platform to add storage capability. The first application is used in CDMA environments to increase buffering for I/O between the gateway and L-ESS to alleviate tight linkage required to avoid record loss due to overrun on the ASR 5000 PSC buffers.

The External Storage System (ESS) is a high availability, fault tolerant, redundant solution for short-term storage of files containing detail records (UDRs/EDRs/FDRs (xDRs)). To avoid loss of xDRs on the chassis due to overwriting, deletion, or unforeseen events such as power or network failure or unplanned chassis switchover, xDRs are off-loaded to ESS for storage and analysis to avoid loss of charging and network analysis information contained in the xDRs. The xDR files can be pulled by the L-ESS from the chassis, or the chassis can push the xDR files to the L-ESS using SFTP protocol. In the Push mode, the L-ESS URL to which the CDR files need to be transferred to is specified. The configuration allows a primary and a secondary server to be configured. Configuring the secondary server is optional. Whenever a file transfer to the primary server fails for four consecutive times, the files will be transferred to the secondary server. The system running with ECS stores xDRs on an L-ESS, and the billing system collects the xDRs from the L-ESS and correlates them with the AAA accounting messages using 3GPP2-Correlation-IDs (for PDSN) or Charging IDs (for GGSN).

The second application is intended for UMTS environment. Records generated on ASR 5000 are sent through UDP to an external storage application running on possibly clustered SUN servers utilizing shared storage. In parallel, records are sent over GTPP to a CGF. In addition to (e)GCDRs, the hard disk supports SCDRs and MCDRs generated by SGSN.



**Important:** The hard disk is not designed to support all features supported by the external storage application and not intended to replace this application in all situations.

The hard disk is useful for other applications:

- Store the Content Filtering static ratings database instead of using FLASH; valuable for other users including recovery scenarios.
- IPMS
- Large volume firewall and other DPI information such as applications/particular user, and users/bay station heretofore not store-able embedded.

The hard drive serves a number of uses in providing storage for various records generated by the mobile gateway that formerly require buffering or treatment outside of the gateway, necessitating purchase and operation of auxiliary servers. For 3GPP2 accounts the hard disk is an enhancement to service, and not a replacement. The hard drive is required to provide non-volatile storage in the ASR 5000. For 3GPP accounts the hard disk can be used instead of external storage in networks where storage and record formatting needs can be met by the hard disk. The communication link between the ASR 5000 and external storage is removed. GTPP continues to be supported. Files can be accessed by either GTPP (streaming) or sFTP (file I/O), but not both. At the same time, different files can be accessed by GTPP or sFTP.

## Benefits

The HDD functionality provides an additional level of protection to the wireless operator by ensuring the CDRs are preserved in case the Charging Gateway (CGF) goes down or loses connectivity with the ASR 5000 gateway. At the same time, this was implemented in a way that does not require any addition or modification to the existing mediation/billing systems.

# Hardware Overview

This section provides information on the hardware components that comprise the HDD feature in the ASR 5000.

The HDD functionality takes advantage of the Hard Disk available in the System Management Card (SMC) of the ASR 5000. The System Management Card (SMC) serves as the primary controller and is responsible for initializing the entire system, and loading the software's configuration image into other cards in the chassis as applicable. SMCs are installed in the chassis slots 8 and 9. During normal operation, the SMC in slot 8 serves as the primary (Active), while the SMC in slot 9 serves as the secondary (Standby).

Each SMC contains an enterprise-class Serial Attached SCSI (SAS) hard disk to load and store configuration data, software updates, buffer accounting information, and store diagnostic or troubleshooting information. Space for CDR storage in the internal Hard Disk is 100 Gigabytes (GB). Redundant control mechanisms allow for data to be written to the hard disks on both the active and standby SMCs.



**Important:** No hardware changes (PSC, SMC, chassis, etc.) are required to enable the CDR Storage and Retransmission. However, an appropriate software version has to be loaded in the ASR 5000.

# How HDD Works

This section describes the working of the HDD functionality.

The functionality for CDR Storage and Retransmission works without requiring an external storage. In normal operating mode, when CGF is up and reachable, the ASR 5000 streams CDRs to the CGF. If the CGF becomes unreachable, the ASR 5000 starts temporarily storing CDRs into the internal hard disk. Once the CGF is up again, the ASR 5000 will stream those records stored in its hard disk to the external CGF via GTP protocol. This is called the **streaming** mode of operation.

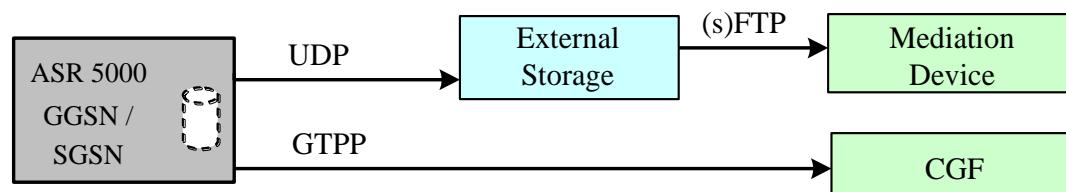
When CDR Internal Storage and Retransmission is configured, the ASR 5000 continuously checks for reachability of configured CGFs. When there is no reply to Echo Requests or responses to signaling messages from the CGF, the ASR 5000 assumes that the CGF is down and starts storing the CDRs into its internal hard disk.



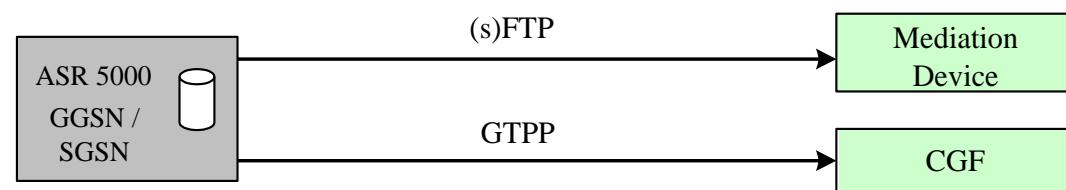
**Important:** Only one CGF server per GTPP group is supported.

This function in the ASR 5000 incorporates partial external storage functionality inside the ASR 5000 gateway. The following diagram depicts the mechanism using external storage (no hard disk configured in the ASR 5000) and using the hard disk.

Figure 8. **HDD Mechanism**



Before hard disk support or with hard disk disabled



With hard disk support enabled

The following example shows the amount of time that CDRs can be stored in the internal hard disk and the coverage in case CGF is down. Assuming a CDR size of 350 bytes, approximately 285 million CDRs can be stored in 100 GB of hard disk. Based on information from deployed systems, a peak rate of 4M (million) records/hour provides 2.9 days of storage. This means that assuming 2M sessions per gateway (say GGSN) at peak busy hour, and each session generates approximately 2 GCDRs per hour, 4 million CDRs/hour represents the worst case scenario for the Busy Hour.

## ■ How HDD Works

Assuming an average 75% of that busy hour,  $0.75 \times 96\text{M CDR} = 72\text{M CDR per day}$ ; for 350 bytes per CDR, it yields approximately 4 days of storage.

# Deployment Scenarios

The HDD functionality is enabled in the ASR 5000 gateway in the following deployment scenarios:

- **CGF configured but not reachable:** The ASR 5000 attempts to stream the CDRs to the configured CGF. If the CGF does not respond to queries from ASR 5000 or GTP messages, CDRs will be stored in the internal HDD for future retransmission when CGF becomes reachable again
- **CGF configured and active, then goes down:** The ASR 5000 was sending CDRs to CGF (via GTPP) normally. Upon loss of reachability of the CGF, the ASR 5000 determines that CGF is down and starts storing CDRs in its internal HDD.
- **CGF configured, goes down and later becomes available:** CDRs were sent (streamed) to CGF until it becomes unreachable. After ASR 5000 determines CGF is down/unreachable, it starts storing CDRs in internal HDD. When CGF becomes available again, CDRs are streamed to CGF, starting from the older CDR first.

# HDD Configuration

This section describes how to configure the HDD.

This section covers the following topics:

- [Configuring HDD](#)
- [Configuring EDR/UDR Parameters](#)

## Configuring HDD

This section describes how to configure the HDD feature.



**Important:** This feature is disabled by default in the ASR 5000.

In GTPP group mode, an option is added to enable this functionality with local-fallback option to existing **gtpp storage-server mode** in the ASR 5000:

```
default gtpp storage-server mode { local | remote | streaming }
```

Notes:

- **default**: Returns the GTPP group configuration to the default ‘remote’ value (the ASR 5000 streams CDRs to the configured external CGF) for the GTPP.
- If **remote** is configured, the ASR 5000 sends CDRs to the external CGF. In case CGF is down or unreachable, CDRs will be lost.
- If **local** is configured, records are stored in the ASR 5000’s internal hard disk. Mediation / billing system can retrieve the records through Secure FTP (sFTP).
- If **streaming** is configured, then the CDRs are sent to CGF by default. If the CGF is down or unreachable, CDRs are temporarily stored in the internal hard disk and streamed to CGF once it becomes available.

## Configuring EDR/UDR Parameters

This section provides an example configuration to configure EDR/UDR file transfer and file properties parameters, including configuring hard disk support on SMC card on ASR 5000, transfer modes, transfer interval, etc.

To configure EDR/UDR file parameters:

```
configure
```

```
context <context_name>
```

```

edr-module active-charging-service

    cdr [ [ push-interval <interval> ] [ push-trigger space-usage-percent
<trigger_percentage> ] [ remove-file-after-transfer ] [ transfer-mode { pull |
push primary { encrypted-url <encrypted_url> | url <url> } [ secondary {
encrypted-secondary-url <encrypted_secondary_url> | url <secondary_url> } ] } ] ]
[ via local-context ] + | use-harddisk ]

    file [ charging-service-name { include | omit } ] [ compression { gzip
| none } ] [ current-prefix <string> ] [ delete-timeout <seconds> ] [ directory
<directory_name> ] [ edr-format-name ] [ exclude-checksum-record ] [ field-
separator { hyphen | omit | underscore } ] [ file-sequence-number rulebase-seq-
num ] [ headers ] [ name <file_name> ] [ reset-indicator ] [ rotation [ num-
records <number> | time <seconds> | volume <bytes> ] ] [ sequence-number { omit
| padded | padded-six-length | unpadded } ] [ storage-limit <limit> ] [ time-
stamp { expanded-format | rotated-format | unix-format } ] [ trailing-text
<string> ] [ trap-on-file-delete ] [ xor-final-record ] +

    exit

udr-module active-charging-service

    file [ charging-service-name { include | omit } ] [ compression { gzip
| none } ] [ current-prefix <string> ] [ delete-timeout <seconds> ] [ directory
<directory_name> ] [ exclude-checksum-record ] [ field-separator { hyphen | omit
| underscore } ] [ file-sequence-number rulebase-seq-num ] [ headers ] [ name
<file_name> ] [ reset-indicator ] [ rotation [ num-records <number> | time
<seconds> | volume <bytes> ] ] [ sequence-number { omit | padded | padded-six-
length | unpadded } ] [ storage-limit <limit> ] [ time-stamp { expanded-format |
rotated-format | unix-format } ] [ trailing-text <string> ] [ trap-on-file-
delete ] [ udr-seq-num ] [ xor-final-record ] +

    end

```

Notes:

- The **cdr** command keywords can be configured either in the EDR or the UDR Configuration Mode. Configuring in one mode prevents the configurations from being applied in the other mode.
- The **use-harddisk** keyword is only available on the ASR 5000.

## Viewing Statistics

To view EDR-UDR file statistics, in the Exec Mode, enter the following command:

```
show active-charging edr-udr-file statistics
```

## Pushing EDR/UDR Files Manually

To manually push EDR/UDR files to the configured L-ESS, in the Exec mode, use the following command:

```
cdr-push { all | local-filename <file_name> }
```

Notes:

- Before you can use this command, the CDR transfer mode and file locations must be set to push in the EDR/UDR Module Configuration Mode.
- The **cdr-push** command is available in the Exec Mode.
- **<file\_name>** must be absolute path of the local file to push.

## Retrieving EDR and UDR Files

To retrieve UDR or EDR files you must SFTP into the context that was configured for EDR or UDR file generation.

This was done with the FTP-enabled account that you configured in the *Enabling Charging Record Retrieval* section

The following commands use SFTP to log on to a context named **ECP** as a user named **ecpadmin**, through an interface configured in the ECS context that has the IP address **192.168.1.10** and retrieve all EDR or UDR files from the default locations:

```
sftp -oUser=ecpadmin@ECP 192.168.1.10:/records/edr/*  
sftp -oUser=ecpadmin@ECP 192.168.1.10:/records/udr/*
```

# Appendix A

## AAA Engineering Rules

---

This section provides AAA engineering rules and guidelines that must be considered prior to configuring the system for AAA functionality.

# AAA Interface Rules

The following engineering rules apply to the AAA interface including RADIUS and Diameter:

- AAA interfaces are specified by assigning the IP address of a logical interface within a specific context as the RADIUS NAS IP Address (RFC-2865 and RFC-2866) within the same context. This is done using the **radius attribute nas-ip-address** command in the context configuration mode.
- AAA interfaces in support of data services can be configured within any context.
  - Typically it exists in the:
    - Ingress context for PDSN and ASNGW services
    - Egress context for GGSN services
  - A AAA interface is selected in the following order:
    - NAI-based selection
    - Default AAA context
    - Last-resort AAA context
    - If all else fails defaults to the Ingress Context
- AAA servers can be configured with “primary” and “backup” servers for any context.
- Authentication and Accounting servers can be configured individually per context.
- Multiple AAA contexts can be configured to support different accounting and authentication servers based on the domain where that the subscriber belongs.
- AAA server group provides AAA functionality to the each subscriber separately with in the same context.
- AAA server group for AAA functionality can be configured with following limits:
  - A total of 800 AAA server groups (including “default” server group) are available per context or system.
  - A maximum number of authentication/accounting servers per AAA server group is 128.
  - A maximum of 1600 servers can be configured in a context or a system, regardless of the number of server groups, with any combination for authentication and/or accounting.
  - A maximum of 800 NAS-IP addresses/NAS identifier (1 primary and 1 secondary per server group) can be configured per context.

# Appendix B

## RADIUS Server State Behavior

---

This appendix provides an explanation of RADIUS server states and the commands that affect them. It also provides a list of triggers that change servers in a “Down” state to “Active”.

# Understanding RADIUS Server States and Commands

## Server States

The system defines three server states for connected RADIUS servers:

- **Active**: The server is believed to be operational.
- **Not Responding**: The server has failed to respond to a message from the system a configured number of times (retries).
- **Down**: The system is no longer sending requests to the server.

## RADIUS Server Commands

RADIUS server states are controlled by parameters set in the RADIUS Server Group Configuration Mode. The commands are:

- **detect-dead-server**: Configures how the system determines that a RADIUS server is not functioning. One or both of the following parameters should be set:
  - **consecutive-failures**: Configures the consecutive number of times the RADIUS server is unreachable by any single aaamgr on the system based on the **max-retries** command. If this command is enabled, each time the maximum number of retries is exceeded, this counter increments by one for the particular aaamgr and server. When any aaamgr exceeds this counter for a specific RADIUS server, the server's state is changed to "Down" and the deadtime timer is started. The default is enabled and 4.
  - **response-timeout**: Configures a specific delay, in seconds, in receiving a response from the RADIUS server before the server's state is changed to "Down" and the deadtime timer is started. The default is disabled.



**Important:** If **response-timeout** is configured and **consecutive-failures** is not, the system will only wait for the specified period of time before changing the server's state to "Down", ignoring other settings such as **radius timeout**, and **max-retries**.

If **response-timeout** is configured and **consecutive-failures** is not, **consecutive-failures** is removed entirely from the system, including default configuration. If both parameters are configured, then both conditions must be met to change a RADIUS server's state to "Down".

- **deadtime**: Configure the maximum amount of time, in minutes, that must elapse after a context has exceeded one or both of the **detect-dead-server** parameters, depending on which parameter is configured. Once

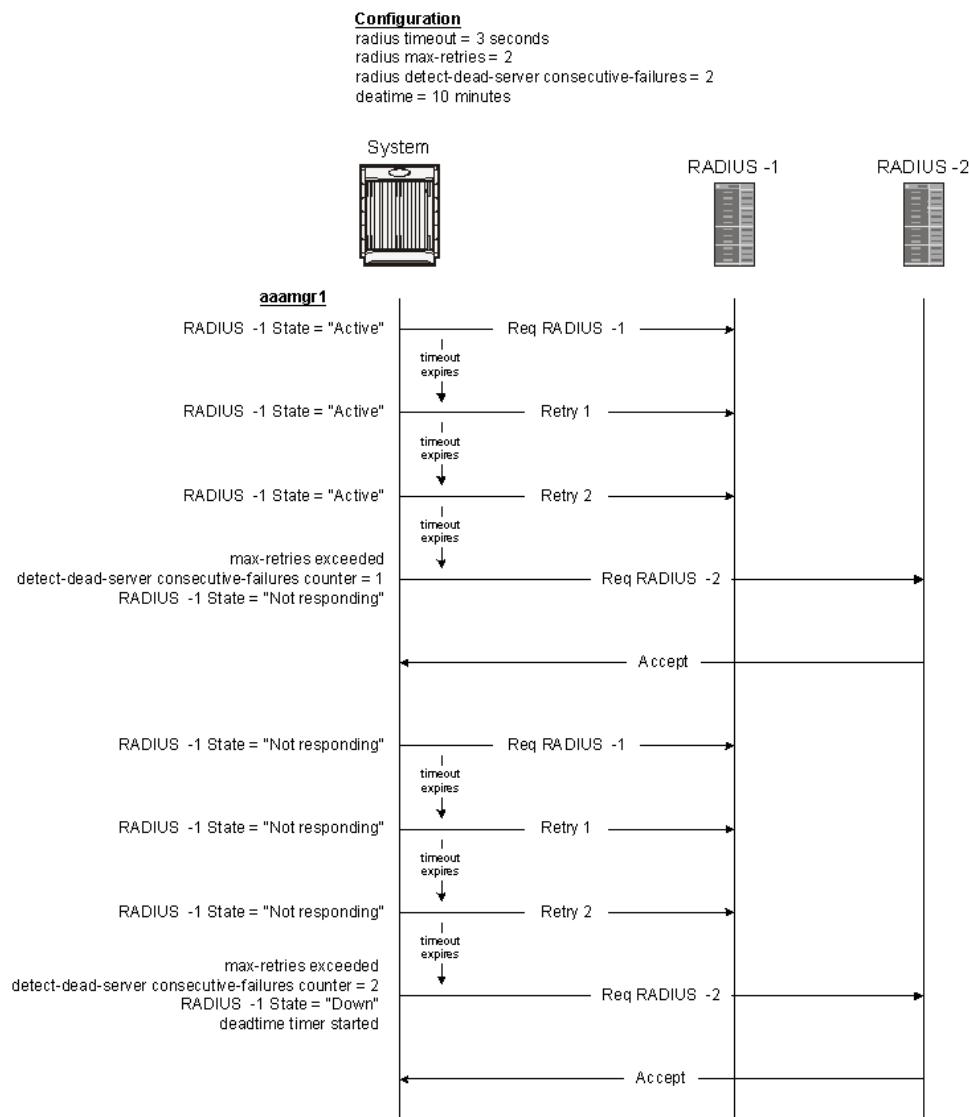
this timer has elapsed, the system reclassifies the RADIUS server as “Active” and subsequent requests to it can be made. If **radius deadtime** is not explicitly configured, the default value of 10 minutes is used.

- **max-retries**: Configures maximum number of times the system attempts to retry communication with a RADIUS server. Once exceeded, the system changes the state of the server to “Not Responding”, increments the **detect-dead-server consecutive-failures** counter (if configured), and attempts to communicate with another RADIUS server. The default value for this parameter is 5.
- **max-transmissions**: Configures the maximum number of times the system transmits authentication requests to a server before it fails the authentication due to lack of response. The absolute maximum number of transmissions is equal to  $NS * (N + 1)$ , where NS is the number of configured authentication servers, and N is the setting for **radius max-retries**. The default for this command is disabled.
- **timeout**: Specifies how many seconds the system waits for a response from a RADIUS server before re-transmitting the request.

More information regarding each command can be found in the *Cisco ASR 5000 Series Command Line Interface Reference*.

The following figure shows a simple flow of events and how the system reacts based on configured parameters.

Figure 9. Sample RADIUS Communication Flow



## Server State Triggers

A number of triggers, events, and conditions can occur that change the state of a RADIUS server from “Down” to “Active” as defined by the system. They are:

- When the timer, based on the RADIUS Server Group Configuration Mode command: **deadtime** has expired, the server’s state on the system is returned to “Active”.



**Important:** This parameter should be set to allow enough time to solve the issue that originally caused the server's state to be changed to "Down". After the deadtime timer expires, the system returns the server's state to "Active" regardless of whether or not the issue has been fixed.

- When a RADIUS authentication server is configured, the server state is initialized as "Active".
- When a RADIUS accounting server is configured and after receiving response for Acct-On message, the server state is made "Active".
- When a RADIUS accounting server is configured and after the Acct-On message exceeds the max retries setting and times-out, the server state is made "Active".
- When a RADIUS accounting server is configured with Acct-On disabled, the server state is made "Active".
- When a response from a RADIUS server is received, the server state is made "Active".
- When a RADIUS server responds to the Exec Mode command **radius test**, the server state is made "Active".
- When a RADIUS probe is enabled and the probe response is received, the server state is made "Active".
- When a RADIUS probe request times-out after max retries, the server state is made "Active".
- If only one RADIUS authentication server is "Active" and goes down, all RADIUS authentication servers are made "Active".
- If only one RADIUS accounting server is "Active" and goes down, all RADIUS accounting servers are made "Active".



**Important:** The system uses the above triggers to mark RADIUS servers as "Active", however, this does not necessarily mean that the actual server is functional. When the system changes a server state, a trap is automatically sent to the management station. Action should be taken to identify the cause of the failure.



# Appendix C

## Switching CDRs

---

This appendix describes the following procedures:

- [Switching CDRs from HDD to GSS](#)
- [Switching CDRs from GSS to HDD](#)

# Switching CDRs from HDD to GSS

This section describes how to switch CDRs from HDD to GSS with:

- LRSN Enabled
- LRSN Disabled

## LRSN Enabled

To switch CDRs from HDD to GSS with LRSN enabled:



**Important:** This configuration change must be undertaken in a maintenance window, when the load is minimum.

**Step 1** Configure the GSS server, and ensure that GSS and GGSN have no connectivity issues.

- If configuring to the *default* GTPP group:

```
configure

    gtpp single-source centralized-lrsn-creation

    context <billing>

        gtpp charging-agent address <address>
        gtpp storage-server <address> port <port>
        gtpp max-cdrs 255 wait-time 300
        end

    show configuration | grep gtpp
```

- If configuring to a specific GTPP group:

```
configure

    gtpp single-source centralized-lrsn-creation

    context <billing>

        gtpp group <gtpp_group>
        gtpp charging-agent address <address>
        gtpp storage-server <address> port <port>
        gtpp max-cdrs 255 wait-time 300
```

```

        end

    show configuration | grep gtpp

```

**Step 2** Change the GTPP storage server mode to “Remote”.

- If configuring to the *default* GTPP group:

```

configure

context <billing>

gtpp storage-server mode remote

gtpp max-cdrs 255 wait-time 300

end

show configuration | grep gtpp

```

- If configuring to a specific GTPP group:

```

configure

context <billing>

gtpp group <gtpp_group>

gtpp storage-server mode remote

gtpp max-cdrs 255 wait-time 300

end

show configuration | grep gtpp

```



**Important:** Ensure that the file format, GTPP dictionary and LRSN Enabled are set properly on GSS in the *gss.cfg* file. Also, the correct version of GSS has to be installed and started on the Solaris machine.

**Step 3** Check and confirm that new CDRs are being written to files by GSS.

On the HDD side, remaining CDRs are immediately flushed to a CDR file. At this point, the transition is complete.

## LRSN Disabled

To switch CDRs from HDD to GSS with LRSN disabled:



**Important:** This configuration change must be undertaken in a maintenance window, when the load is minimum.

**Step 1** Configure the GSS server, and ensure that GSS and GGSN have no connectivity issues.

- If configuring to the *default* GTPP group:

```

configure

  context <billing>

    gtpp charging-agent address <address>
    gtpp storage-server <address> port <port>
    gtpp max-cdrs 255 wait-time 300
    end

show configuration | grep gtpp

```

- If configuring to a specific GTPP group:

```

configure

  context <billing>

    gtpp group <gtpp_group>
    gtpp charging-agent address <address>
    gtpp storage-server <address> port <port>
    gtpp max-cdrs 255 wait-time 300
    end

show configuration | grep gtpp

```

**Step 2** Change the GTPP storage server mode to “Remote”.

- If configuring to the *default* GTPP group:

```

configure

  context <billing>

    gtpp storage-server mode remote
    gtpp max-cdrs 255 wait-time 300
    end

show configuration | grep gtpp

```

- If configuring to a specific GTPP group:

```

configure

  context <billing>

    gtpp group <gtpp_group>
    gtpp storage-server mode remote

```

```
gtpp max-cdrs 255 wait-time 300
end
show configuration | grep gtpp
```

**Step 3** Check and confirm that new CDRs are being written to files by GSS.

On the HDD side, remaining CDRS are immediately flushed to a CDR file. At this point, the transition is complete.



**Important:** Ensure that the file format, GTPP dictionary and LRSN Disabled are set properly on GSS in the `gss.cfg` file. Also, the correct version of GSS has to be installed and started on the Solaris machine.

# Switching CDRs from GSS to HDD

This section describes how to switch CDRs from GSS to HDD with:

- [LRSN Enabled](#)
- [LRSN Disabled](#)

## LRSN Enabled

To switch CDRs from GSS to HDD with LRSN enabled:



**Important:** This configuration change must be undertaken in a maintenance window, when the load is minimum.

**Step 1** Ensure that GSS is up and running, and that GGSN is able to deliver CDRs to GSS.

Start the changes from a known good state.

**Step 2** Add the HDD configuration.

- If configuring to the *default* GTPP group:

```
configure

    gtpp single-source centralized-lrsn-creation

        context <billing>

            gtpp storage-server local file format
            <file_format_as_in_gss.cfg>

            gtpp storage-server local file rotation volume mb 40

            gtpp storage-server local file rotation cdr-count
            <max_CDR_per_file_as_in_gss.cfg>

            gtpp storage-server local file rotation time-interval
            <max_file_gen_period_as_in_gss.cfg>

            gtpp dictionary <gtpp_dict_as_in_gss.cfg>

            gtpp storage-server mode local

        end

    show configuration | grep gtpp
```



**Important:** Note that `gtpp storage-server mode local` must be added at the end.

- If configuring to a specific GTPP group:

```

configure

gtpp single-source centralized-lrsn-creation

context <billing>

gtpp storage-server local file format
<file_format_as_in_gss.cfg>

gtpp storage-server local file rotation volume mb 40

gtpp storage-server local file rotation cdr-count
<max_CDR_per_file_as_in_gss.cfg>

gtpp storage-server local file rotation time-interval
<max_file_gen_period_as_in_gss.cfg>

gtpp dictionary <gtpp_dict_as_in_gss.cfg>

gtpp storage-server mode local

end

show configuration | grep gtpp

```



**Important:** Note that `gtpp storage-server mode local` must be added at the end.

- Step 3** Ensure that GSS is still up and running so that already pending requests towards GSS are fully delivered. Without flushing out the existing pending requests to GSS, GGSN will not switch to HDD.
- Step 4** Check and confirm that new CDRs are being written to HDD.
- Step 5** On the GSS side, you must wait for the time period it takes for the hard file generation, so that remaining CDRs are flushed to CDR file.
- Step 6** At this point, the transition is complete and you can bring the GSS offline.

## LRSN Disabled

To switch CDRs from GSS to HDD with LRSN disabled:



**Important:** This configuration change must be undertaken in a maintenance window, when the load is minimum.

- Step 1** Ensure that GSS is up and running and GGSN is able to deliver CDRs to GSS.

Start the changes from a known good state.

**Step 2** Add the HDD configuration.

- If configuring to the *default* GTPP group:

```
configure

context <billing>

    gtpo storage-server local file format
    <file_format_as_in_gss.cfg>

    gtpo storage-server local file rotation volume mb 40

    gtpo storage-server local file rotation cdr-count
    <max_CDR_per_file_as_in_gss.cfg>

    gtpo storage-server local file rotation time-interval
    <max_file_gen_period_as_in_gss.cfg>

    gtpo dictionary <gtpp_dict_as_in_gss.cfg>

    gtpo storage-server mode local

    end

show configuration | grep gtpo
```



**Important:** Note that **gtpo storage-server mode local** must be added at the end.

- If configuring to a specific GTPP group:

```
configure

context <billing>

    gtpo group <gtpp_group>

    gtpo storage-server local file format
    <file_format_as_in_gss.cfg>

    gtpo storage-server local file rotation volume mb 40

    gtpo storage-server local file rotation cdr-count
    <max_CDR_per_file_as_in_gss.cfg>

    gtpo storage-server local file rotation time-interval
    <max_file_gen_period_as_in_gss.cfg>

    gtpo dictionary <gtpp_dict_as_in_gss.cfg>

    gtpo storage-server mode local

    end
```

```
show configuration | grep gtpp
```



**Important:** Note that **gtpp storage-server mode local** must be added at the end.

- Step 3** Ensure that GSS is still up and running so that already pending requests towards GSS is fully delivered. Without flushing out the existing pending requests to GSS, GGSN will not switch to HDD.
- Step 4** Check and confirm that new CDRs are being written to HDD.
- Step 5** On the GSS side, you must wait for the time period it takes for the hard file generation, so that remaining CDRs are flushed to CDR file.
- Step 6** At this point, the transition is complete and you can bring the GSS offline.



# Appendix D

## Diameter Attribute Quick Reference

---

This appendix presents Diameter attribute quick reference tables.

The following table describes the indicators used in the quick reference tables.

Indicator	Description
0	The AVP MUST NOT be present in the message.
0+	Zero or more instances of the AVP MAY be present in the message.
0-1	Zero or one instance of the AVP MAY be present in the message. If there are more than one instance of the AVP, it is considered an error.
1	One instance of the AVP MUST be present in the message.
1+	At least one instance of the AVP MUST be present in the message.

The following table describes the column headers in the quick reference tables.

Term	Expansion	Term	Expansion
ACA	AC-Answer	MEICR	ME-Identity-Check-Request
ACR	AC-Request	MAA	Multimedia-Auth-Answer
ASA	Abort-Session-Answer	MAR	Multimedia-Auth-Request
ASR	Abort-Session-Request	NA	Notify-Answer
AIA	Authentication-Information-Answer	NR	Notify-Request
AIR	Authentication-Information-Request	PUA	Profile-Update-Answer
AAA	Authorization-Authentication-Answer	PUR	Profile-Update-Request
AAR	Authorization-Authentication-Request	PUAM	Purge-UE-Answer-MME
CLA	Cancel-Location-Answer	PURM	Purge-UE-Request-MME
CLR	Cancel-Location-Request	PPA	Push-Profile-Answer
CEA	Capabilities-Exchange-Answer	PPR	Push-Profile-Request
CER	Capabilities-Exchange-Request	RAA	Re-Auth-Answer
CCA	Credit-Control-Answer	RAR	Re-Auth-Request
CCR	Credit-Control-Request	RTA	Registration-Termination-Answer
DSDA	Delete-Subscriber-Data-Answer	RTR	Registration-Termination-Request
DSDR	Delete-Subscriber-Data-Request	RA	Reset-Answer

Term	Expansion	Term	Expansion
DWA	Device-Watchdog-Answer	RR	Reset-Request
DWR	Device-Watchdog-Request	SAA	Server-Assignment-Answer
DEA	Diameter-EAP-Answer	SAR	Server-Assignment-Request
DER	Diameter-EAP-Request	STA	Session-Termination-Answer
DPA	Disconnect-Peer-Answer	STR	Session-Termination-Request
DPR	Disconnect-Peer-Request	ULA	Update-Location-Answer
ISDA	Insert-Subscriber-Data-Answer	ULR	Update-Location-Request
ISDR	Insert-Subscriber-Data-Request	UAA	User-Authorization-Answer
LIA	Location-Info-Answer	UAR	User-Authorization-Request
LIR	Location-Info-Request	UDA	User-Data-Answer
MEICA	ME-Identity-Check-Answer	UDR	User-Data-Request

## Standard 3GPP Gy (32.299) Dictionary

Attribute	AVP Code	Vendor-Id	AVP Type	M Flag	P Flag	ASA	ASR	CCA	CCR	RAA	RAR
3GPP2-BSID	9010	5535	OCTETSTRING	1	0	0	0	0-1	0-1	0	0
3GPP-Charging-Characteristics	13	10415	UTF8STRING	1	0	0	0	0-1	0-1	0	0
3GPP-Charging-Id	2	10415	UINT32	1	0	0	0	0-1	0-1	0	0
3GPP-GGSN-MCC-MNC	9	10415	UTF8STRING	1	0	0	0	0-1	0-1	0	0
3GPP-GPRS-QoS-Negotiated-Profile	5	10415	UTF8STRING	1	0	0	0	0-1	0-1	0	0
3GPP-IMSI-MCC-MNC	8	10415	UTF8STRING	1	0	0	0	0-1	0-1	0	0
3GPP-MS-TimeZone	23	10415	OCTETSTRING	1	0	0	0	0-1	0-1	0	0
3GPP-NSAPI	10	10415	UTF8STRING	1	0	0	0	0-1	0-1	0	0
3GPP-PDP-Type	3	10415	ENUM	1	0	0	0	0-1	0-1	0	0
3GPP-Quota-Consumption-Time	881	10415	UINT32	1	0	0	0	0-1	0-1	0	0
3GPP-Quota-Holding-Time	871	10415	UINT32	1	0	0	0	0-1	0-1	0	0
3GPP-RAT-Type	21	10415	OCTETSTRING	1	0	0	0	0-1	0-1	0	0
3GPP-Reporting-Reason	872	10415	ENUM	1	0	0	0	0+	0+	0	0
3GPP-Selection-Mode	12	10415	UTF8STRING	1	0	0	0	0-1	0-1	0	0
3GPP-Session-Stop-Indicator	11	10415	OCTETSTRING	1	0	0	0	0-1	0-1	0	0
3GPP-SGSN-MCC-MNC	18	10415	UTF8STRING	1	0	0	0	0-1	0-1	0	0
3GPP-Time-Quota-Threshold	868	10415	UINT32	1	0	0	0	0-1	0-1	0	0
3GPP-Unit-Quota-Threshold	1226	10415	UINT32	1	0	0	0	0-1	0-1	0	0
3GPP-User-Location-Info	22	10415	UTF8STRING	1	0	0	0	0-1	0-1	0	0
3GPP-Volume-Quota-Threshold	869	10415	UINT32	1	0	0	0	0-1	0-1	0	0
AF-Correlation-Information	1276	10415	GROUPED	1	0	0	0	0+	0+	0	0
Auth-Application-Id	258	0	UINT32	1	0	0	1	1	1	0	1
Called-Station-Id	30	0	OCTETSTRING	1	0	0	0	0-1	0-1	0	0
CC-Input-Octets	412	0	UINT64	1	0	0	0	0-1	0-1	0	0
CC-Output-Octets	414	0	UINT64	1	0	0	0	0-1	0-1	0	0
CC-Request-Number	415	0	UINT32	1	0	0	0	1	1	0	0
CC-Request-Type	416	0	ENUM	1	0	0	0	1	1	0	0
CC-Service-Specific-Units	417	0	UINT64	1	0	0	0	0-1	0-1	0	0
CC-Session-Failover	418	0	ENUM	1	0	0	0	0-1	0	0	0
CC-Time	420	0	UINT32	1	0	0	0	0-1	0-1	0	0
CC-Total-Octets	421	0	UINT64	1	0	0	0	0-1	0-1	0	0
CG-Address	846	10415	ADDRESS	1	0	0	0	0-1	0-1	0	0
Charging-Rule-Base-Name	1004	10415	UTF8STRING	1	0	0	0	0-1	0-1	0	0
Cost-Information	423	0	GROUPED	1	0	0	0	0-1	0	0	0
Credit-Control-Failure-Handling	427	0	ENUM	1	0	0	0	0-1	0	0	0
Destination-Host	293	0	DIAMIDENT	1	0	0	0-1	0	0-1	0	0-1

Attribute	AVP Code	Vendor-Id	AVP Type	M Flag	P Flag	ASA	ASR	CCA	CCR	RAA	RAR
Destination-Realm	283	0	DIAMIDENT	1	0	0	1	0	1	0	1
Direct-Debiting-Failure-Handling	428	0	ENUM	1	0	0	0	0-1	0	0	0
Dynamic-Address-Flag	2051	10415	ENUM	1	0	0	0	0-1	0-1	0	0
Envelope	1266	10415	GROUPED	1	0	0	0	0+	0+	0	0
Envelope-End-Time	1267	10415	TIME	1	0	0	0	0-1	0-1	0	0
Envelope-Reporting	1268	10415	ENUM	1	0	0	0	0-1	0-1	0	0
Envelope-Start-Time	1269	10415	TIME	1	0	0	0	1	1	0	0
Error-Message	281	0	UTF8STRING	0	0	0	0	0	0	0-1	0
Event-Timestamp	55	0	TIME	1	0	0	0	0	0-1	0	0
Failed-AVP	279	0	GROUPED	1	0	0+	0	0+	0	0+	0
Final-Unit-Indication	430	0	GROUPED	1	0	0	0	0-1	0-1	0	0
GGSN-Address	847	10415	ADDRESS	1	0	0	0	0-1	0-1	0	0
Granted-Service-Unit	431	0	GROUPED	1	0	0	0	0-1	0-1	0	0
G-S-U-Pool-Reference	457	0	GROUPED	1	0	0	0	0+	0+	0	0
Multiple-Services-Credit-Control	456	0	GROUPED	1	0	0	0	0+	0+	0	0
Multiple-Services-Indicator	455	0	ENUM	1	0	0	0	0	0-1	0	0
Offline-Charging	1278	10415	GROUPED	1	0	0	0	0-1	0-1	0	0
Origin-Host	264	0	DIAMIDENT	1	0	1	1	1	1	1	1
Origin-Realm	296	0	DIAMIDENT	1	0	1	1	1	1	1	1
Origin-State-Id	278	0	UINT32	1	0	0	0	0	0-1	0	0
PDN-Connection-ID	2050	10415	UINT32	1	0	0	0	0-1	0-1	0	0
PDP-Address	1227	10415	ADDRESS	1	0	0	0	0+	0+	0	0
PDP-Context-Type	1247	10415	ENUM	1	0	0	0	0-1	0-1	0	0
Proxy-Info	284	0	GROUPED	1	0	0	0	0+	0+	0	0
PS-Furnish-Charging-Information	865	10415	GROUPED	1	0	0	0	0-1	0-1	0	0
PS-Information	874	10415	GROUPED	1	0	0	0	0-1	0-1	0	0
QoS-Information	1016	10415	GROUPED	1	0	0	0	0-1	0-1	0	0
Rating-Group	432	0	UINT32	1	0	0	0	0-1	0-1	0	0-1
Re-Auth-Request-Type	285	0	ENUM	1	0	0	0	0	0	0	1
Redirect-Host	292	0	OCTETSTRING	1	0	0	0	0+	0	0	0
Redirect-Host-Usage	261	0	ENUM	1	0	0	0	0-1	0	0	0
Redirect-Max-Cache-Time	262	0	UINT32	1	0	0	0	0-1	0	0	0
Requested-Action	436	0	ENUM	1	0	0	0	0	0-1	0	0
Requested-Service-Unit	437	0	GROUPED	1	0	0	0	0-1	0-1	0	0
Result-Code	268	0	ENUM	1	0	1	0	1	0-1	1	0
Route-Record	282	0	DIAMIDENT	1	0	0	0	0+	0+	0	0
Service-Context-Id	461	0	UTF8STRING	1	0	0	0	0	1	0	0
Service-Identifier	439	0	UINT32	1	0	0	0	0+	0+	0	0-1
Service-Information	873	10415	GROUPED	1	0	0	0	0-1	0-1	0	0

Attribute	AVP Code	Vendor-Id	AVP Type	M Flag	P Flag	ASA	ASR	CCA	CCR	RAA	RAR
Serving-Node-Type	2047	10415	ENUM	1	0	0	0	0-1	0-1	0	0
Session-Id	263	0	UTF8STRING	1	0	1	1	1	1	1	1
SGSN-Address	1228	10415	ADDRESS	1	0	0	0	0-1	0-1	0	0
Start-Time	2041	10415	TIME	1	0	0	0	0-1	0-1	0	0
Stop-Time	2042	10415	TIME	1	0	0	0	0-1	0-1	0	0
Subscription-Id	443	0	GROUPED	1	0	0	0	0	0+	0	0
Tariff-Time-Change	451	0	TIME	1	0	0	0	0-1	0-1	0	0
Terminal-Information	6002	10415	GROUPED	1	0	0	0	0-1	0-1	0	0
Termination-Cause	295	0	ENUM	1	0	0	0	0	0-1	0	0
Time-Quota-Mechanism	1270	10415	GROUPED	1	0	0	0	0-1	0-1	0	0
Trigger	1264	10415	GROUPED	1	0	0	0	0-1	0-1	0	0
Used-Service-Unit	446	0	GROUPED	1	0	0	0	0+	0+	0	0
User-Equipment-Info	458	0	GROUPED	1	0	0	0	0-1	0-1	0	0
User-Name	1	0	UTF8STRING	1	0	0-1	0-1	0	0-1	0-1	0-1
Validity-Time	448	0	UINT32	1	0	0	0	0-1	0-1	0	0

## Standard Cx Dictionary

Attribute	AVP Code	Vendor-Id	AVP Type	M Flag	P Flag	LIA	LIR	MAA	MAR	PPA	PPR	RTA	RTR	SAA	SAR	UAA	UAR
3GPP-User-Data	606	10415	OCTETSTRING	1	0	0	0	0	0	0-1	0	0	0-1	0	0	0	0
Acct-Application-Id	259	0	UINT32	1	0	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Associated-Identities	632	10415	GROUPED	0	0	0	0	0	0	0	0	0-1	0-1	0-1	0-1	0-1	0-1
Auth-Application-Id	258	0	UINT32	1	0	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Auth-Session-State	277	0	ENUM	1	0	1	1	1	1	1	1	1	1	1	1	1	1
Charging-Information	618	10415	GROUPED	1	0	0	0	0	0	0	0-1	0	0	0-1	0	0	0
Confidentiality-Key	625	10415	OCTETSTRING	1	0	0	0	0-1	0-1	0	0	0	0	0	0	0	0
Deregistration-Reason	615	10415	GROUPED	1	0	0	0	0	0	0	0	0	1	0	0	0	0
Destination-Host	293	0	DIAMIDENT	1	0	0	0-1	0	0-1	0	1	0	1	0	0-1	0	0-1
Destination-Realm	283	0	DIAMIDENT	1	0	0	1	0	1	0	1	0	1	0	1	0	1
Experimental-Result	297	0	GROUPED	1	0	0-1	0	0-1	0	0-1	0	0-1	0	0-1	0	0-1	0
Experimental-Result-Code	298	0	ENUM	1	0	1	0	1	0	1	0	1	0	1	0	1	0
Failed-AVP	279	0	GROUPED	1	0	0+	0	0+	0	0+	0	0+	0	0+	0	0+	0
Feature-List	630	10415	UINT32	0	0	1	1	1	1	1	1	1	1	1	1	1	1
Feature-List-ID	629	10415	UINT32	0	0	1	1	1	1	1	1	1	1	1	1	1	1
Framed-Interface-Id	96	0	UINT64	1	0	0	0	0-1	0-1	0	0	0	0	0	0	0	0
Framed-IP-Address	8	0	OCTETSTRING	1	0	0	0	0-1	0-1	0	0	0	0	0	0	0	0
Framed-IPv6-Prefix	97	0	OCTETSTRING	1	0	0	0	0-1	0-1	0	0	0	0	0	0	0	0
Integrity-Key	626	10415	OCTETSTRING	1	0	0	0	0-1	0-1	0	0	0	0	0	0	0	0
Mandatory-Capability	604	10415	UINT32	1	0	0+	0	0	0	0	0	0	0	0	0	0+	0
Optional-Capability	605	10415	UINT32	1	0	0+	0	0	0	0	0	0	0	0	0	0+	0
Originating-Request	633	10415	ENUM	1	0	0	0-1	0	0	0	0	0	0	0	0	0	0
Origin-Host	264	0	DIAMIDENT	1	0	1	1	1	1	1	1	1	1	1	1	1	1
Origin-Realm	296	0	DIAMIDENT	1	0	1	1	1	1	1	1	1	1	1	1	1	1
Primary-Charging-Collection-Function-Name	621	10415	DIAMURI	1	0	0	0	0	0	0	0-1	0	0	0-1	0	0	0
Primary-Event-Charging-Function-Name	619	10415	DIAMURI	1	0	0	0	0	0	0	0-1	0	0	0-1	0	0	0
Proxy-Host	280	0	DIAMIDENT	1	0	1	1	1	1	1	1	1	1	1	1	1	1
Proxy-Info	284	0	GROUPED	1	0	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+
Proxy-State	33	0	OCTETSTRING	1	0	1	1	1	1	1	1	1	1	1	1	1	1
Public-Identity	601	10415	UTF8STRING	1	0	0	1	0-1	1	0	0	0	0+	0	0+	0	1
Reason-Code	616	10415	ENUM	1	0	0	0	0	0	0	0	0	1	0	0	0	0
Reason-Info	617	10415	UTF8STRING	1	0	0	0	0	0	0	0	0	0-1	0	0	0	0
Redirect-Host	292	0	DIAMURI	1	0	0+	0	0+	0	0	0	0	0	0+	0	0+	0
Redirect-Host-Usage	261	0	ENUM	1	0	0-1	0	0-1	0	0	0	0	0	0-1	0	0-1	0
Result-Code	268	0	ENUM	1	0	0-1	0	0-1	0	0-1	0	0-1	0	0-1	0	0-1	0
Route-Record	282	0	DIAMIDENT	1	0	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+
Secondary-Charging-Collection-Function-Name	622	10415	DIAMURI	1	0	0	0	0	0	0	0-1	0	0	0-1	0	0	0
Secondary-Event-Charging-Function-Name	620	10415	DIAMURI	1	0	0	0	0	0	0	0-1	0	0	0-1	0	0	0
Server-Assignment-Type	614	10415	ENUM	1	0	0	0	0	0	0	0	0	0	0	0	1	0
Server-Capabilities	603	10415	GROUPED	1	0	0-1	0	0	0	0	0	0	0	0	0	0-1	0
Server-Name	602	10415	UTF8STRING	1	0	0-1	0	0	1	0	0	0	0	0	1	0-1	0
Session-Id	263	0	UTF8STRING	1	0	1	1	1	1	1	1	1	1	1	1	1	1
SIP-Auth-Data-Item	612	10415	GROUPED	1	0	0	0	0+	0-1	0	0	0	0	0	0	0	0
SIP-Authenticate	609	10415	OCTETSTRING	1	0	0	0	0-1	0-1	0	0	0	0	0	0	0	0
SIP-Authentication-Context	611	10415	OCTETSTRING	1	0	0	0	0-1	0-1	0	0	0	0	0	0	0	0
SIP-Authentication-Scheme	608	10415	UTF8STRING	1	0	0	0	0-1	0-1	0	0	0	0	0	0	0	0
SIP-Authorization	610	10415	OCTETSTRING	1	0	0	0	0-1	0-1	0	0	0	0	0	0	0	0
SIP-Digest-Authenticate	635	10415	GROUPED	1	0	0	0	0-1	0-1	0	0	0	0	0	0	0	0
SIP-Item-Number	613	10415	UINT32	1	0	0	0	0-1	0-1	0	0	0	0	0	0	0	0
SIP-Number-Auth-Items	607	10415	UINT32	1	0	0	0	0-1	0-1	0	0	0	0	0	0	0	0
Supported-Applications	631	10415	GROUPED	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Attribute	AVP Code	Vendor-Id	AVP Type	M Flag	P Flag	LIA	LIR	MAA	MAR	PPA	PPR	RTA	RTR	SAA	SAR	UAA	UAR
Supported-Features	628	10415	GROUPED	1	0	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+
UAR-Flags	637	10415	UINT32	0	0	0	0	0	0	0	0	0	0	0	0	0	0-1
User-Authorization-Type	623	10415	ENUM	1	0	0	0	0	0	0	0	0	0	0	0	0	0-1
User-Data-Already-Available	624	10415	ENUM	1	0	0	0	0	0	0	0	0	0	0	1	0	0
User-Name	1	0	UTF8STRING	1	0	0	0	0-1	1	0	1	0+	1	0-1	0-1	0	1
Vendor-Id	266	0	UINT32	1	0	1	1	1	1	1	1	1	1	1	1	1	1
Vendor-Specific-Application-Id	260	0	GROUPED	1	0	1	1	1	1	1	1	1	1	1	1	1	1
Visited-Network-Identifier	600	10415	OCTETSTRING	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Wildcared-PSI	634	10415	UTF8STRING	0	0	0-1	0	0	0	0	0	0	0	0	0-1	0	0

## Standard Sh/HSS Dictionary

Attribute	AVP Code	Vendor-Id	AVP Type	M Flag	P Flag	PUA	PUR	PNA	PNR	SNA	SNR	UDA	UDR
Auth-Session-State	277	0	ENUM	1	0	1	1	1	1	1	1	1	1
Current-Location	707	10415	ENUM	1	0	0	0	0	0	0	0-1	0	0-1
Data-Reference	703	10415	ENUM	1	0	0	1	0	1	0	1	0	1
Destination-Host	293	0	DIAMIDENT	1	0	0	0-1	0	0-1	0	0-1	0	0-1
Destination-Realm	283	0	DIAMIDENT	1	0	0	1	0	1	0	1	0	1
Experimental-Result	297	0	GROUPED	1	0	0-1	0	0-1	0	0-1	0	0-1	0
Experimental-Result-Code	298	0	ENUM	1	0	1	0	1	0	1	0	1	0
Failed-AVP	279	0	GROUPED	1	0	0+	0	0+	0	0+	0	0+	0
Feature-List	630	10415	UINT32	0	0	1	1	1	1	1	1	1	1
Feature-List-ID	629	10415	UINT32	0	0	1	1	1	1	1	1	1	1
Identity-Set	708	10415	ENUM	0	0	0	0	0	0	0	0-1	0	0-1
MSISDN	701	10415	OCTETSTRING	1	0	0	0-1	0	0-1	0	0-1	0	0-1
Origin-Host	264	0	DIAMIDENT	1	0	1	1	1	1	1	1	1	1
Origin-Realm	296	0	DIAMIDENT	1	0	1	1	1	1	1	1	1	1
Proxy-Info	284	0	GROUPED	1	0	0+	0+	0+	0+	0+	0+	0+	0+
Public-Identity	601	10415	UTF8STRING	1	0	0	0-1	0	0-1	0	0-1	0	0-1
Requested-Domain	706	10415	ENUM	1	0	0	0	0	0	0	0-1	0	0-1
Result-Code	268	0	ENUM	1	0	0-1	0	0-1	0	0-1	0	0-1	0
Route-Record	282	0	DIAMIDENT	1	0	0+	0+	0+	0+	0+	0+	0+	0+
Send-Data-Indication	710	0	ENUM	1	0	0	0	0	0	0	0-1	0	0
Server-Name	602	10415	UTF8STRING	1	0	0	0	0	0	0	0-1	0	0-1
Service-Indication	704	10415	OCTETSTRING	1	0	0	0	0	0	0	0+	0	0-1
Session-Id	263	0	UTF8STRING	1	0	1	1	1	1	1	1	1	1
Subs-Req-Type	705	0	ENUM	1	0	0	0	0	0	0	0-1	0	0
Supported-Features	628	10415	GROUPED	1	0	0+	0+	0+	0+	0+	0+	0+	0+
User-Data	702	10415	OCTETSTRING	1	0	0	1	0	1	0-1	0	0-1	0
User-Identity	700	10415	GROUPED	1	0	0	1	0	1	0	1	0	1
User-Name	1	0	UTF8STRING	1	0	0	0-1	0	0-1	0	0	0	0
Vendor-Id	266	0	UINT32	1	0	1	1	1	1	1	1	1	1
Vendor-Specific-Application-Id	260	0	GROUPED	1	0	1	1	1	1	1	1	1	1

## Standard Gmb Proxy Interface Dictionary

Attribute	AVP Code	Vendor-Id	AVP Type	M Flag	P Flag	ASA	ASR	AAA	AAR	RAA	RAR	STA	STR
3GPP-IMEISV	20	10415	OCTETSTRING	1	0	0	0	0	0-1	0	0	0	0
3GPP-IMSI	1	10415	UTF8STRING	1	0	0	0	0-1	0-1	0	0	0	0
3GPP-MS-TimeZone	23	10415	OCTETSTRING	1	0	0	0	0	0-1	0	0	0	0
3GPP-RAT-Type	21	10415	OCTETSTRING	1	0	0	0	0	0-1	0	0	0	0
3GPP-SGSN-Address	6	10415	OCTETSTRING	1	0	0	0	0	0	0	0+	0	0
3GPP-User-Location-Info	22	10415	UTF8STRING	1	0	0	0	0	0-1	0	0	0	0
Additional-MBMS-Trace-Info	910	10415	OCTETSTRING	1	0	0	0	0	0-1	0	0	0	0-1
Alternative-APN	905	10415	UTF8STRING	1	0	0	0	0-1	0	0	0	0	0
Auth-Application-Id	258	0	UINT32	1	0	0	1	1	1	0	1	0	1
Auth-Request-Type	274	0	ENUM	1	0	0	0	0	1	0	0	0	0
Called-Station-Id	30	0	OCTETSTRING	1	0	0	0	0	0-1	0	0-1	0	0
Calling-Station-Id	31	0	UTF8STRING	1	0	0	0	0	0-1	0	0	0	0
Class	25	0	OCTETSTRING	1	0	0	0	0	0	0	0	0+	0+
Destination-Host	293	0	DIAMIDENT	1	0	0	1	0	0-1	0	1	0	0-1
Destination-Realm	283	0	DIAMIDENT	1	0	0	1	0	1	0	1	0	1
Error-Message	281	0	UTF8STRING	0	0	0-1	0	0-1	0	0-1	0	0-1	0
Error-Reporting-Host	294	0	DIAMIDENT	1	0	0-1	0	0-1	0	0-1	0	0-1	0
Experimental-Result	297	0	GROUPED	1	0	0	0	0-1	0	0-1	0	0	0
Failed-AVP	279	0	GROUPED	1	0	0+	0	0+	0	0+	0	0+	0
Framed-Interface-Id	96	0	UINT64	1	0	0	0	0	0-1	0	0-1	0	0
Framed-IP-Address	8	0	OCTETSTRING	1	0	0	0	0	0-1	0	0-1	0	0
Framed-IPv6-Prefix	97	0	OCTETSTRING	1	0	0	0	0	0-1	0	0-1	0	0
MBMS-2G-3G-Indicator	907	10415	ENUM	1	0	0	0	0	0	0	0-1	0	0
MBMS-BMSC-SSM-IP-Address	918	10415	UTF8STRING	1	0	0	0	0	0	0	0-1	0	0
MBMS-BMSC-SSM-IPv6-Address	919	10415	UTF8STRING	1	0	0	0	0	0	0	0-1	0	0
MBMS-Counting-Information	914	10415	ENUM	1	0	0	0	0	0	0	0-1	0	0
MBMS-GGSN-Address	916	10415	UTF8STRING	1	0	0	0	0	0	0	0-1	0	0
MBMS-GGSN-IPv6-Address	917	10415	UTF8STRING	1	0	0	0	0	0	0	0-1	0	0
MBMS-Required-QoS	913	10415	UTF8STRING	1	0	0	0	0	0	0	0-1	0	0
MBMS-Service-Area	903	10415	OCTETSTRING	1	0	0	0	0	0	0	0-1	0	0
MBMS-Service-Type	906	10415	ENUM	1	0	0	0	0	0	0	0-1	0	0
MBMS-Session-Duration	904	10415	OCTETSTRING	1	0	0	0	0	0	0	0-1	0	0
MBMS-Session-Identity	908	10415	OCTETSTRING	1	0	0	0	0	0	0	0-1	0	0
MBMS-Session-Repetition-number	912	10415	OCTETSTRING	1	0	0	0	0	0	0	0-1	0	0
MBMS-StartStop-Indication	902	10415	ENUM	1	0	0	0	0	0	0	0-1	0-1	0
MBMS-Time-To-Data-Transfer	911	10415	OCTETSTRING	1	0	0	0	0	0	0	0-1	0	0
MBMS-User-Data-Mode-Indication	915	10415	ENUM	1	0	0	0	0	0	0	0-1	0-1	0
Origin-Host	264	0	DIAMIDENT	1	0	1	1	1	1	1	1	1	1
Origin-Realm	296	0	DIAMIDENT	1	0	1	1	1	1	1	1	1	1
Origin-State-Id	278	0	UINT32	1	0	0-1	0-1	0	0	0-1	0-1	0-1	0-1
Proxy-Info	284	0	GROUPED	1	0	0+	0+	0+	0+	0+	0+	0+	0+

Attribute	AVP Code	Vendor-Id	AVP Type	M Flag	P Flag	ASA	ASR	AAA	AAR	RAA	RAR	STA	STR
RAI	909	10415	UTF8STRING	1	0	0	0	0	0-1	0	0	0	0
Re-Auth-Request-Type	285	0	ENUM	1	0	0	0	0	0	0	1	0	0
Redirect-Host	292	0	OCTETSTRING	1	0	0+	0	0	0	0+	0	0+	0
Redirect-Host-Usage	261	0	ENUM	1	0	0-1	0	0	0	0-1	0	0-1	0
Redirect-Max-Cache-Time	262	0	UINT32	1	0	0-1	0	0	0	0-1	0	0-1	0
Required-MBMS-Bearer-Capabilities	901	10415	UTF8STRING	1	0	0	0	0-1	0	0	0	0	0
Result-Code	268	0	ENUM	1	0	1	0	0-1	0	0-1	0	1	0
Route-Record	282	0	DIAMIDENT	1	0	0	0+	0	0+	0	0+	0	0+
Session-Id	263	0	UTF8STRING	1	0	1	1	1	1	1	1	1	1
Termination-Cause	295	0	ENUM	1	0	0	0	0	0	0	0	0	1
TMGI	900	10415	OCTETSTRING	1	0	0	0	0-1	0	0	0-1	0	0

## Standard Rel. 7 Gx Dictionary

Attribute	AVP Code	Vendor-Id	AVP Type	M Flag	P Flag	ASA	ASR	CEA	CER	CCA	CCR	DWA	DWR	DPA	DPR	RAA	RAR
3GPP-MS-TimeZone	23	10415	OCTETSTRING	1	0	0	0	0	0	0	0-1	0	0	0	0	0	0
3GPP-RAT-Type	21	10415	OCTETSTRING	1	0	0	0	0	0	0	0-1	0	0	0	0	0-1	0
3GPP-SGSN-Address	6	10415	OCTETSTRING	1	0	0	0	0	0	0	0-1	0	0	0	0	0-1	0
3GPP-SGSN-IPv6-Address	15	10415	OCTETSTRING	1	0	0	0	0	0	0	0	0	0	0	0	0-1	0
3GPP-SGSN-MCC-MNC	18	10415	UTF8STRING	1	0	0	0	0	0	0	0-1	0	0	0	0	0-1	0
3GPP-User-Location-Info	22	10415	UTF8STRING	1	0	0	0	0	0	0	0-1	0	0	0	0	0-1	0
Access-Network-Charging-Address	501	10415	ADDRESS	1	0	0	0	0	0	0	0-1	0	0	0	0	0-1	0
Access-Network-Charging-Identifier-Gx	1022	10415	GROUPED	1	0	0	0	0	0	0	0+	0	0	0	0	0+	0
Acct-Application-Id	259	0	UINT32	1	0	0	0	0	0+	0+	0	0	0	0	0	0	0
Auth-Application-Id	258	0	UINT32	1	0	1	1	0+	0+	1	1	0	0	0	0	0	1
Bearer-Control-Mode	1023	10415	ENUM	1	0	0	0	0	0	0	0-1	0	0	0	0	0	0
Bearer-Identifier	1020	10415	OCTETSTRING	1	0	0	0	0	0	0-1	0-1	0	0	0	0	0	0-1
Bearer-Operation	1021	10415	ENUM	1	0	0	0	0	0	0	0-1	0	0	0	0	0	0
Bearer-Usage	1000	10415	ENUM	1	0	0	0	0	0	0	0-1	0	0	0	0	0	0
Called-Station-Id	30	0	OCTETSTRING	1	0	0	0	0	0	0	0-1	0	0	0	0	0	0
CC-Request-Number	415	0	UINT32	1	0	0	0	0	0	1	1	0	0	0	0	0	0
CC-Request-Type	416	0	ENUM	1	0	0	0	0	0	1	1	0	0	0	0	0	0
Charging-Information	618	10415	GROUPED	1	0	0	0	0	0	0-1	0	0	0	0	0	0	0
Charging-Rule-Base-Name	1004	10415	UTF8STRING	1	0	0	0	0	0	0	0+	0+	0	0	0	0+	0+
Charging-Rule-Definition	1003	10415	GROUPED	1	0	0	0	0	0	0	0+	0	0	0	0	0	0+
Charging-Rule-Install	1001	10415	GROUPED	1	0	0	0	0	0	0	0+	0	0	0	0	0	0+
Charging-Rule-Name	1005	10415	OCTETSTRING	1	0	0	0	0	0	0	0+	0+	0	0	0	0+	0+
Charging-Rule-Remove	1002	10415	GROUPED	1	0	0	0	0	0	0	0+	0	0	0	0	0	0+
Charging-Rule-Report	1018	10415	GROUPED	1	0	0	0	0	0	0	0+	0	0	0	0	0+	0
Destination-Host	293	0	DIAMIDENT	1	0	0	0-1	0	0	0	0-1	0	0	0	0	0	1
Destination-Realm	283	0	DIAMIDENT	1	0	0	1	0	0	0	1	0	0	0	0	0	1
Disconnect-Cause	273	0	ENUM	1	0	0	0	0	0	0	0	0	0	0	0	1	0
Error-Message	281	0	UTF8STRING	0	0	0	0	0-1	0	0-1	0	0-1	0	0-1	0	0-1	0
Error-Reporting-Host	294	0	DIAMIDENT	1	0	0	0	0	0	0	0-1	0	0	0	0	0-1	0
Event-Trigger	1006	10415	ENUM	1	0	0	0	0	0	0	0+	0+	0	0	0	0	0+
Experimental-Result	297	0	GROUPED	1	0	0	0	0	0	0	0-1	0	0	0	0	0-1	0
Failed-AVP	279	0	GROUPED	1	0	0	0	0	0	0+	0	0+	0	0-1	0	0+	0
Final-Unit-Indication	430	0	GROUPED	1	0	0	0	0	0	0	0	0-1	0	0	0	0	0-1
Firmware-Revision	267	0	UINT32	0	0	0	0	0-1	0-1	0	0	0	0	0	0	0	0
Framed-IP-Address	8	0	OCTETSTRING	1	0	0	0	0	0	0	0-1	0	0	0	0	0	0
Framed-IPv6-Prefix	97	0	OCTETSTRING	1	0	0	0	0	0	0	0-1	0	0	0	0	0	0
Granted-Service-Unit	431	0	GROUPED	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Guaranteed-Bitrate-DL	1025	10415	UINT32	1	0	0	0	0	0	0	0-1	0-1	0	0	0	0	0-1
Guaranteed-Bitrate-UL	1026	10415	UINT32	1	0	0	0	0	0	0	0-1	0-1	0	0	0	0	0-1
Host-IP-Address	257	0	ADDRESS	1	0	0	0	0	0+	0+	0	0	0	0	0	0	0
Inband-Security-Id	299	0	ENUM	1	0	0	0	0	0+	0+	0	0	0	0	0	0	0
IP-CAN-Type	1027	10415	ENUM	1	0	0	0	0	0	0	0-1	0	0	0	0	0-1	0
Max-Requested-Bandwidth-DL	515	10415	UINT32	1	0	0	0	0	0	0	0-1	0-1	0	0	0	0	0-1
Max-Requested-Bandwidth-UL	516	10415	UINT32	1	0	0	0	0	0	0	0-1	0-1	0	0	0	0	0-1
Network-Request-Support	1024	10415	ENUM	1	0	0	0	0	0	0	0-1	0	0	0	0	0	0
Offline	1008	10415	ENUM	1	0	0	0	0	0	0	0-1	0-1	0	0	0	0	0
Online	1009	10415	ENUM	1	0	0	0	0	0	0	0-1	0-1	0	0	0	0	0
Origin-Host	264	0	DIAMIDENT	1	0	1	1	1	1	1	1	1	1	1	1	1	1
Origin-Realm	296	0	DIAMIDENT	1	0	1	1	1	1	1	1	1	1	1	1	1	1
Origin-State-Id	278	0	UINT32	1	0	0	0	0-1	0-1	0-1	0-1	0-1	0-1	0	0	0-1	0-1
PCC-Rule-Status	1019	10415	ENUM	1	0	0	0	0	0	0	0-1	0	0	0	0	0-1	0

Attribute	AVP Code	Vendor-Id	AVP Type	M Flag	P Flag	ASA	ASR	CEA	CER	CCA	CCR	DWA	DWR	DPA	DPR	RAA	RAR
Precedence	1010	10415	UINT32	1	0	0	0	0	0	0	0-1	0	0	0	0	0	0
Primary-Charging-Collection-Function-Name	621	10415	DIAMURI	1	0	0	0	0	0	0-1	0	0	0	0	0	0	0
Primary-Event-Charging-Function-Name	619	10415	DIAMURI	1	0	0	0	0	0	0-1	0	0	0	0	0	0	0
Product-Name	269	0	UTF8STRING	0	0	0	0	1	1	0	0	0	0	0	0	0	0
Proxy-Info	284	0	GROUPED	1	0	0	0	0	0	0+	0+	0	0	0	0	0+	0+
QoS-Class-Identifier	1028	10415	ENUM	1	0	0	0	0	0	0-1	0-1	0	0	0	0	0	0-1
QoS-Information	1016	10415	GROUPED	1	0	0	0	0	0	0-1	0-1	0	0	0	0	0	0-1
QoS-Negotiation	1029	10415	ENUM	1	0	0	0	0	0	0	0-1	0	0	0	0	0	0
QoS-Upgrade	1030	10415	ENUM	1	0	0	0	0	0	0	0-1	0	0	0	0	0	0
RAI	909	10415	UTF8STRING	1	0	0	0	0	0	0	0-1	0	0	0	0	0-1	0
Re-Auth-Request-Type	285	0	ENUM	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Result-Code	268	0	ENUM	1	0	1	0	1	0	0-1	0	1	0	1	0	0-1	0
Revalidation-Time	1042	10415	TIME	1	0	0	0	0	0	0-1	0	0	0	0	0	0	0-1
Route-Record	282	0	DIAMIDENT	1	0	0	0	0	0	0+	0+	0	0	0	0	0	0+
Rule-Activation-Time	1043	10415	TIME	1	0	0	0	0	0	0-1	0	0	0	0	0	0	0-1
Rule-Deactivation-Time	1044	10415	TIME	1	0	0	0	0	0	0-1	0	0	0	0	0	0	0-1
Rule-Failure-Code	1031	10415	ENUM	1	0	0	0	0	0	0	0-1	0	0	0	0	0-1	0
Secondary-Charging-Collection-Function-Name	622	10415	DIAMURI	1	0	0	0	0	0	0-1	0	0	0	0	0	0	0
Secondary-Event-Charging-Function-Name	620	10415	DIAMURI	1	0	0	0	0	0	0-1	0	0	0	0	0	0	0
Session-Id	263	0	UTF8STRING	1	0	1	1	0	0	1	1	0	0	0	0	1	1
Session-Release-Cause	1045	10415	ENUM	1	0	0	0	0	0	0	0	0	0	0	0	0	0-1
Subscription-Id	443	0	GROUPED	1	0	0	0	0	0	0	0+	0	0	0	0	0	0
Supported-Features	628	10415	GROUPED	1	0	0	0	0	0	0+	0+	0	0	0	0	0	0
Supported-Vendor-Id	265	0	UINT32	1	0	0	0	0+	0+	0	0	0	0	0	0	0	0
Termination-Cause	295	0	ENUM	1	0	0	0	0	0	0	0-1	0	0	0	0	0	0
TFT-Filter	1012	10415	IPFILTERRULE	1	0	0	0	0	0	0	0-1	0	0	0	0	0	0
TFT-Packet-Filter-Information	1013	10415	GROUPED	1	0	0	0	0	0	0	0+	0	0	0	0	0	0
ToS-Traffic-Class	1014	10415	OCTETSTRING	1	0	0	0	0	0	0	0-1	0	0	0	0	0	0
Usage-Monitoring-Information	1067	10415	GROUPED	0	0	0	0	0	0	0+	0+	0	0	0	0	0	0+
Used-Service-Unit	446	0	GROUPED	0	0	0	0	0	0	0	0	0	0	0	0	0	0
User-Equipment-Info	458	0	GROUPED	1	0	0	0	0	0	0	0-1	0	0	0	0	0	0
User-Name	1	0	UTF8STRING	1	0	0-1	0-1	0	0	0	0	0	0	0	0	0	0
Vendor-Id	266	0	UINT32	1	0	0	0	1	1	0	0	0	0	0	0	0	0
Vendor-Specific-Application-Id	260	0	GROUPED	1	0	0	0	0+	0+	0	0	0	0	0	0	0	0

Standard S6a Dictionary 3GPP 29.272

Attribute	AVP Code	Vendor-Id	AVP Type	M Flag	P Flag	AIA	AIR	CLA	CLR	DSDA	DSDR	ISDA	ISDR	NA	NR	PUAM	PURM	RA	RR	ULA	ULR
PDN-GW-Identity	6044	10415	GROUPED	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PDP-Context	1469	10415	GROUPED	1	0	0	0	0	0	0	0	0	0+	0	0	0	0	0	0	0+	0
PLMN-Client	1482	10415	ENUM	1	0	0	0	0	0	0	0	0	0+	0	0	0	0	0	0	0+	0
Proxy-Info	284	0	GROUPED	1	0	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+
PUA-Flags	1442	10415	UINT32	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
RAND	1447	10415	OCTETSTRING	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RAT-Frequency-Selection-Priority	1440	10415	UINT32	1	0	0	0	0	0	0	0	0	0-1	0	0	0	0	0	0	0-1	0
RAT-Type	1032	10415	ENUM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Regional-Subscription-Zone-Code	1446	10415	OCTETSTRING	1	0	0	0	0	0	0	0	0	0+	0	0	0	0	0	0	0+	0
Requested-EUTRAN-Authentication-Info	1408	10415	GROUPED	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Requested-GERAN-Authentication-Info	6012	10415	GROUPED	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Requested-UTRAN-GERAN-Authentication-Info	1409	10415	GROUPED	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Requesting-Node-Type	1455	10415	ENUM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Result-Code	268	0	ENUM	1	0	0-1	0	0-1	0	0-1	0	0-1	0	0-1	0	0-1	0	0-1	0	0-1	0
Re-Synchronization-Info	1411	10415	OCTETSTRING	1	0	0	0-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Roaming-Restricted-Due-To-Unsupported-Feature	1461	10415	ENUM	1	0	0	0	0	0	0	0	0	0-1	0	0	0	0	0	0	0-1	0
Route-Record	282	0	DIAMIDENT	1	0	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+
Service-Selection	493	0	OCTETSTRING	1	0	0	0	0	0	0	0	0	0	0	0	0-1	0	0	0	0	0
ServiceTypeIdentity	1484	10415	UINT32	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Session-Id	263	0	UTF8STRING	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SGSN-Number	1489	10415	OCTETSTRING	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0-1
Software-Version	1403	10415	UTF8STRING	1	0	0	0	0	0	0	0	0	0	0	0	0-1	0	0	0	0	0-1
Specific-APN-Info	1472	10415	GROUPED	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SS-Code	1478	10415	OCTETSTRING	1	0	0	0	0	0	0	0	0-1	0	1	0	0	0	0	0	0	1
SS-Status	1477	10415	OCTETSTRING	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
STN-SR	1433	10415	UTF8STRING	1	0	0	0	0	0	0	0	0	0	0-1	0	0	0	0	0	0	0-1
Subscriber-Status	1424	10415	ENUM	1	0	0	0	0	0	0	0	0	0	0-1	0	0	0	0	0	0	0-1
Subscription-Data	1400	10415	GROUPED	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0-1
Supported-Features	628	10415	GROUPED	1	0	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+	0-	0+	0+
Teleservice-List	1486	10415	GROUPED	1	0	0	0	0	0	0	0	0	0	0-1	0	0	0	0	0	0	0-1
Terminal-Information	1401	10415	GROUPED	1	0	0	0	0	0	0	0	0	0	0	0	0-1	0	0	0	0	0-1
Trace-Collection-Entity	1452	10415	ADDRESS	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Trace-Data	1458	10415	GROUPED	1	0	0	0	0	0	0	0	0	0	0-1	0	0	0	0	0	0	0-1
Trace-Depth	1462	10415	ENUM	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Trace-Depth-List	1460	10415	GROUPED	1	0	0	0	0	0	0	0	0	0-1	0	0	0	0	0	0	0	0-1
Trace-Depth-Per-NE-Type	7015	10415	GROUPED	1	0	0	0	0	0	0	0	0	0+	0	0	0	0	0	0	0	0+
Trace-Event-List	1465	10415	OCTETSTRING	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Trace-Interface-List	1464	10415	OCTETSTRING	1	0	0	0	0	0	0	0	0	0	0-1	0	0	0	0	0	0	0-1
Trace-NE-Type-List	1463	10415	OCTETSTRING	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Trace-Reference	1459	10415	OCTETSTRING	1	0	0	0	0	0	0	0	0-1	0	1	0	0	0	0	0	0	1
TS-Code	1487	10415	OCTETSTRING	1	0	0	0	0	0	0	0	0	0+	0	0	0	0	0	0	0	0+
ULA-Flags	1406	10415	UINT32	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
ULR-Flags	1405	10415	UINT32	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
User-Id	1444	10415	UTF8STRING	1	0	0	0	1	0	1	0	1	0	1	0	1	0	1	0	0	0
User-Name	1	0	UTF8STRING	1	0	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
UTRAN-Vector	1415	10415	GROUPED	1	0	0+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vendor-Id	266	0	UINT32	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Vendor-Specific-Application-Id	260	0	GROUPED	1	0	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Visited-PLMN-Id	1407	10415</																			

## Standard S13 Dictionary 3GPP 29.272

Attribute	AVP Code	Vendor-Id	AVP Type	M Flag	P Flag	MICA	MICR
3GPP2-MEID	1471	10415	OCTETSTRING	1	0	0	0-1
Auth-Session-State	277	0	ENUM	1	0	1	1
Destination-Host	293	0	DIAMIDENT	1	0	0	0-1
Destination-Realm	283	0	DIAMIDENT	1	0	0	1
Equipment-Status	1445	10415	ENUM	1	0	0-1	0
Experimental-Result	297	0	GROUPED	1	0	0-1	0
Failed-AVP	279	0	GROUPED	1	0	0+	0
IMEI	1402	10415	UTF8STRING	1	0	0	0-1
Origin-Host	264	0	DIAMIDENT	1	0	1	1
Origin-Realm	296	0	DIAMIDENT	1	0	1	1
Proxy-Info	284	0	GROUPED	1	0	0+	0+
Result-Code	268	0	ENUM	1	0	0-1	0
Route-Record	282	0	DIAMIDENT	1	0	0+	0+
Session-Id	263	0	UTF8STRING	1	0	1	1
Software-Version	1403	10415	UTF8STRING	1	0	0	0-1
Terminal-Information	1401	10415	GROUPED	1	0	0	1
User-Name	1	0	UTF8STRING	1	0	0	0-1

## Standard S6b Dictionary 3GPP 29.273

Attribute	AVP Code	Vendor-Id	AVP Type	M Flag	P Flag	ASA	ASR	AAA	AAR	RAA	RAR	STA	STR
Auth-Application-Id	258	0	UINT32	1	0	0	1	1	1	0	1	0	1
Auth-Grace-Period	276	0	UINT32	1	0	0	0	0-1	0-1	0	0	0	0
Authorization-Lifetime	291	0	UINT32	1	0	0	0	0-1	0-1	0	0	0	0
Auth-Request-Type	274	0	ENUM	1	0	0	0	1	1	0	0	0	0
Auth-Session-State	277	0	ENUM	1	0	0	0	0-1	0-1	0	0	0	0
Class	25	0	OCTETSTRING	1	0	0	0+	0+	0	0+	0+	0+	0+
Destination-Host	293	0	DIAMIDENT	1	0	0	1	0	0-1	0	1	0	0-1
Destination-Realm	283	0	DIAMIDENT	1	0	0	1	0	1	0	1	0	1
Error-Message	281	0	UTF8STRING	0	0	0-1	0	0-1	0	0-1	0	0-1	0
Error-Reporting-Host	294	0	DIAMIDENT	1	0	0-1	0	0-1	0	0-1	0	0-1	0
Experimental-Result	297	0	GROUPED	1	0	0	0	0-1	0	0	0	0	0
Experimental-Result-Code	298	0	ENUM	1	0	0	0	1	0	0	0	0	0
Extended-QoS-Filter-Rule	6066	0	UINT32	1	0	0	0	0+	0	0	0	0	0
Failed-AVP	279	0	GROUPED	1	0	0+	0	0+	0	0+	0	0+	0
Feature-List	630	10415	UINT32	0	0	0	0	1	1	0	0	0	0
Feature-List-ID	629	10415	UINT32	0	0	0	0	1	1	0	0	0	0
Idle-Timeout	28	0	UINT32	1	0	0	0	0-1	0-1	0	0	0	0
MIP6-Agent-Info	486	0	GROUPED	1	0	0	0	0	0+	0	0	0	0
MIP6-Feature-Vector	124	0	UINT64	1	0	0	0	0-1	0-1	0	0	0	0
MIP6-Home-Link-Prefix	125	0	OCTETSTRING	1	0	0	0	0	0-1	0	0	0	0
MIP-Home-Agent-Address-IETF	334	0	ADDRESS	1	0	0	0	0	0+	0	0	0	0
MIP-Home-Agent-Host	348	0	GROUPED	1	0	0	0	0	0-1	0	0	0	0
Origin-Host	264	0	DIAMIDENT	1	0	1	1	1	1	1	1	1	1
Origin-Realm	296	0	DIAMIDENT	1	0	1	1	1	1	1	1	1	1
Origin-State-Id	278	0	UINT32	1	0	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Proxy-Host	280	0	DIAMIDENT	1	0	1	1	1	1	1	1	1	1
Proxy-Info	284	0	GROUPED	1	0	0+	0+	0+	0+	0+	0+	0+	0+
Proxy-State	33	0	OCTETSTRING	1	0	1	1	1	1	1	1	1	1
QoS-Capability	6063	0	GROUPED	1	0	0	0	0	0-1	0	0	0	0
QoS-Profile-Template	6067	0	UINT32	1	0	0	0	0	0+	0	0	0	0
QoS-Resources	6065	0	GROUPED	1	0	0	0	0-1	0	0	0	0	0
Re-Auth-Request-Type	285	0	ENUM	1	0	0	0	0-1	0	0	1	0	0
Redirect-Host	292	0	OCTETSTRING	1	0	0+	0	0+	0	0+	0	0+	0
Redirect-Host-Usage	261	0	ENUM	1	0	0-1	0	0-1	0	0-1	0	0-1	0
Redirect-Max-Cache-Time	262	0	UINT32	1	0	0-1	0	0-1	0	0-1	0	0-1	0
Reply-Message	18	0	UTF8STRING	1	0	0	0+	0	0	0	0	0	0
Result-Code	268	0	ENUM	1	0	1	0	1	0	1	0	1	0
Route-Record	282	0	DIAMIDENT	1	0	0	0+	0	0+	0	0+	0	0+
Service-Selection	493	0	OCTETSTRING	1	0	0	0	0	0-1	0	0	0	0
Session-Id	263	0	UTF8STRING	1	0	1	1	1	1	1	1	1	1
Session-Timeout	27	0	UINT32	1	0	0	0	0-1	0	0	0	0	0

Attribute	AVP Code	Vendor-Id	AVP Type	M Flag	P Flag	ASA	ASR	AAA	AAR	RAA	RAR	STA	STR
State	24	0	OCTETSTRING	1	0	0-1	0-1	0	0	0-1	0-1	0	0
Supported-Features	628	10415	GROUPED	1	0	0	0	0+	0+	0	0	0	0
Termination-Cause	295	0	ENUM	1	0	0	0	0	0	0	0	0	1
User-Name	1	0	UTF8STRING	1	0	0	0-1	0	0-1	0-1	0-1	0	0-1
Vendor-Id	266	0	UINT32	1	0	0	0	1	1	0	0	0	0
Vendor-Specific-QoS-Profile-Template	6064	0	GROUPED	1	0	0	0	0	0+	0	0	0	0

## Standard STa Dictionary 3GPP 29.273

Attribute	AVP Code	Vendor-Id	AVP Type	M Flag	P Flag	ASA	ASR	AAA	AAR	DEA	DER	RAA	RAR	STA	STR
3GPP-Charging-Characteristics	13	10415	UTF8STRING	1	0	0	0	0-1	0	0-1	0	0	0	0	0
AMBR	1435	10415	GROUPED	1	0	0	0	0-1	0	0-1	0	0	0	0	0
AN-Trusted	1503	10415	ENUM	1	0	0	0	0	0	0	0-1	0	0	0	0
ANID	1504	10415	UTF8STRING	1	0	0	0	0	0	0	0-1	0	0	0	0
APN-Configuration	1430	10415	GROUPED	1	0	0	0	0+	0	0+	0	0	0	0	0
APN-OI-Replacement	1427	10415	UTF8STRING	1	0	0	0	0-1	0	0-1	0	0	0	0	0
Acct-Interim-Interval	85	0	UINT32	0	0	0	0	0-1	0	0-1	0	0	0	0	0
Allocation-Retention-Priority	1034	10415	GROUPED	1	0	0	0	1	0	1	0	0	0	0	0
Auth-Application-Id	258	0	UINT32	1	0	0	1	1	1	1	1	0	1	0	1
Auth-Grace-Period	276	0	UINT32	1	0	0	0	0-1	0-1	0-1	0-1	0	0	0	0
Auth-Request-Type	274	0	ENUM	1	0	0	0	1	1	1	1	0	0	0	0
Auth-Session-State	277	0	ENUM	1	0	0	0	0-1	0-1	0-1	0-1	0	0	0	0
Authorization-Lifetime	291	0	UINT32	1	0	0	0	0-1	0-1	0-1	0-1	0	0	0	0
Calling-Station-Id	31	0	UTF8STRING	1	0	0	0	0	0	0	0-1	0	0	0	0
Class	25	0	OCTETSTRING	1	0	0	0+	0+	0	0+	0	0+	0+	0+	0+
Context-Identifier	1423	10415	UINT32	1	0	0	0	0-1	0	0-1	0	0	0	0	0
Destination-Host	293	0	DIAMIDENT	1	0	0	1	1	0-1	1	0-1	0	1	0	0-1
Destination-Realm	283	0	DIAMIDENT	1	0	0	1	1	1	1	1	0	1	0	1
EAP-Master-Session-Key	464	0	OCTETSTRING	1	0	0	0	0	0	0-1	0	0	0	0	0
EAP-Payload	462	0	OCTETSTRING	1	0	0	0	0	0	0	1	1	0	0	0
EPS-Subscribed-QoS-Profile	1431	10415	GROUPED	1	0	0	0	0-1	0	0-1	0	0	0	0	0
ESN	6109	10415	OCTETSTRING	1	0	0	0	0	0	0	0-1	0	0	0	0
Error-Message	281	0	UTF8STRING	0	0	0-1	0	0-1	0	0-1	0	0-1	0	0-1	0
Error-Reporting-Host	294	0	DIAMIDENT	1	0	0-1	0	0-1	0	0-1	0	0-1	0	0-1	0
Experimental-Result	297	0	GROUPED	1	0	0	0	0-1	0	0-1	0	0	0	0	0
Experimental-Result-Code	298	0	ENUM	1	0	0	0	1	0	1	0	0	0	0	0
Failed-AVP	279	0	GROUPED	1	0	0+	0	0+	0	0+	0	0+	0	0+	0
Feature-List	630	10415	UINT32	0	0	0	0	0	0	1	1	0	0	0	0
Feature-List-ID	629	10415	UINT32	0	0	0	0	0	0	1	1	0	0	0	0
IMEI	1402	10415	UTF8STRING	1	0	0	0	0	0	0	0-1	0	0	0	0
IP-MMS	6076	10415	UINT32	1	0	0	0	0	0	0	0-1	0	0	0	0
Idle-Timeout	28	0	UINT32	1	0	0	0	0-1	0	0-1	0	0	0	0	0
MEID	6110	10415	OCTETSTRING	1	0	0	0	0	0	0	0-1	0	0	0	0
MIP-Home-Agent-Address-IETF	334	0	ADDRESS	1	0	0	0	0+	0	0+	0	0	0	0	0
MIP-Home-Agent-Host	348	0	GROUPED	1	0	0	0	0-1	0	0-1	0	0	0	0	0
MIP6-Agent-Info	486	0	GROUPED	1	0	0	0	0-1	0	0-1	0	0	0	0	0
MIP6-Feature-Vector	124	0	UINT64	1	0	0	0	0	0	0-1	0-1	0	0	0	0
MIP6-Home-Link-Prefix	125	0	OCTETSTRING	1	0	0	0	0-1	0	0-1	0	0	0	0	0
Max-Requested-Bandwidth-DL	515	10415	UINT32	1	0	0	0	1	0	1	0	0	0	0	0
Max-Requested-Bandwidth-UL	516	10415	UINT32	1	0	0	0	1	0	1	0	0	0	0	0
Mobile-Node-Identifier	89	0	OCTETSTRING	1	0	0	0	0	0	0-1	0	0	0	0	0
Multi-Round-Time-Out	272	0	UINT32	0	0	0	0	0	0	0-1	0	0	0	0	0
Origin-Host	264	0	DIAMIDENT	1	0	1	1	1	1	1	1	1	1	1	1
Origin-Realm	296	0	DIAMIDENT	1	0	1	1	1	1	1	1	1	1	1	1
Origin-State-Id	278	0	UINT32	1	0	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1

Attribute	AVP Code	Vendor-Id	AVP Type	M Flag	P Flag	ASA	ASR	AAA	AAR	DEA	DER	RAA	RAR	STA	STR
PDN-GW-Allocation-Type	1438	10415	ENUM	1	0	0	0	0-1	0	0-1	0	0	0	0	0
PDN-Type	1456	10415	ENUM	1	0	0	0	1	0	1	0	0	0	0	0
Proxy-Host	280	0	DIAMIDENT	1	0	1	1	1	1	1	1	1	1	1	1
Proxy-Info	284	0	GROUPED	1	0	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+
Proxy-State	33	0	OCTETSTRING	1	0	1	1	1	1	1	1	1	1	1	1
QoS-Capability	6063	0	GROUPED	1	0	0	0	0	0-1	0	0-1	0	0	0	0
QoS-Class-Identifier	1028	10415	ENUM	1	0	0	0	1	0	1	0	0	0	0	0
QoS-Profile-Template	6067	0	UINT32	1	0	0	0	0	0+	0	0+	0	0	0	0
RAT-Type	1032	10415	ENUM	1	0	0	0	0	0-1	0	0-1	0	0	0	0
Re-Auth-Request-Type	285	0	ENUM	1	0	0	0	0	0	0	0	0	1	0	0
Redirect-Host	292	0	OCTETSTRING	1	0	0+	0	0+	0	0+	0	0+	0	0+	0
Redirect-Host-Usage	261	0	ENUM	1	0	0-1	0	0-1	0	0-1	0	0-1	0	0-1	0
Redirect-Max-Cache-Time	262	0	UINT32	1	0	0-1	0	0-1	0	0-1	0	0-1	0	0-1	0
Reply-Message	18	0	UTF8STRING	1	0	0	0+	0	0	0	0	0	0	0	0
Result-Code	268	0	ENUM	1	0	1	0	0-1	0	0-1	0	1	0	1	0
Route-Record	282	0	DIAMIDENT	1	0	0	0+	0	0+	0	0+	0	0+	0	0+
SGW-Address	1403	10415	ADDRESS	1	0	0	0	0	0	0-1	0	0	0	0	0
Served-Party-IP-Address	848	10415	ADDRESS	1	0	0	0	0-1	0	0-1	0	0	0	0	0
Service-Selection	493	0	OCTETSTRING	1	0	0	0	1	0	1	0-1	0	0	0	0
Session-Id	263	0	UTF8STRING	1	0	1	1	1	1	1	1	1	1	1	1
Session-Timeout	27	0	UINT32	1	0	0	0	0-1	0	0-1	0	0	0	0	0
Software-Version	1403	10415	UTF8STRING	1	0	0	0	0	0	0	0-1	0	0	0	0
State	24	0	OCTETSTRING	1	0	0-1	0-1	0-1	0	0-1	0-1	0-1	0-1	0-1	0
Supported-Features	628	10415	GROUPED	1	0	0	0	0	0	0+	0+	0	0	0	0
Terminal-Information	1401	10415	GROUPED	1	0	0	0	0	0	0	0-1	0	0	0	0
Termination-Cause	295	0	ENUM	1	0	0	0	0	0	0	0	0	0	0	1
User-Name	1	0	UTF8STRING	1	0	0	0-1	0	0-1	0-1	0-1	0	0-1	0	0-1
VPLMN-Dynamic-Address-Allowed	1432	10415	ENUM	1	0	0	0	0-1	0	0-1	0	0	0	0	0
Vendor-Id	266	0	UINT32	1	0	0	0	1	0	1	1	0	0	0	0
Vendor-Specific-QoS-Profile-Template	6064	0	GROUPED	1	0	0	0	0	0+	0	0+	0	0	0	0
Visited-Network-Identifier	600	10415	OCTETSTRING	1	0	0	0	0	0-1	0	0-1	0	0	0	0

## Standard Rel. 8 Gx Dictionary 3GPP 29.212

Attribute	AVP Code	Vendor-Id	AVP Type	M Flag	P Flag	CCA	CCR	RAA	RAR
3GPP2-BSID	9010	5535	OCTETSTRING	1	0	0	0-1	0	0-1
3GPP-MS-TimeZone	23	10415	OCTETSTRING	1	0	0	0-1	0-1	0-1
3GPP-SGSN-Address	6	10415	OCTETSTRING	1	0	0	0-1	0-1	0-1
3GPP-SGSN-IPv6-Address	15	10415	OCTETSTRING	1	0	0	0-1	0-1	0-1
3GPP-SGSN-MCC-MNC	18	10415	UTF8STRING	1	0	0	0-1	0-1	0
3GPP-User-Location-Info	22	10415	UTF8STRING	1	0	0	0-1	0-1	0-1
Access-Network-Charging-Address	501	10415	ADDRESS	1	0	0	0-1	0-1	0
Access-Network-Charging-Identifier-Gx	1022	10415	GROUPED	1	0	0	0+	0+	0
Allocation-Retention-Priority	1034	10415	GROUPED	1	0	0-1	0-1	0	0-1
AN-GW-Address	1050	10415	ADDRESS	1	0	0	0+	0-1	0
APN-Aggregate-Max-Bitrate-DL	1040	10415	UINT32	1	0	0-1	0-1	0	0-1
APN-Aggregate-Max-Bitrate-UL	1041	10415	UINT32	1	0	0-1	0-1	0	0-1
Auth-Application-Id	258	0	UINT32	1	0	1	1	0	1
Bearer-Control-Mode	1023	10415	ENUM	1	0	0-1	0	0	0
Bearer-Identifier	1020	10415	OCTETSTRING	1	0	0-1	0-1	0	0-1
Bearer-Operation	1021	10415	ENUM	1	0	0	0-1	0	0
Bearer-Usage	1000	10415	ENUM	1	0	0	0-1	0	0
Called-Station-Id	30	0	OCTETSTRING	1	0	0	0-1	0	0
CC-Request-Number	415	0	UINT32	1	0	1	1	0	0
CC-Request-Type	416	0	ENUM	1	0	1	1	0	0
Charging-Information	618	10415	GROUPED	1	0	0-1	0	0	0
Charging-Rule-Base-Name	1004	10415	UTF8STRING	1	0	0+	0	0	0+
Charging-Rule-Definition	1003	10415	GROUPED	1	0	0+	0	0	0+
Charging-Rule-Install	1001	10415	GROUPED	1	0	0+	0	0	0+
Charging-Rule-Name	1005	10415	OCTETSTRING	1	0	0+	0	0	0+
Charging-Rule-Remove	1002	10415	GROUPED	1	0	0+	0	0	0+
Charging-Rule-Report	1018	10415	GROUPED	1	0	0	0+	0+	0
CoA-Information	1039	10415	GROUPED	1	0	0	0+	0	0
Default-EPS-Bearer-QoS	1049	10415	GROUPED	1	0	0-1	0-1	0	0-1
Destination-Host	293	0	DIAMIDENT	1	0	0	0-1	0	1
Destination-Realm	283	0	DIAMIDENT	1	0	0	1	0	1
Error-Message	281	0	UTF8STRING	0	0	0-1	0	0-1	0
Error-Reporting-Host	294	0	DIAMIDENT	1	0	0-1	0	0-1	0
Event-Report-Indication	1033	10415	GROUPED	1	0	0	0-1	0	0-1
Event-Trigger	1006	10415	ENUM	1	0	0+	0+	0	0+
Experimental-Result	297	0	GROUPED	1	0	0-1	0	0-1	0

Attribute	AVP Code	Vendor-Id	AVP Type	M Flag	P Flag	CCA	CCR	RAA	RAR
Failed-AVP	279	0	GROUPED	1	0	0+	0	0+	0
Feature-List	630	10415	UINT32	0	0	1	1	1	1
Feature-List-ID	629	10415	UINT32	0	0	1	1	1	1
Flow-Label	1057	10415	OCTETSTRING	1	0	0	0-1	0	0
Framed-IP-Address	8	0	OCTETSTRING	1	0	0	0-1	0	0
Framed-IPv6-Prefix	97	0	OCTETSTRING	1	0	0	0-1	0	0
Granted-Service-Unit	431	0	GROUPED	0	0	0	0	0	0
Guaranteed-Bitrate-DL	1025	10415	UINT32	1	0	0-1	0-1	0	0-1
Guaranteed-Bitrate-UL	1026	10415	UINT32	1	0	0-1	0-1	0	0-1
IP-CAN-Type	1027	10415	ENUM	1	0	0	0-1	0-1	0
Max-Requested-Bandwidth-DL	515	10415	UINT32	1	0	0-1	0-1	0	0-1
Max-Requested-Bandwidth-UL	516	10415	UINT32	1	0	0-1	0-1	0	0-1
Network-Request-Support	1024	10415	ENUM	1	0	0	0-1	0	0
Offline	1008	10415	ENUM	1	0	0-1	0-1	0	0
Online	1009	10415	ENUM	1	0	0-1	0-1	0	0
Origin-Host	264	0	DIAMIDENT	1	0	1	1	1	1
Origin-Realm	296	0	DIAMIDENT	1	0	1	1	1	1
Origin-State-Id	278	0	UINT32	1	0	0-1	0-1	0-1	0-1
Packet-Filter-Content	1059	10415	IPFILTERRULE	1	0	0	0-1	0	0
Packet-Filter-Identifier	1060	10415	OCTETSTRING	1	0	0	0-1	0	0
Packet-Filter-Information	1061	10415	GROUPED	0	0	0	0+	0	0
Packet-Filter-Operation	1062	10415	ENUM	1	0	0	0-1	0	0
Precedence	1010	10415	UINT32	1	0	0	0-1	0-1	0
Proxy-Info	284	0	GROUPED	1	0	0+	0+	0+	0+
QoS-Class-Identifier	1028	10415	ENUM	1	0	0-1	0-1	0	0-1
QoS-Information	1016	10415	GROUPED	1	0	0+	0-1	0	0+
QoS-Negotiation	1029	10415	ENUM	1	0	0	0-1	0	0
QoS-Upgrade	1030	10415	ENUM	1	0	0	0-1	0	0
RAI	909	10415	UTF8STRING	1	0	0	0-1	0-1	0-1
RAT-Type	1032	10415	ENUM	1	0	0	0-1	0-1	0-1
Re-Auth-Request-Type	285	0	ENUM	1	0	0	0	0	1
Redirect-Host	292	0	OCTETSTRING	1	0	0+	0	0	0
Redirect-Host-Usage	261	0	ENUM	1	0	0-1	0	0	0
Redirect-Max-Cache-Time	262	0	UINT32	1	0	0-1	0	0	0
Resource-Allocation-Notification	1063	10415	ENUM	1	0	0-1	0	0	0-1
Result-Code	268	0	ENUM	1	0	0-1	0	0-1	0
Revalidation-Time	1042	10415	TIME	1	0	0-1	0	0	0-1
Route-Record	282	0	DIAMIDENT	1	0	0+	0+	0	0+
Rule-Activation-Time	1043	10415	TIME	1	0	0-1	0	0	0-1

Attribute	AVP Code	Vendor-Id	AVP Type	M Flag	P Flag	CCA	CCR	RAA	RAR
Rule-Deactivation-Time	1044	10415	TIME	1	0	0-1	0	0	0-1
Security-Parameter-Index	1056	10415	OCTETSTRING	1	0	0	0-1	0	0
Session-Id	263	0	UTF8STRING	1	0	1	1	1	1
Session-Release-Cause	1045	10415	ENUM	1	0	0	0	0	0-1
Subscription-Id	443	0	GROUPED	1	0	0	0+	0	0
Supported-Features	628	10415	GROUPED	0	0	0+	0+	0+	0+
Termination-Cause	295	0	ENUM	1	0	0	0-1	0	0
TFT-Filter	1012	10415	IPFILTERRULE	1	0	0	0	0-1	0
TFT-Packet-Filter-Information	1013	10415	GROUPED	1	0	0	0+	0	0
ToS-Traffic-Class	1014	10415	OCTETSTRING	1	0	0	0-1	0-1	0
Trace-Data	1458	10415	GROUPED	1	0	0	0-1	0	0-1
Trace-Reference	1459	10415	OCTETSTRING	1	0	0	0-1	0	0-1
Usage-Monitoring-Information	1067	10415	GROUPED	0	0	0+	0+	0	0+
Used-Service-Unit	446	0	GROUPED	0	0	0	0	0	0
User-Equipment-Info	458	0	GROUPED	1	0	0	0-1	0	0
Vendor-Id	266	0	UINT32	1	0	1	1	1	1

## Standard Gxa Dictionary 3GPP 29.212

Attribute	AVP Code	Vendor-Id	AVP Type	M Flag	P Flag	CCA	CCR	RAA	RAR
3GPP2-BSID	9010	5535	OCTETSTRING	1	0	0	0-1	0-1	0
3GPP-MS-TimeZone	23	10415	OCTETSTRING	1	0	0	0	0-1	0
3GPP-SGSN-Address	6	10415	OCTETSTRING	1	0	0	0	0-1	0
3GPP-SGSN-IPv6-Address	15	10415	OCTETSTRING	1	0	0	0	0-1	0
3GPP-SGSN-MCC-MNC	18	10415	UTF8STRING	1	0	0	0-1	0-1	0
3GPP-User-Location-Info	22	10415	UTF8STRING	1	0	0	0	0-1	0
Allocation-Retention-Priority	1034	10415	GROUPED	1	0	0-1	0-1	0	0-1
APN-Aggregate-Max-Bitrate-DL	1040	10415	UINT32	1	0	0-1	0-1	0	0-1
APN-Aggregate-Max-Bitrate-UL	1041	10415	UINT32	1	0	0-1	0-1	0	0-1
Auth-Application-Id	258	0	UINT32	1	0	1	1	0	1
Bearer-Control-Mode	1023	10415	ENUM	1	0	0-1	0	0	0
Called-Station-Id	30	0	OCTETSTRING	1	0	0	0-1	0	0
CC-Request-Number	415	0	UINT32	1	0	1	1	0	0
CC-Request-Type	416	0	ENUM	1	0	1	1	0	0
Default-EPS-Bearer-QoS	1049	10415	GROUPED	1	0	0-1	0-1	0	0-1
Destination-Host	293	0	DIAMIDENT	1	0	0	0-1	0	1
Destination-Realm	283	0	DIAMIDENT	1	0	0	1	0	1
Error-Message	281	0	UTF8STRING	0	0	0-1	0	0-1	0
Error-Reporting-Host	294	0	DIAMIDENT	1	0	0-1	0	0-1	0
Event-Trigger	1006	10415	ENUM	1	0	0+	0+	0	0+
Experimental-Result	297	0	GROUPED	1	0	0-1	0	0-1	0
Failed-AVP	279	0	GROUPED	1	0	0+	0	0+	0
Feature-List	630	10415	UINT32	0	0	1	1	1	1
Feature-List-ID	629	10415	UINT32	0	0	1	1	1	1
Framed-IP-Address	8	0	OCTETSTRING	1	0	0	0-1	0	0
Framed-IPv6-Prefix	97	0	OCTETSTRING	1	0	0	0-1	0	0
Guaranteed-Bitrate-DL	1025	10415	UINT32	1	0	0-1	0-1	0	0-1
Guaranteed-Bitrate-UL	1026	10415	UINT32	1	0	0-1	0-1	0	0-1
IP-CAN-Type	1027	10415	ENUM	1	0	0	0-1	0	0
Max-Requested-Bandwidth-DL	515	10415	UINT32	1	0	0-1	0-1	0	0-1
Max-Requested-Bandwidth-UL	516	10415	UINT32	1	0	0-1	0-1	0	0-1
Network-Request-Support	1024	10415	ENUM	1	0	0	0-1	0	0
Origin-Host	264	0	DIAMIDENT	1	0	1	1	1	1
Origin-Realm	296	0	DIAMIDENT	1	0	1	1	1	1
Origin-State-Id	278	0	UINT32	1	0	0-1	0-1	0-1	0-1
Precedence	1010	10415	UINT32	1	0	0-1	0-1	0	0-1

Attribute	AVP Code	Vendor-Id	AVP Type	M Flag	P Flag	CCA	CCR	RAA	RAR
Proxy-Info	284	0	GROUPED	1	0	0+	0+	0+	0+
QoS-Class-Identifier	1028	10415	ENUM	1	0	0-1	0-1	0	0-1
QoS-Information	1016	10415	GROUPED	1	0	0+	0-1	0	0+
QoS-Rule-Install	1051	10415	GROUPED	1	0	0+	0	0	0+
QoS-Rule-Remove	1052	10415	GROUPED	1	0	0+	0	0	0+
QoS-Rule-Report	1055	10415	GROUPED	1	0	0	0+	0+	0
RAI	909	10415	UTF8STRING	1	0	0	0	0-1	0
RAT-Type	1032	10415	ENUM	1	0	0	0-1	0-1	0
Re-Auth-Request-Type	285	0	ENUM	1	0	0	0	0	1
Redirect-Host	292	0	OCTETSTRING	1	0	0+	0	0	0
Redirect-Host-Usage	261	0	ENUM	1	0	0-1	0	0	0
Redirect-Max-Cache-Time	262	0	UINT32	1	0	0-1	0	0	0
Result-Code	268	0	ENUM	1	0	0-1	0	0-1	0
Route-Record	282	0	DIAMIDENT	1	0	0+	0+	0	0+
Session-Id	263	0	UTF8STRING	1	0	1	1	1	1
Session-Linking-Indicator	1064	10415	ENUM	1	0	0	0-1	0	0
Session-Release-Cause	1045	10415	ENUM	1	0	0	0	0	0-1
Subscription-Id	443	0	GROUPED	1	0	0	0+	0	0
Supported-Features	628	10415	GROUPED	0	0	0+	0+	0+	0+
TFT-Filter	1012	10415	IPFILTERRULE	1	0	0-1	0-1	0	0-1
TFT-Packet-Filter-Information	1013	10415	GROUPED	1	0	0	0+	0	0
ToS-Traffic-Class	1014	10415	OCTETSTRING	1	0	0-1	0-1	0	0-1
User-Equipment-Info	458	0	GROUPED	1	0	0	0-1	0	0
Vendor-Id	266	0	UINT32	1	0	1	1	1	1

## Standard Gxc Dictionary 3GPP 29.212

Attribute	AVP Code	Vendor-Id	AVP Type	M Flag	P Flag	CCA	CCR	RAA	RAR
3GPP2-BSID	9010	5535	OCTETSTRING	1	0	0	0-1	0-1	0
3GPP-MS-TimeZone	23	10415	OCTETSTRING	1	0	0	0-1	0-1	0
3GPP-SGSN-Address	6	10415	OCTETSTRING	1	0	0	0-1	0-1	0
3GPP-SGSN-IPv6-Address	15	10415	OCTETSTRING	1	0	0	0-1	0-1	0
3GPP-SGSN-MCC-MNC	18	10415	UTF8STRING	1	0	0	0-1	0-1	0
3GPP-User-Location-Info	22	10415	UTF8STRING	1	0	0	0	0-1	0
Access-Network-Charging-Address	501	10415	ADDRESS	1	0	0	0-1	0-1	0
Access-Network-Charging-Identifier-Gx	1022	10415	GROUPED	1	0	0	0+	0+	0
AN-GW-Address	1050	10415	ADDRESS	1	0	0	0-1	0	0
Auth-Application-Id	258	0	UINT32	1	0	1	1	0	1
Called-Station-Id	30	0	OCTETSTRING	1	0	0	0-1	0	0
CC-Request-Number	415	0	UINT32	1	0	1	1	0	0
CC-Request-Type	416	0	ENUM	1	0	1	1	0	0
Charging-Information	618	10415	GROUPED	1	0	0-1	0	0	0
Default-EPS-Bearer-QoS	1049	10415	GROUPED	1	0	0-1	0-1	0	0-1
Destination-Host	293	0	DIAMIDENT	1	0	0	0-1	0	1
Destination-Realm	283	0	DIAMIDENT	1	0	0	1	0	1
Error-Message	281	0	UTF8STRING	0	0	0-1	0	0-1	0
Error-Reporting-Host	294	0	DIAMIDENT	1	0	0-1	0	0-1	0
Event-Trigger	1006	10415	ENUM	1	0	0+	0+	0	0+
Experimental-Result	297	0	GROUPED	1	0	0-1	0	0-1	0
Failed-AVP	279	0	GROUPED	1	0	0+	0	0+	0
Framed-IP-Address	8	0	OCTETSTRING	1	0	0	0-1	0	0
Framed-IPv6-Prefix	97	0	OCTETSTRING	1	0	0	0-1	0	0
IP-CAN-Type	1027	10415	ENUM	1	0	0	0-1	0	0
Origin-Host	264	0	DIAMIDENT	1	0	1	1	1	1
Origin-Realm	296	0	DIAMIDENT	1	0	1	1	1	1
Origin-State-Id	278	0	UINT32	1	0	0-1	0-1	0-1	0-1
Proxy-Info	284	0	GROUPED	1	0	0+	0+	0+	0+
QoS-Information	1016	10415	GROUPED	1	0	0+	0-1	0	0+
QoS-Resource-Request	6106	10415	GROUPED	1	0	0	0-1	0	0
QoS-Rule-Install	1051	10415	GROUPED	1	0	0+	0	0	0+
QoS-Rule-Remove	1052	10415	GROUPED	1	0	0+	0	0	0+
QoS-Rule-Report	1055	10415	GROUPED	1	0	0	0+	0+	0
RAI	909	10415	UTF8STRING	1	0	0	0	0-1	0
RAT-Type	1032	10415	ENUM	1	0	0	0-1	0-1	0

Attribute	AVP Code	Vendor-Id	AVP Type	M Flag	P Flag	CCA	CCR	RAA	RAR
Re-Auth-Request-Type	285	0	ENUM	1	0	0	0	0	1
Redirect-Host	292	0	OCTETSTRING	1	0	0+	0	0	0
Redirect-Host-Usage	261	0	ENUM	1	0	0-1	0	0	0
Redirect-Max-Cache-Time	262	0	UINT32	1	0	0-1	0	0	0
Result-Code	268	0	ENUM	1	0	0-1	0	0-1	0
Route-Record	282	0	DIAMIDENT	1	0	0+	0+	0	0+
Session-Id	263	0	UTF8STRING	1	0	1	1	1	1
Session-Linking-Indicator	1064	10415	ENUM	1	0	0	0-1	0	0
Session-Release-Cause	1045	10415	ENUM	1	0	0	0	0	0-1
Subscription-Id	443	0	GROUPED	1	0	0	0+	0	0
Supported-Features	628	10415	GROUPED	1	0	0+	0+	0+	0+
Termination-Cause	295	0	ENUM	1	0	0	0-1	0	0
TFT-Packet-Filter-Information	1013	10415	GROUPED	1	0	0	0+	0	0
User-Equipment-Info	458	0	GROUPED	1	0	0	0-1	0	0

## Standard Rf Dictionary

Attribute	AVP Code	Vendor-Id	AVP Type	M Flag	P Flag	AA	AR
3GPP2-BSID	9010	5535	OCTETSTRING	1	0	0	0-1
3GPP-Charging-Characteristics	13	10415	UTF8STRING	1	0	0	0-1
3GPP-Charging-Id	2	10415	OCTETSTRING	1	0	0	0-1
3GPP-GGSN-MCC-MNC	9	10415	UTF8STRING	1	0	0	0-1
3GPP-IMSI-MCC-MNC	8	10415	UTF8STRING	1	0	0	0-1
3GPP-MS-TimeZone	23	10415	OCTETSTRING	1	0	0	0-1
3GPP-PDP-Type	3	10415	ENUM	1	0	0	0-1
3GPP-RAT-Type	21	10415	OCTETSTRING	1	0	0	0-1
3GPP-Selection-Mode	12	10415	UTF8STRING	1	0	0	0-1
3GPP-SGSN-MCC-MNC	18	10415	UTF8STRING	1	0	0	0-1
3GPP-User-Location-Info	22	10415	OCTETSTRING	1	0	0	0-1
Accounting-Record-Number	485	0	UINT32	1	0	1	1
Accounting-Record-Type	480	0	ENUM	1	0	1	1
Acct-Application-Id	259	0	UINT32	1	0	0-1	0-1
Acct-Interim-Interval	85	0	UINT32	1	0	0-1	0-1
AF-Correlation-Information	1276	10415	GROUPED	1	0	0	0
Called-Station-Id	30	10415	UTF8STRING	1	0	0	0-1
Change-Condition	2037	10415	ENUM	1	0	0	0-1
Destination-Host	293	0	DIAMIDENT	1	0	0	0-1
Destination-Realm	283	0	DIAMIDENT	1	0	0	1
Diagnostics	2039	10415	ENUM	1	0	0	0-1
Dynamic-Address-Flag	2051	10415	ENUM	1	0	0	0-1
Error-Reporting-Host	294	0	DIAMIDENT	1	0	0-1	0
Event-Timestamp	55	0	TIME	1	0	0-1	0-1
GGSN-Address	847	10415	ADDRESS	1	0	0	0-1
IMS-Information	876	10415	GROUPED	1	0	0	0-1
Node-Functionality	862	10415	ENUM	1	0	0	1
Node-Id	2064	10415	UTF8STRING	1	0	0	0-1
Origin-Host	264	0	DIAMIDENT	1	0	1	1
Origin-Realm	296	0	DIAMIDENT	1	0	1	1
Origin-State-Id	278	0	UINT32	1	0	0-1	0-1
PDP-Address	1227	10415	ADDRESS	1	0	0	0+
Proxy-Info	284	0	GROUPED	1	0	0+	0+
PS-Information	874	10415	GROUPED	1	0	0	0-1
Result-Code	268	0	ENUM	1	0	1	0
Route-Record	282	0	DIAMIDENT	1	0	0+	0+

Attribute	AVP Code	Vendor-Id	AVP Type	M Flag	P Flag	AA	AR
Service-Context-Id	461	0	UTF8STRING	1	0	0	0-1
Service-Data-Container	2040	10415	GROUPED	1	0	0	0+
Service-Information	873	10415	GROUPED	1	0	0	0-1
Service-Specific-Info	1249	10415	GROUPED	1	0	0	0
Serving-Node-Type	2047	10415	ENUM	1	0	0	0-1
Session-Id	263	0	UTF8STRING	1	0	1	1
SGSN-Address	1228	10415	ADDRESS	1	0	0	0-1
SGW-Change	2065	10415	ENUM	1	0	0	0-1
Start-Time	2041	10415	TIME	1	0	0	0-1
Stop-Time	2042	10415	TIME	1	0	0	0-1
Subscription-Id	443	0	GROUPED	1	0	0	0+
Traffic-Data-Volumes	2046	10415	GROUPED	1	0	0	0+
User-Equipment-Info	458	0	GROUPED	1	0	0	0-1
User-Name	1	0	UTF8STRING	1	0	0-1	0-1

## Standard ETSI-E2 Dictionary for CSCF

Attribute	AVP Code	Vendor-Id	AVP Type	M Flag	P Flag	UDA	UDR
Access-Network-Type	306	0	GROUPED	1	0	0-1	0
AF-Application-Identifier	504	10415	OCTETSTRING	1	0	0	0-1
Auth-Session-State	277	0	ENUM	1	0	1	1
Destination-Host	293	0	DIAMIDENT	1	0	0	0-1
Destination-Realm	283	0	DIAMIDENT	1	0	0	1
Experimental-Result	297	0	GROUPED	1	0	0-1	0
Failed-AVP	279	0	GROUPED	1	0	0+	0
Globally-Unique-Address	300	13019	GROUPED	1	0	0	0-1
Location-Information	350	13019	GROUPED	1	0	0-1	0
Logical-Access-Id	302	0	OCTETSTRING	1	0	0-1	0
Origin-Host	264	0	DIAMIDENT	1	0	1	1
Origin-Realm	296	0	DIAMIDENT	1	0	1	1
Physical-Access-Id	313	0	UTF8STRING	1	0	0-1	0
Proxy-Info	284	0	GROUPED	1	0	0+	0+
RACS-Contact-Point	351	0	DIAMIDENT	1	0	0-1	0
Requested-Information	353	13019	ENUM	1	0	0	0-1
Result-Code	268	0	ENUM	1	0	0-1	0
Route-Record	282	0	DIAMIDENT	1	0	0+	0+
Session-Id	263	0	UTF8STRING	1	0	1	1
Terminal-Type	352	13019	OCTETSTRING	1	0	0-1	0
User-Name	1	0	UTF8STRING	1	0	0-1	0-1
Vendor-Specific-Application-Id	260	0	GROUPED	1	0	1	1

## Standard STa Dictionary 3GPP 29.273

Attribute	AVP Code	Vendor-Id	AVP Type	M Flag	P Flag	ASA	ASR	AAA	AAR	DEA	DER	RAA	RAR	STA	STR
3GPP-Charging-Characteristics	13	10415	UTF8STRING	1	0	0	0	0-1	0	0-1	0	0	0	0	0
Acct-Interim-Interval	85	0	UINT32	0	0	0	0	0-1	0	0-1	0	0	0	0	0
Allocation-Retention-Priority	1034	10415	GROUPED	1	0	0	0	1	0	1	0	0	0	0	0
AMBR	1435	10415	GROUPED	1	0	0	0	0-1	0	0-1	0	0	0	0	0
ANID	1504	10415	UTF8STRING	1	0	0	0	0	0	0	0-1	0	0	0	0
AN-Trusted	1503	10415	ENUM	1	0	0	0	0	0	0	0-1	0	0	0	0
APN-Configuration	1430	10415	GROUPED	1	0	0	0	0+	0	0+	0	0	0	0	0
APN-OI-Replacement	1427	10415	UTF8STRING	1	0	0	0	0-1	0	0-1	0	0	0	0	0
Auth-Application-Id	258	0	UINT32	1	0	0	1	1	1	1	1	0	1	0	1
Auth-Grace-Period	276	0	UINT32	1	0	0	0	0-1	0-1	0-1	0-1	0	0	0	0
Authorization-Lifetime	291	0	UINT32	1	0	0	0	0-1	0-1	0-1	0-1	0	0	0	0
Auth-Request-Type	274	0	ENUM	1	0	0	0	1	1	1	1	0	0	0	0
Auth-Session-State	277	0	ENUM	1	0	0	0	0-1	0-1	0-1	0-1	0	0	0	0
Calling-Station-Id	31	0	UTF8STRING	1	0	0	0	0	0	0	0-1	0	0	0	0
Class	25	0	OCTETSTRING	1	0	0	0+	0+	0	0+	0	0+	0+	0+	0+
Context-Identifier	1423	10415	UINT32	1	0	0	0	0-1	0	0-1	0	0	0	0	0
Destination-Host	293	0	DIAMIDENT	1	0	0	1	1	0-1	1	0-1	0	1	0	0-1
Destination-Realm	283	0	DIAMIDENT	1	0	0	1	1	1	1	1	0	1	0	1
EAP-Master-Session-Key	464	0	OCTETSTRING	1	0	0	0	0	0	0-1	0	0	0	0	0
EAP-Payload	462	0	OCTETSTRING	1	0	0	0	0	0	0	1	1	0	0	0
EPS-Subscribed-QoS-Profile	1431	10415	GROUPED	1	0	0	0	0-1	0	0-1	0	0	0	0	0
Error-Message	281	0	UTF8STRING	0	0	0-1	0	0-1	0	0-1	0	0-1	0	0-1	0
Error-Reporting-Host	294	0	DIAMIDENT	1	0	0-1	0	0-1	0	0-1	0	0-1	0	0-1	0
ESN	6109	10415	OCTETSTRING	1	0	0	0	0	0	0	0-1	0	0	0	0
Experimental-Result	297	0	GROUPED	1	0	0	0	0-1	0	0-1	0	0	0	0	0
Experimental-Result-Code	298	0	ENUM	1	0	0	0	1	0	1	0	0	0	0	0
Failed-AVP	279	0	GROUPED	1	0	0+	0	0+	0	0+	0	0+	0	0+	0
Feature-List	630	10415	UINT32	0	0	0	0	0	0	1	1	0	0	0	0
Feature-List-ID	629	10415	UINT32	0	0	0	0	0	0	1	1	0	0	0	0
Idle-Timeout	28	0	UINT32	1	0	0	0	0-1	0	0-1	0	0	0	0	0
IMEI	1402	10415	UTF8STRING	1	0	0	0	0	0	0	0-1	0	0	0	0
IP-MMS	6076	10415	UINT32	1	0	0	0	0	0	0-1	0	0	0	0	0
Max-Requested-Bandwidth-DL	515	10415	UINT32	1	0	0	0	1	0	1	0	0	0	0	0
Max-Requested-Bandwidth-UL	516	10415	UINT32	1	0	0	0	1	0	1	0	0	0	0	0
MEID	6110	10415	OCTETSTRING	1	0	0	0	0	0	0	0-1	0	0	0	0
MIP6-Agent-Info	486	0	GROUPED	1	0	0	0	0-1	0	0-1	0	0	0	0	0
MIP6-Feature-Vector	124	0	UINT64	1	0	0	0	0	0	0-1	0	0	0	0	0
MIP6-Home-Link-Prefix	125	0	OCTETSTRING	1	0	0	0	0-1	0	0-1	0	0	0	0	0
MIP-Home-Agent-Address-IETF	334	0	ADDRESS	1	0	0	0	0+	0	0+	0	0	0	0	0
MIP-Home-Agent-Host	348	0	GROUPED	1	0	0	0	0-1	0	0-1	0	0	0	0	0
Mobile-Node-Identifier	89	0	OCTETSTRING	1	0	0	0	0	0	0-1	0	0	0	0	0
Multi-Round-Time-Out	272	0	UINT32	0	0	0	0	0	0	0-1	0	0	0	0	0
Origin-Host	264	0	DIAMIDENT	1	0	1	1	1	1	1	1	1	1	1	1
Origin-Realm	296	0	DIAMIDENT	1	0	1	1	1	1	1	1	1	1	1	1
Origin-State-Id	278	0	UINT32	1	0	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1

Attribute	AVP Code	Vendor-Id	AVP Type	M Flag	P Flag	ASA	ASR	AAA	AAR	DEA	DER	RAA	RAR	STA	STR
PDN-GW-Allocation-Type	1438	10415	ENUM	1	0	0	0	0-1	0	0-1	0	0	0	0	0
PDN-Type	1456	10415	ENUM	1	0	0	0	1	0	1	0	0	0	0	0
Proxy-Host	280	0	DIAMIDENT	1	0	1	1	1	1	1	1	1	1	1	1
Proxy-Info	284	0	GROUPED	1	0	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+
Proxy-State	33	0	OCTETSTRING	1	0	1	1	1	1	1	1	1	1	1	1
QoS-Capability	6063	0	GROUPED	1	0	0	0	0	0-1	0	0-1	0	0	0	0
QoS-Class-Identifier	1028	10415	ENUM	1	0	0	0	1	0	1	0	0	0	0	0
QoS-Profile-Template	6067	0	UINT32	1	0	0	0	0	0+	0	0+	0	0	0	0
RAT-Type	1032	10415	ENUM	1	0	0	0	0	0-1	0	0-1	0	0	0	0
Re-Auth-Request-Type	285	0	ENUM	1	0	0	0	0	0	0	0	0	1	0	0
Redirect-Host	292	0	OCTETSTRING	1	0	0+	0	0+	0	0+	0	0+	0	0+	0
Redirect-Host-Usage	261	0	ENUM	1	0	0-1	0	0-1	0	0-1	0	0-1	0	0-1	0
Redirect-Max-Cache-Time	262	0	UINT32	1	0	0-1	0	0-1	0	0-1	0	0-1	0	0-1	0
Reply-Message	18	0	UTF8STRING	1	0	0	0+	0	0	0	0	0	0	0	0
Result-Code	268	0	ENUM	1	0	1	0	0-1	0	0-1	0	1	0	1	0
Route-Record	282	0	DIAMIDENT	1	0	0	0+	0	0+	0	0+	0	0+	0	0+
Served-Party-IP-Address	848	10415	ADDRESS	1	0	0	0	0-1	0	0-1	0	0	0	0	0
Service-Selection	493	0	OCTETSTRING	1	0	0	0	1	0	1	0-1	0	0	0	0
Session-Id	263	0	UTF8STRING	1	0	1	1	1	1	1	1	1	1	1	1
Session-Timeout	27	0	UINT32	1	0	0	0	0-1	0	0-1	0	0	0	0	0
SGW-Address	1403	10415	ADDRESS	1	0	0	0	0	0	0-1	0	0	0	0	0
Software-Version	1403	10415	UTF8STRING	1	0	0	0	0	0	0	0-1	0	0	0	0
State	24	0	OCTETSTRING	1	0	0-1	0-1	0-1	0	0-1	0-1	0-1	0-1	0-1	0
Supported-Features	628	10415	GROUPED	1	0	0	0	0	0	0+	0+	0	0	0	0
Terminal-Information	1401	10415	GROUPED	1	0	0	0	0	0	0	0-1	0	0	0	0
Termination-Cause	295	0	ENUM	1	0	0	0	0	0	0	0	0	0	0	1
User-Name	1	0	UTF8STRING	1	0	0	0-1	0	0-1	0-1	0-1	0	0-1	0	0-1
Vendor-Id	266	0	UINT32	1	0	0	0	1	0	1	0	0	0	0	0
Vendor-Specific-QoS-Profile-Template	6064	0	GROUPED	1	0	0	0	0	0+	0	0+	0	0	0	0
Visited-Network-Identifier	600	10415	OCTETSTRING	1	0	0	0	0	0-1	0	0-1	0	0	0	0
VPLMN-Dynamic-Address-Allowed	1432	10415	ENUM	1	0	0	0	0-1	0	0-1	0	0	0	0	0

# Appendix E

## RADIUS Attribute Quick Reference Tables

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This appendix presents RADIUS attribute quick reference tables listing RADIUS attributes and their relationships to generated RADIUS packets and the dictionaries to which they belong.

The following table describes the indicators used in the quick reference table.

Entry	Description
0	The AVP MUST NOT be present in the message.
0-1	Zero or one instance of the AVP MAY be present in the message. If there are more than one instance of the AVP, it is considered an error.
0+	Zero or more instances of the AVP MAY be present in the message.
1	One instance of the AVP MUST be present in the message.

Attributes not listed in a particular table do not appear in RADIUS packets generated for a session of the corresponding service.

## Management Attribute/Packet Table

Attribute	MGMT Access-Request	MGMT Access-Reject	MGMT Access-Accept	MGMT Acct-Request-Start	MGMT Acct-Request-Interim	MGMT Acct-Request-Stop
3GPP2-DNS-Server-IPV6-Addr	0	0	0-1	0	0	0
3GPP2-ESN	1	0	0	0	0	0
Acct-Authentic	0	0	0	1	1	1
Acct-Interim-Interval	0	0	0-1	0	0	0
Acct-Session-Id	0	0	0	1	1	1
Callback-Id	0	0-1	0-1	0	0	0
Class	0	0	0-1	0-1	0-1	0-1
EAP-Message	0+	1	0+	0	0	0
Error-Cause	0	0-1	0	0	0	0
Framed-IPv6-Prefix	0	0	0	0	0+	0+
Idle-Timeout	0	0	0-1	0	0	0
NAS-Port	1	0	0	1	1	1
NAS-Port-Type	1	0	0	1	1	1
Reply-Message	0	0-1	0-1	0	0	0
Service-Type	1	0	0-1	1	1	1
Session-Timeout	0	0	0-1	0	0	0
SN1-Admin-Expiry	0	0	0-1	0	0	0
SN1-Admin-Permission	0	0	0-1	0	0	0
SN1-DHCP-Lease-Expiry-Policy	0	0	0-1	0	0	0
SN1-Disconnect-Reason	0	0	0	0	0	1
SN1-DNS-Proxy-Intercept-List	0	0	1	0	0	0
SN1-DNS-Proxy-Use-Subscr-Addr	0	0	1	0	0	0
SN1-Enable-QoS-Renegotiation	0	0	0-1	0	0	0
SN1-Long-Duration-Action	0	0	0-1	0	0	0
SN1-Long-Duration-Notification	0	0	0-1	0	0	0
SN1-Long-Duration-Timeout	0	0	0-1	0	0	0
SN1-MIP-HA-Assignment-Table	0	0	1	0	0	0
SN1-Overload-Disc-Connect-Time	0	0	0-1	0	0	0
SN1-Overload-Disc-Inact-Time	0	0	0-1	0	0	0
SN1-Overload-Disconnect	0	0	0-1	0	0	0
SN1-QoS-Renegotiation-Timeout	0	0	0-1	0	0	0
SN1-Rulebase	0	0	0-1	1	1	1
SN1-Subscriber-Accounting	0	0	0-1	1	1	1
SN1-Subscriber-Acct-Interim	0	0	0-1	0	0	0
SN1-Subscriber-Acct-Mode	0	0	0-1	0	0	0
SN1-Subscriber-Acct-Rsp-Action	0	0	0-1	0	0	0
SN1-Subscriber-Acct-Start	0	0	0-1	0	0	0
SN1-Subscriber-Acct-Stop	0	0	0-1	0	0	0
SN1-Subscriber-Class	0	0	0-1	0-1	0-1	0-1
SN1-Subscriber-Nexthop-Address	0	0	0-1	1	1	1
SN1-Subscriber-No-Interims	0	0	0-1	0	0	0
SN1-Subscriber-Permission	0	0	0-1	0	0	0
SN-Acs-Credit-Control-Group	0	0	0-1	0-1	0-1	0-1
SN-Admin-Expiry	0	0	0-1	0	0	0

Attribute	MGMT Access-Request	MGMT Access-Reject	MGMT Access-Accept	MGMT Acct-Request-Start	MGMT Acct-Request-Interim	MGMT Acct-Request-Stop
SN-Admin-Permission	0	0	0-1	0	0	0
SN-DHCP-Lease-Expiry-Policy	0	0	0-1	0	0	0
SN-Disconnect-Reason	0	0	0	0	0	1
SN-DNS-Proxy-Intercept-List	0	0	1	0	0	0
SN-DNS-Proxy-Use-Subscr-Addr	0	0	1	0	0	0
SN-Enable-QoS-Renegotiation	0	0	0-1	0	0	0
SN-Fast-Reauth-Username	0	0	0-1	0	0	0
SN-Long-Duration-Action	0	0	0-1	0	0	0
SN-Long-Duration-Notification	0	0	0-1	0	0	0
SN-Long-Duration-Timeout	0	0	0-1	0	0	0
SN-MIP-HA-Assignment-Table	0	0	1	0	0	0
SN-Overload-Disc-Connect-Time	0	0	0-1	0	0	0
SN-Overload-Disc-Inact-Time	0	0	0-1	0	0	0
SN-Overload-Disconnect	0	0	0-1	0	0	0
SN-Pseudonym-Username	0	0	0-1	0	0	0
SN-QoS-Renegotiation-Timeout	0	0	0-1	0	0	0
SN-Rulebase	0	0	0-1	1	1	1
SN-Subscriber-Accounting	0	0	0-1	1	1	1
SN-Subscriber-Acct-Interim	0	0	0-1	0	0	0
SN-Subscriber-Acct-Mode	0	0	0-1	0	0	0
SN-Subscriber-Acct-Rsp-Action	0	0	0-1	0	0	0
SN-Subscriber-Acct-Start	0	0	0-1	0	0	0
SN-Subscriber-Acct-Stop	0	0	0-1	0	0	0
SN-Subscriber-Class	0	0	0-1	0-1	0-1	0-1
SN-Subscriber-Nexthop-Address	0	0	0-1	1	1	1
SN-Subscriber-No-Interims	0	0	0-1	0	0	0
SN-Subscriber-Permission	0	0	0-1	0	0	0
State	1	0	0-1	0	0	0
User-Name	1	0	0-1	1	1	1
User-Password	1	0	0	0	0	0
WiMAX-Home-HNP-PMIP6	0	0	0	0	0+	0+

## PSDN or FA Attribute/Packet Table

Attribute	PDSN or FA Access-Request	PDSN or FA Access-Reject	PDSN or FA Access-Accept	PDSN or FA Acct-Request-Start	PDSN or FA Acct-Request-Interim	PDSN or FA Acct-Request-Stop
3GPP2-Active-Time	0	0	0	1	1	1
3GPP2-Airlink-Record-Type	0	0	0	1	1	1
3GPP2-Airlink-Sequence-Number	0	0	0	1	1	1
3GPP2-Air-QOS	0	0	0	1	1	1
3GPP2-Allowed-Persistent-TFTs	0	0-1	0-1	0	0	0
3GPP2-Always-On	0	0	0-1	0-1	0-1	0-1
3GPP2-Bad-PPP-Frame-Count	0	0	0	1	1	1
3GPP2-BCMCS-Flow-ID	0-1	0	0	1	1	1
3GPP2-BCMCS-Flow-Transmit-Time	0	0	0	1	1	1
3GPP2-BCMCS-Mcast-IP-Addr	0	0	0-1	1	0	1
3GPP2-BCMCS-Mcast-Port	0	0	0-1	1	0	1
3GPP2-BCMCS-Reason-Code	1	0	0	0	0	0
3GPP2-Beginning-Session	0	0	0	1	0	0
3GPP2-BSID	1	0	0	1	1	1
3GPP2-Comp-Tunnel-Indicator	0	0	0	1	1	1
3GPP2-Correlation-Id	1	0	0	1	1	1
3GPP2-DCCCH-Frame-Size	0	0	0	1	1	1
3GPP2-DNS-Server-IPV6-Addr	0	0	0-1	0	0	0
3GPP2-ESN	1	0	0	1	1	1
3GPP2-FA-Address	0-1	0	0	0-1	0-1	0-1
3GPP2-FEID	0	0	0	1	1	1
3GPP2-Flow-Status	0	0	0	0	0	0-1
3GPP2-Forward-Fundamental-Rate	0	0	0	1	1	1
3GPP2-Forward-Fundamental-RC	0	0	0	1	1	1
3GPP2-Forward-Mux-Option	0	0	0	1	1	1
3GPP2-Forward-Traffic-Type	0	0	0	1	1	1
3GPP2-Fundamental-Frame-Size	0	0	0	1	1	1
3GPP2-Fwd-Dcch-Mux-Option	0	0	0	0-1	0-1	0-1
3GPP2-Fwd-Dcch-Rc	0	0	0	0-1	0-1	0-1
3GPP2-Fwd-Pdch-Rc	0	0	0	0-1	0-1	0-1
3GPP2-IKE-Secret	0	0	0-1	0	0	0
3GPP2-IKE-Secret-Request	0-1	0	0	0	0	0
3GPP2-Inter-User-Priority	0	0-1	0-1	0	0	0
3GPP2-IP-QOS	0	0	0-1	1	1	1
3GPP2-IP-Services-Authorized	0	0-1	0-1	0	0	0
3GPP2-IP-Technology	0-1	0	0-1	1	1	1
3GPP2-KeyID	0	0	0-1	0	0	0
3GPP2-Last-Activity	0	0	0	0	0-1	1
3GPP2-Max-Auth-Aggr-Bw-BET	0	0-1	0-1	0	0	0
3GPP2-Max-Per-Fi-Pri-ForTheUser	0	0-1	0-1	0	0	0
3GPP2-MEID	1	0	0	1	1	1
3GPP2-MIP6-Home-Address	0	0	0-1	0	0	0
3GPP2-MIP6-Home-Agent	0	0	0-1	0	0	0

Attribute	PDSN or FA Access-Request	PDSN or FA Access-Reject	PDSN or FA Access-Accept	PDSN or FA Acct-Request-Start	PDSN or FA Acct-Request-Interim	PDSN or FA Acct-Request-Stop
3GPP2-MIP6-Home-Link-Prefix	0	0	0-1	0	0	0
3GPP2-MIP-HA-Address	1	0	0+	1	1	1
3GPP2-MIP-Rev-Tunnel-Required	0	0	0-1	0	0	0
3GPP2-MIP-Sig-Octet-Count-In	0	0	0	1	1	1
3GPP2-MIP-Sig-Octet-Count-Out	0	0	0	1	1	1
3GPP2-MN-AAA-Removal-Indication	0	0	0-1	0	0	0
3GPP2-MN-HA-SPI	0-1	0	0	0	0	0
3GPP2-Mobile-Term-Orig-Ind	0	0	0	1	1	1
3GPP2-Number-Active-Transitions	0	0	0	1	1	1
3GPP2-Num-Bytes-Received-Total	0	0	0	1	1	1
3GPP2-Num-SDB-Input	0	0	0	1	1	1
3GPP2-Num-SDB-Output	0	0	0	1	1	1
3GPP2-PMIP-Capability	0-1	0	0	0-1	0-1	0-1
3GPP2-PMIP-IPv4Session-Info	0-1	0	0-1	0-1	0-1	0-1
3GPP2-PMIP-IPv6Session-Info	0-1	0	0-1	0-1	0-1	0-1
3GPP2-PMIP-NAI	0	0	0-1	0-1	0-1	0-1
3GPP2-Release-Indicator-Prepaid	0-1	0	0-1	0-1	0-1	0-1
3GPP2-Rev-Dcch-Mux-Option	0	0	0	0-1	0-1	0-1
3GPP2-Rev-Dcch-Rc	0	0	0	0-1	0-1	0-1
3GPP2-Reverse-Fundamental-Rate	0	0	0	1	1	1
3GPP2-Reverse-Fundamental-RC	0	0	0	1	1	1
3GPP2-Reverse-Mux-Option	0	0	0	1	1	1
3GPP2-Reverse-Traffic-Type	0	0	0	1	1	1
3GPP2-Rev-Pdch-Rc	0	0	0	0-1	0-1	0-1
3GPP2-RP-Session-ID	1	0	0	1	1	1
3GPP2-Rsvp-Signal-In-Count	0	0	0	0	0-1	0-1
3GPP2-Rsvp-Signal-In-Packets	0	0	0	0	0-1	0-1
3GPP2-Rsvp-Signal-Out-Count	0	0	0	0	0-1	0-1
3GPP2-Rsvp-Signal-Out-Packets	0	0	0	0	0-1	0-1
3GPP2-SDB-Output-Octets	0	0	0	1	1	1
3GPP2-Security-Level	0	0	0-1	0	0	0
3GPP2-Service-Option	0-1	0-1	0-1	1	1	1
3GPP2-Serving-PCF	1	0	0	1	1	1
3GPP2-Session-Continue	0	0	0	0	1	1
3GPP2-Session-Term-Capability	0	0	0-1	0	0	0
3GPP2-User-Zone	1	0	0	1	1	1
3GPP-Charging-Id	1	0	0	0	0	0
3GPP-Chrg-Char	0	0-1	0-1	0	0	0
Acct-Authentic	0	0	0	1	1	1
Acct-Input-Packets	0-1	0	0	0	1	1
Acct-Interim-Interval	0	0	0-1	0	0	0
Acct-Output-Packets	0-1	0	0	0	1	1
Acct-Session-Id	0	0	0	1	1	1
Callback-Id	0	0-1	0-1	0	0	0
Called-Station-ID	1	0-1	0-1	1	1	1
Calling-Station-Id	1	0	1	1	1	1
CHAP-Challenge	0-1	0	0	0	0	0

Attribute	PDSN or FA Access-Request	PDSN or FA Access-Reject	PDSN or FA Access-Accept	PDSN or FA Acct-Request-Start	PDSN or FA Acct-Request-Interim	PDSN or FA Acct-Request-Stop
Class	0-1	0-1	0+	0+	0+	0+
Connect-Info	1	0	0-1	1	1	1
CS-Prepaid-Quota	0-1	0	0-1	0-1	0-1	0-1
CS-Prepaid-Time-Quota	0-1	0	0-1	0-1	0-1	0-1
CS-Prepaid-Volume-Quota	0-1	0	0-1	0-1	0-1	0-1
CS-Service-Name	0-1	0	0-1	0-1	0-1	0-1
CUI	0-1	0-1	0-1	0-1	0-1	0-1
EAP-Message	0+	1	0+	0	0	0
Error-Cause	0	0-1	0	0	0	0
Framed-Compression	0	0	0-1	0-1	0-1	0-1
Framed-Interface-Id	0-1	0	0-1	0-1	0-1	0-1
Framed-IP-Address	0-1	0-1	0-1	1	1	1
Framed-IP-Netmask	0-1	0	0-1	0-1	0-1	0-1
Framed-IPv6-Pool	0	0	0-1	0	0	0
Framed-IPv6-Prefix	0+	0	0+	0+	0+	0+
Framed-MTU	0	0	0-1	0-1	0-1	0-1
Framed-Pool	0	0-1	0+	0	0	0
Framed-Protocol	1	0	0-1	1	1	1
Idle-Timeout	0	0	0-1	0	0	0
NAS-Port	1	0	0	1	1	1
NAS-Port-Type	1	0	0	1	1	1
Primary-DNS-Server	0	0	0-1	1	1	1
Reply-Message	0	0-1	0-1	0	0	0
Secondary-DNS-Server	0	0	0-1	1	1	1
Service-Type	1	0	0-1	1	1	1
Session-Timeout	0	0	0-1	0	0	0
SN1-Access-link-IP-Frag	0	0	0-1	0	0	0
SN1-Admin-Permission	0	0	0-1	0	0	0
SN1-Assigned-VLAN-ID	0	0	0-1	1	1	1
SN1-CFPolicy-ID	0	0	0-1	0	0	0
SN1-Data-Tunnel-Ignore-DF-Bit	0	0	0-1	0	0	0
SN1-DHCP-Lease-Expiry-Policy	0	0	0-1	0	0	0
SN1-Disconnect-Reason	0	0	0	0	0	1
SN1-DNS-Proxy-Intercept-List	0	0	1	0	0	0
SN1-DNS-Proxy-Use-Subscr-Addr	0	0	1	0	0	0
SN1-Enable-QoS-Renegotiation	0	0	0-1	0	0	0
SN1-Ext-Inline-Srvr-Context	0	0	0-1	0	0	0
SN1-Ext-Inline-Srvr-Down-Addr	0	0	0-1	0	0	0
SN1-Ext-Inline-Srvr-Down-VLAN	0	0	0-1	0	0	0
SN1-Ext-Inline-Srvr-Preference	0	0	0-1	0	0	0
SN1-Ext-Inline-Srvr-Up-Addr	0	0	0-1	0	0	0
SN1-Ext-Inline-Srvr-Up-VLAN	0	0	0-1	0	0	0
SN1-Firewall-Enabled	0	0	0	1	1	1
SN1-FMC-Location	0	0	0	0-1	0-1	0-1
SN1-HA-Send-DNS-Address	0	0	0-1	0	0	0
SN1-Inactivity-Time	0	0	0-1	0	0	0
SN1-IP-Alloc-Method	0	0	0-1	0	0	0

Attribute	PDSN or FA Access-Request	PDSN or FA Access-Reject	PDSN or FA Access-Accept	PDSN or FA Acct-Request-Start	PDSN or FA Acct-Request-Interim	PDSN or FA Acct-Request-Stop
SN1-IP-Filter-In	0	0	0+	0	0	0
SN1-IP-Filter-Out	0	0	0+	0	0	0
SN1-IP-Header-Compression	0	0	0-1	0-1	0-1	0-1
SN1-IP-Hide-Service-Address	0	0	0-1	0	0	0
SN1-IP-In-Plcy-Grp	0	0	0-1	0	0	0
SN1-IP-Out-Plcy-Grp	0	0	0-1	0	0	0
SN1-IP-Pool-Name	0	0-1	0+	0	0	0
SN1-IP-Source-Validation	0	0	0-1	0	0	0
SN1-IP-Source-Violate-No-Acct	0	0	0-1	0	0	0
SN1-IPv6-DNS-Proxy	0	0	0-1	0	0	0
SN1-IPv6-Egress-Filtering	0	0	0-1	0	0	0
SN1-IPv6-Min-Link-MTU	0	0	0-1	0	0	0
SN1-IPv6-num-rtr-advt	0	0	0-1	0	0	0
SN1-IPv6-Primary-DNS	0	0	0-1	0	0	0
SN1-IPv6-rtr-advt-interval	0	0	0-1	0	0	0
SN1-IPv6-Secondary-DNS	0	0	0-1	0	0	0
SN1-IPv6-Sec-Pool	0	0	0+	0	0	0
SN1-IPv6-Sec-Prefix	0	0	0+	0	0	0
SN1-L3-to-L2-Tun-Addr-Policy	0	0	0-1	0	0	0
SN1-Local-IP-Address	0-1	0	0-1	1	1	1
SN1-Long-Duration-Action	0	0	0-1	0	0	0
SN1-Long-Duration-Notification	0	0	0-1	0	0	0
SN1-Long-Duration-Timeout	0	0	0-1	0	0	0
SN1-Min-Compress-Size	0	0	0-1	0	0	0
SN1-MIP-AAA-Assign-Addr	0	0	0-1	0	0	0
SN1-MIP-ANCID	0	0	0	0-1	0-1	0-1
SN1-MIP-HA-Assignment-Table	0	0	1	0	0	0
SN1-MIP-Match-AAA-Assign-Addr	0	0	0-1	0	0	0
SN1-MIP-Send-Ancid	0	0	0-1	0	0	0
SN1-MIP-Send-Correlation-Info	0	0	0-1	0	0	0
SN1-MIP-Send-Imsi	0	0	0-1	0	0	0
SN1-MIP-Send-Term-Verification	0	0	0-1	0	0	0
SN1-NAI-Construction-Domain	0	0	0-1	0	0	0
SN1-NPU-Qos-Priority	0	0	0-1	0	0	0
SN1-Overload-Disc-Connect-Time	0	0	0-1	0	0	0
SN1-Overload-Disc-Inact-Time	0	0	0-1	0	0	0
SN1-Overload-Disconnect	0	0	0-1	0	0	0
SN1-PDIF-MIP-Release-TIA	0	0	0-1	0	0	0
SN1-PDIF-MIP-Required	0	0	0-1	0	0	0
SN1-PDIF-MIP-Simple-IP-Fallback	0	0	0-1	0	0	0
SN1-PDSN-Handoff-Req-IP-Addr	0	0	0-1	0	0	0
SN1-Permit-User-Mcast-PDUs	0	0	0-1	0	0	0
SN1-PPP-Accept-Peer-v6Ifid	0	0	0-1	0	0	0
SN1-PPP-Always-On-Vse	0	0	0-1	0	0	0
SN1-PPP-Data-Compression	0	0	0-1	0-1	0-1	0-1
SN1-PPP-Data-Compression-Mode	0	0	0-1	0-1	0-1	0-1
SN1-PPP-Keepalive	0	0	0-1	0	0	0

Attribute	PDSN or FA Access-Request	PDSN or FA Access-Reject	PDSN or FA Access-Accept	PDSN or FA Acct-Request-Start	PDSN or FA Acct-Request-Interim	PDSN or FA Acct-Request-Stop
SN1-PPP-NW-Layer-IPv4	0	0	0-1	0	0	0
SN1-PPP-NW-Layer-IPv6	0	0	0-1	0	0	0
SN1-PPP-Outbound-Password	0	0	0-1	0	0	0
SN1-PPP-Outbound-Username	0	0	0-1	0	0	0
SN1-PPP-Progress-Code	0	0	0	0	0	0-1
SN1-PPP-Reneg-Disc	0	0	0-1	0	0	0
SN1-Prepaid	0	0	0-1	0	0	0
SN1-Prepaid-Compressed-Count	0-1	0	0-1	0	0	0
SN1-Prepaid-Final-Duration-Alg	0	0	0-1	0	0	0
SN1-Prepaid-Inbound-Octets	0-1	0	0-1	0	0	0
SN1-Prepaid-Outbound-Octets	0-1	0	0-1	0	0	0
SN1-Prepaid-Preference	0	0	0-1	0	0	0
SN1-Prepaid-Timeout	0-1	0	0-1	0	0	0
SN1-Prepaid-Total-Octets	0-1	0	0-1	0	0	0
SN1-Prepaid-Watermark	0-1	0	0-1	0	0	0
SN1-Primary-DCCA-Peer	0	0	0-1	0	0	0
SN1-Primary-DNS-Server	0	0	0-1	1	1	1
SN1-Primary-NBNS-Server	0	0	0-1	1	1	1
SN1-Proxy-MIP	0	0	0-1	0-1	0-1	0-1
SN1-QoS-Background-Class	0	0	0-1	0	0	0
SN1-QoS-Conversation-Class	0	0	0-1	0	0	0
SN1-QoS-Interactive1-Class	0	0	0-1	0	0	0
SN1-QoS-Interactive2-Class	0	0	0-1	0	0	0
SN1-QoS-Interactive3-Class	0	0	0-1	0	0	0
SN1-QoS-Renegotiation-Timeout	0	0	0-1	0	0	0
SN1-QoS-Streaming-Class	0	0	0-1	0	0	0
SN1-QoS-Tp-DnIk	0	0	0-1	0	0	0
SN1-QoS-Tp-Uplk	0	0	0-1	0	0	0
SN1-Re-CHAP-Interval	0	0	0-1	0-1	0-1	0-1
SN1-ROHC-Direction	0	0	0-1	0-1	0-1	0-1
SN1-ROHC-Flow-Marking-Mode	0	0	0-1	0	0	0
SN1-ROHC-Mode	0	0	0-1	0-1	0-1	0-1
SN1-ROHC-Profile-Name	0	0	0-1	0	0	0
SN1-Rulebase	0	0	0-1	1	1	1
SN1-Secondary-DCCA-Peer	0	0	0-1	0	0	0
SN1-Secondary-DNS-Server	0	0	0-1	1	1	1
SN1-Secondary-NBNS-Server	0	0	0-1	1	1	1
SN1-Service-Address	0-1	0	0	0	0	0
SN1-Simultaneous-SIP-MIP	0	0	0-1	0	0	0
SN1-Subs-Acc-Flow-Traffic-Valid	0	0	0-1	0	0	0
SN1-Subscriber-Accounting	0	0	0-1	1	1	1
SN1-Subscriber-Acct-Interim	0	0	0-1	0	0	0
SN1-Subscriber-Acct-Mode	0	0	0-1	0	0	0
SN1-Subscriber-Acct-Rsp-Action	0	0	0-1	0	0	0
SN1-Subscriber-Acct-Start	0	0	0-1	0	0	0
SN1-Subscriber-Acct-Stop	0	0	0-1	0	0	0
SN1-Subscriber-Class	0	0	0-1	0-1	0-1	0-1

Attribute	PDSN or FA Access-Request	PDSN or FA Access-Reject	PDSN or FA Access-Accept	PDSN or FA Acct-Request-Start	PDSN or FA Acct-Request-Interim	PDSN or FA Acct-Request-Stop
SN1-Subscriber-Dormant-Activity	0	0	0-1	0	0	0
SN1-Subscriber-IP-Hdr-Neg-Mode	0	0	0-1	0	0	0
SN1-Subscriber-IP-TOS-Copy	0	0	0-1	0	0	0
SN1-Subscriber-Nexthop-Address	0	0	0-1	1	1	1
SN1-Subscriber-No-Interims	0	0	0-1	0	0	0
SN1-Subscriber-Permission	0	0	0-1	0	0	0
SN1-Subs-IMSA-Service-Name	0	0	0-1	0	0	0
SN1-Subs-VJ-Slotid-Cmp-Neg-Mode	0	0	0-1	0	0	0
SN1-Tp-Dnlk-Burst-Size	0	0	0-1	0	0	0
SN1-Tp-Dnlk-Committed-Data-Rate	0	0	0-1	0	0	0
SN1-Tp-Dnlk-Exceed-Action	0	0	0-1	0	0	0
SN1-Tp-Dnlk-Peak-Data-Rate	0	0	0-1	0	0	0
SN1-Tp-Dnlk-Violate-Action	0	0	0-1	0	0	0
SN1-Tp-Uplk-Burst-Size	0	0	0-1	0	0	0
SN1-Tp-Uplk-Committed-Data-Rate	0	0	0-1	0	0	0
SN1-Tp-Uplk-Exceed-Action	0	0	0-1	0	0	0
SN1-Tp-Uplk-Peak-Data-Rate	0	0	0-1	0	0	0
SN1-Tp-Uplk-Violate-Action	0	0	0-1	0	0	0
SN1-Tun-Addr-Policy	0	0	0-1	0	0	0
SN1-Tunnel-ISAKMP-Crypto-Map	0	0	0-1	0	0	0
SN1-Tunnel-ISAKMP-Secret	0	0	0-1	0	0	0
SN1-Tunnel-Load-Balancing	0	0	0-1	0	0	0
SN1-Unclassify-List-Name	0	0	0-1	0	0	0
SN1-Voice-Push-List-Name	0	0	0-1	0	0	0
SN1-VPN-ID	0	0	0-1	0-1	0-1	0-1
SN1-VPN-Name	0	0	1	0-1	0-1	0-1
SN-Access-link-IP-Frag	0	0	0-1	0	0	0
SN-Acs-Credit-Control-Group	0	0	0-1	0-1	0-1	0-1
SN-Admin-Permission	0	0	0-1	0	0	0
SN-Assigned-VLAN-ID	0	0	0-1	1	1	1
SN-Bandwidth-Policy	0	0	1	0	0	0
SN-CBB-Policy	0	0	1	0	0	0
SN-CFPolicy-ID	0	0	0-1	0	0	0
SN-Data-Tunnel-Ignore-DF-Bit	0	0	0-1	0	0	0
SN-DHCP-Lease-Expiry-Policy	0	0	0-1	0	0	0
SN-DHCP-Options	0	0	0-1	0	0	0
SN-Direction	0	0	0-1	0-1	0-1	0-1
SN-Disconnect-Reason	0	0	0	0	0	1
SN-DNS-Proxy-Intercept-List	0	0	1	0	0	0
SN-DNS-Proxy-Use-Subscr-Addr	0	0	1	0	0	0
SN-Enable-QoS-Renegotiation	0	0	0-1	0	0	0
SN-Ext-Inline-Srvr-Context	0	0	0-1	0	0	0
SN-Ext-Inline-Srvr-Down-Addr	0	0	0-1	0	0	0
SN-Ext-Inline-Srvr-Down-VLAN	0	0	0-1	0	0	0
SN-Ext-Inline-Srvr-Preference	0	0	0-1	0	0	0
SN-Ext-Inline-Srvr-Up-Addr	0	0	0-1	0	0	0
SN-Ext-Inline-Srvr-Up-VLAN	0	0	0-1	0	0	0

Attribute	PDSN or FA Access-Request	PDSN or FA Access-Reject	PDSN or FA Access-Accept	PDSN or FA Acct-Request-Start	PDSN or FA Acct-Request-Interim	PDSN or FA Acct-Request-Stop
SN-Fast-Reauth-Username	0	0	0-1	0	0	0
SN-Firewall-Enabled	0	0	0	1	1	1
SN-Firewall-Policy	0	0	1	0	0	0
SN-FMC-Location	0	0	0	0-1	0-1	0-1
SN-HA-Send-DNS-Address	0	0	0-1	0	0	0
SN-Inactivity-Time	0	0	0-1	0	0	0
SN-IP-Alloc-Method	0	0	0-1	0	0	0
SN-IP-Filter-In	0	0	0+	0	0	0
SN-IP-Filter-Out	0	0	0+	0	0	0
SN-IP-Header-Compression	0	0	0-1	0-1	0-1	0-1
SN-IP-Hide-Service-Address	0	0	0-1	0	0	0
SN-IP-In-Plcy-Grp	0	0	0-1	0	0	0
SN-IP-Out-Plcy-Grp	0	0	0-1	0	0	0
SN-IP-Pool-Name	0	0-1	0+	0	0	0
SN-IP-Source-Validation	0	0	0-1	0	0	0
SN-IP-Source-Violate-No-Acct	0	0	0-1	0	0	0
SN-IPv6-DNS-Proxy	0	0	0-1	0	0	0
SN-IPv6-Egress-Filtering	0	0	0-1	0	0	0
SN-IPv6-Min-Link-MTU	0	0	0-1	0	0	0
SN-IPv6-num-rtr-advt	0	0	0-1	0	0	0
SN-IPv6-Primary-DNS	0	0	0-1	0	0	0
SN-IPv6-rtr-advt-interval	0	0	0-1	0	0	0
SN-IPv6-Secondary-DNS	0	0	0-1	0	0	0
SN-IPv6-Sec-Pool	0	0	0+	0	0	0
SN-IPv6-Sec-Prefix	0	0	0+	0	0	0
SN-L3-to-L2-Tun-Addr-Policy	0	0	0-1	0	0	0
SN-Local-IP-Address	0-1	0	0-1	1	1	1
SN-Long-Duration-Action	0	0	0-1	0	0	0
SN-Long-Duration-Notification	0	0	0-1	0	0	0
SN-Long-Duration-Timeout	0	0	0-1	0	0	0
SN-Min-Compress-Size	0	0	0-1	0	0	0
SN-MIP-AAA-Assign-Addr	0	0	0-1	0	0	0
SN-MIP-ANCID	0	0	0	0-1	0-1	0-1
SN-MIP-HA-Assignment-Table	0	0	1	0	0	0
SN-MIP-Match-AAA-Assign-Addr	0	0	0-1	0	0	0
SN-MIP-Send-Ancid	0	0	0-1	0	0	0
SN-MIP-Send-Correlation-Info	0	0	0-1	0	0	0
SN-MIP-Send-Host-Config	0	0	0-1	0	0	0
SN-MIP-Send-Imsi	0	0	0-1	0	0	0
SN-MIP-Send-Term-Verification	0	0	0-1	0	0	0
SN-Mode	0	0	0-1	0-1	0-1	0-1
SN-NAI-Construction-Domain	0	0	0-1	0	0	0
SN-NPU-Qos-Priority	0	0	0-1	0	0	0
SN-Overload-Disc-Connect-Time	0	0	0-1	0	0	0
SN-Overload-Disc-Inact-Time	0	0	0-1	0	0	0
SN-Overload-Disconnect	0	0	0-1	0	0	0
SN-PDG-TTG-Required	0	0	0-1	0	0	0

Attribute	PDSN or FA Access-Request	PDSN or FA Access-Reject	PDSN or FA Access-Accept	PDSN or FA Acct-Request-Start	PDSN or FA Acct-Request-Interim	PDSN or FA Acct-Request-Stop
SN-PDIF-MIP-Release-TIA	0	0	0-1	0	0	0
SN-PDIF-MIP-Required	0	0	0-1	0	0	0
SN-PDIF-MIP-Simple-IP-Fallback	0	0	0-1	0	0	0
SN-PDSN-Handoff-Req-IP-Addr	0	0	0-1	0	0	0
SN-Permit-User-Mcast-PDUs	0	0	0-1	0	0	0
SN-PPP-Accept-Peer-v6Ifid	0	0	0-1	0	0	0
SN-PPP-Always-On-Vse	0	0	0-1	0	0	0
SN-PPP-Data-Compression	0	0	0-1	0-1	0-1	0-1
SN-PPP-Data-Compression-Mode	0	0	0-1	0-1	0-1	0-1
SN-PPP-Keepalive	0	0	0-1	0	0	0
SN-PPP-NW-Layer-IPv4	0	0	0-1	0	0	0
SN-PPP-NW-Layer-IPv6	0	0	0-1	0	0	0
SN-PPP-Outbound-Password	0	0	0-1	0	0	0
SN-PPP-Outbound-Username	0	0	0-1	0	0	0
SN-PPP-Progress-Code	0	0	0	0	0	0-1
SN-PPP-Reneg-Disc	0	0	0-1	0	0	0
SN-Prepaid	0	0	0-1	0	0	0
SN-Prepaid-Compressed-Count	0-1	0	0-1	0	0	0
SN-Prepaid-Final-Duration-Alg	0	0	0-1	0	0	0
SN-Prepaid-Inbound-Octets	0-1	0	0-1	0	0	0
SN-Prepaid-Outbound-Octets	0-1	0	0-1	0	0	0
SN-Prepaid-Preference	0	0	0-1	0	0	0
SN-Prepaid-Timeout	0-1	0	0-1	0	0	0
SN-Prepaid-Total-Octets	0-1	0	0-1	0	0	0
SN-Prepaid-Watermark	0-1	0	0-1	0	0	0
SN-Primary-DCCA-Peer	0	0	0-1	0	0	0
SN-Primary-DNS-Server	0	0	0-1	1	1	1
SN-Primary-NBNS-Server	0	0	0-1	1	1	1
SN-Proxy-MIP	0	0	0-1	0-1	0-1	0-1
SN-Pseudonym-Username	0	0	0-1	0	0	0
SN-QoS-Background-Class	0	0	0-1	0	0	0
SN-QoS-Conversation-Class	0	0	0-1	0	0	0
SN-QOS-HLR-Profile	0	0	0-1	0	0	0
SN-QoS-Interactive1-Class	0	0	0-1	0	0	0
SN-QoS-Interactive2-Class	0	0	0-1	0	0	0
SN-QoS-Interactive3-Class	0	0	0-1	0	0	0
SN-QoS-Renegotiation-Timeout	0	0	0-1	0	0	0
SN-QoS-Streaming-Class	0	0	0-1	0	0	0
SN-QoS-Tp-Dnlk	0	0	0-1	0	0	0
SN-QoS-Tp-Uplk	0	0	0-1	0	0	0
SN-Re-CHAP-Interval	0	0	0-1	0-1	0-1	0-1
SN-ROHC-Flow-Marking-Mode	0	0	0-1	0	0	0
SN-ROHC-Profile-Name	0	0	0-1	0	0	0
SN-Rulebase	0	0	0-1	1	1	1
SN-Sec-IP-Pool-Name	0	0	0+	0	0	0
SN-Secondary-DCCA-Peer	0	0	0-1	0	0	0
SN-Secondary-DNS-Server	0	0	0-1	1	1	1

Attribute	PDSN or FA Access-Request	PDSN or FA Access-Reject	PDSN or FA Access-Accept	PDSN or FA Acct-Request-Start	PDSN or FA Acct-Request-Interim	PDSN or FA Acct-Request-Stop
SN-Secondary-NBNS-Server	0	0	0-1	1	1	1
SN-Service-Address	0-1	0	0	0	0	0
SN-Simultaneous-SIP-MIP	0	0	0-1	0	0	0
SN-Subs-Acc-Flow-Traffic-Valid	0	0	0-1	0	0	0
SN-Subscriber-Accounting	0	0	0-1	1	1	1
SN-Subscriber-Acct-Interim	0	0	0-1	0	0	0
SN-Subscriber-Acct-Mode	0	0	0-1	0	0	0
SN-Subscriber-Acct-Rsp-Action	0	0	0-1	0	0	0
SN-Subscriber-Acct-Start	0	0	0-1	0	0	0
SN-Subscriber-Acct-Stop	0	0	0-1	0	0	0
SN-Subscriber-Class	0	0	0-1	0-1	0-1	0-1
SN-Subscriber-Dormant-Activity	0	0	0-1	0	0	0
SN-Subscriber-IP-Hdr-Neg-Mode	0	0	0-1	0	0	0
SN-Subscriber-IP-TOS-Copy	0	0	0-1	0	0	0
SN-Subscriber-Nexthop-Address	0	0	0-1	1	1	1
SN-Subscriber-No-Interims	0	0	0-1	0	0	0
SN-Subscriber-Permission	0	0	0-1	0	0	0
SN-Subs-IMSA-Service-Name	0	0	0-1	0	0	0
SN-Subs-VJ-Slotid-Cmp-Neg-Mode	0	0	0-1	0	0	0
SN-Tp-Dnlk-Burst-Size	0	0	0-1	0	0	0
SN-Tp-Dnlk-Committed-Data-Rate	0	0	0-1	0	0	0
SN-Tp-Dnlk-Exceed-Action	0	0	0-1	0	0	0
SN-Tp-Dnlk-Peak-Data-Rate	0	0	0-1	0	0	0
SN-Tp-Dnlk-Violate-Action	0	0	0-1	0	0	0
SN-TPO-Policy	0	0	0-1	0	0	0
SN-Tp-Uplk-Burst-Size	0	0	0-1	0	0	0
SN-Tp-Uplk-Committed-Data-Rate	0	0	0-1	0	0	0
SN-Tp-Uplk-Exceed-Action	0	0	0-1	0	0	0
SN-Tp-Uplk-Peak-Data-Rate	0	0	0-1	0	0	0
SN-Tp-Uplk-Violate-Action	0	0	0-1	0	0	0
SN-TrafficSelector-Class	0	0	0-1	0	0	0
SN-Tun-Addr-Policy	0	0	0-1	0	0	0
SN-Tunnel-ISAKMP-Crypto-Map	0	0	0-1	0	0	0
SN-Tunnel-ISAKMP-Secret	0	0	0-1	0	0	0
SN-Tunnel-Load-Balancing	0	0	0-1	0	0	0
SN-Unclassify-List-Name	0	0	0-1	0	0	0
SN-Voice-Push-List-Name	0	0	0-1	0	0	0
SN-VPN-ID	0	0	0-1	0-1	0-1	0-1
SN-VPN-Name	0	0	1	0-1	0-1	0-1
SN-WiMAX-Auth-Only	0	0	0-1	0	0	0
State	1	0-1	0-1	0	0	0
Termination-Action	0	0	0-1	0	0	0
Tunnel-Assignment-ID	0	0	0-1	1	1	1
Tunnel-Client-Auth-ID	0	0	0-1	1	1	1
Tunnel-Client-Endpoint	0	0	0-1	1	1	1
Tunnel-Medium-Type	0	0	0-1	1	1	1
Tunnel-Preference	0	0	0-1	0	0	0

Attribute	PDSN or FA Access-Request	PDSN or FA Access-Reject	PDSN or FA Access-Accept	PDSN or FA Acct-Request-Start	PDSN or FA Acct-Request-Interim	PDSN or FA Acct-Request-Stop
Tunnel-Private-Group-ID	0	0	0-1	1	1	1
Tunnel-Server-Auth-ID	0	0	0-1	1	1	1
Tunnel-Server-Endpoint	0	0	0-1	1	1	1
Tunnel-Type	0	0	0-1	1	1	1
User-Name	1	0	0-1	1	1	1
User-Password	0-1	0	0	0	0	0

## HA Attribute/Packet Table

Attribute	HA Access-Request	HA Access-Reject	HA Access-Accept	HA Acct-Request-Start	HA Acct-Request-Interim	HA Acct-Request-Stop
3GPP2-Beginning-Session	0	0	0	0-1	0	0
3GPP2-BSID	0	0	0	0-1	0-1	0-1
3GPP2-Comp-Tunnel-Indicator	0	0	0	1	1	1
3GPP2-Correlation-Id	1	0	0	1	1	1
3GPP2-DNS-Server-IPV6-Addr	0	0	0-1	0	0	0
3GPP2-DNS-Update-Required	0	0	0-1	0	0	0
3GPP2-ESN	1	0	0	0	0	0
3GPP2-FA-Address	0-1	0	0	0-1	0-1	0-1
3GPP2-IP-QOS	0	0	0-1	1	1	1
3GPP2-IP-Technology	0-1	0	0-1	0	0	0
3GPP2-MEID	0	0	0-1	0	0	0
3GPP2-MIP6-Authenticator	0-1	0	0	0	0	0
3GPP2-MIP6-CoA	0-1	0	0	0-1	0-1	0
3GPP2-MIP6-HA	0-1	0	0	0	0	0
3GPP2-MIP6-HoA	0-1	0	0	0-1	0-1	0
3GPP2-MIP6-HoA-Not-Authorized	0	0	0-1	0	0	0
3GPP2-MIP6-MAC-Mobility-Data	0-1	0	0	0	0	0
3GPP2-MIP6-Mesg-ID	0-1	0	0	0	0	0
3GPP2-MIP6-Session-Key	0	0	0-1	0	0	0
3GPP2-MN-HA-Shared-Key	0	0	0-1	0	0	0
3GPP2-MN-HA-SPI	0-1	0	0	0	0	0
3GPP2-Mobile-Term-Orig-Ind	0	0	0	1	1	1
3GPP2-Service-Option	0	0	0	0-1	0-1	0-1
3GPP2-Serving-PCF	0	0	0	1	1	1
3GPP2-Session-Continue	0	0	0	0	0	0-1
Acct-Authentic	0	0	0	1	1	1
Acct-Input-Packets	0-1	0	0	0	1	1
Acct-Interim-Interval	0	0	0-1	0	0	0
Acct-Multi-Session-Id	0	0	0	0-1	0-1	0-1
Acct-Output-Packets	0-1	0	0	0	1	1
Acct-Session-Id	0	0	0	1	1	1
Calling-Station-Id	1	0	1	1	1	1
CHAP-Challenge	1	0	0	0	0	0
Class	0	0	0-1	0-1	0-1	0-1
CUI	0-1	0	0-1	0	0	0
Error-Cause	0	0-1	0	0	0	0
Framed-IP-Address	0-1	0	0-1	1	1	1
Framed-IP-Netmask	0-1	0	0-1	0-1	0-1	0-1
Framed-IPv6-Pool	0	0	0-1	0	0	0
Framed-MTU	0	0	0-1	0-1	0-1	0-1
Framed-Pool	0	0	0+	0	0	0
Idle-Timeout	0	0	0-1	0	0	0
NAS-Port	1	0	0	1	1	1

Attribute	HA Access-Request	HA Access-Reject	HA Access-Accept	HA Acct-Request-Start	HA Acct-Request-Interim	HA Acct-Request-Stop
NAS-Port-Type	1	0	0	1	1	1
Primary-DNS-Server	0	0	0-1	1	1	1
Reply-Message	0	0-1	0-1	0	0	0
Secondary-DNS-Server	0	0	0-1	1	1	1
Service-Type	1	0	0-1	1	1	1
Session-Timeout	0	0	0-1	0	0	0
SN1-Access-link-IP-Frag	0	0	0-1	0	0	0
SN1-Admin-Permission	0	0	0-1	0	0	0
SN1-Assigned-VLAN-ID	0	0	0-1	0-1	0-1	0-1
SN1-CFPolicy-ID	0	0	0-1	0	0	0
SN1-Data-Tunnel-Ignore-DF-Bit	0	0	0-1	0	0	0
SN1-DHCP-Lease-Expiry-Policy	0	0	0-1	0	0	0
SN1-Disconnect-Reason	0	0	0	0	0	1
SN1-DNS-Proxy-Intercept-List	0	0	1	0	0	0
SN1-DNS-Proxy-Use-Subscr-Addr	0	0	1	0	0	0
SN1-Enable-QoS-Renegotiation	0	0	0-1	0	0	0
SN1-Ext-Inline-Srvr-Context	0	0	0-1	0	0	0
SN1-Ext-Inline-Srvr-Down-Addr	0	0	0-1	0	0	0
SN1-Ext-Inline-Srvr-Down-VLAN	0	0	0-1	0	0	0
SN1-Ext-Inline-Srvr-Preference	0	0	0-1	0	0	0
SN1-Ext-Inline-Srvr-Up-Addr	0	0	0-1	0	0	0
SN1-Ext-Inline-Srvr-Up-VLAN	0	0	0-1	0	0	0
SN1-Firewall-Enabled	0	0	0	1	1	1
SN1-FMC-Location	0	0	0	0-1	0-1	0-1
SN1-Gratuitous-ARP-Aggressive	0	0	0-1	0	0	0
SN1-Ignore-Unknown-HA-Addr-Err	0	0	0-1	0	0	0
SN1-IMS-AM-Address	0	0	0-1	0	0	0
SN1-IMS-AM-Domain-Name	0	0	0-1	0	0	0
SN1-Inactivity-Time	0	0	0-1	0	0	0
SN1-IP-Filter-In	0	0	0+	0	0	0
SN1-IP-Filter-Out	0	0	0+	0	0	0
SN1-IP-Hide-Service-Address	0	0	0-1	0	0	0
SN1-IP-Pool-Name	0	0	0+	0	0	0
SN1-IP-Source-Validation	0	0	0-1	0	0	0
SN1-IP-Source-Violate-No-Acct	0	0	0-1	0	0	0
SN1-IPv6-Sec-Pool	0	0	0+	0	0	0
SN1-IPv6-Sec-Prefix	0	0	0+	0	0	0
SN1-L3-to-L2-Tun-Addr-Policy	0	0	0-1	0	0	0
SN1-Local-IP-Address	0-1	0	0-1	1	1	1
SN1-Long-Duration-Action	0	0	0-1	0	0	0
SN1-Long-Duration-Notification	0	0	0-1	0	0	0
SN1-Long-Duration-Timeout	0	0	0-1	0	0	0
SN1-MIP-ANCID	0	0	0	0-1	0-1	0-1
SN1-MIP-Dual-Anchor	0	0	0-1	0	0	0
SN1-MIP-HA-Assignment-Table	0	0	1	0	0	0
SN1-MIP-Reg-Lifetime-Realm	0	0	0-1	0	0	0
SN1-MN-HA-Timestamp-Tolerance	0	0	0-1	0	0	0

Attribute	HA Access-Request	HA Access-Reject	HA Access-Accept	HA Acct-Request-Start	HA Acct-Request-Interim	HA Acct-Request-Stop
SN1-NPU-Qos-Priority	0	0	0-1	0	0	0
SN1-Nw-Reachability-Server-Name	0	0	0-1	0	0	0
SN1-Overload-Disc-Connect-Time	0	0	0-1	0	0	0
SN1-Overload-Disc-Inact-Time	0	0	0-1	0	0	0
SN1-Overload-Disconnect	0	0	0-1	0	0	0
SN1-PDSN-Correlation-Id	0	0	0	0-1	0-1	0-1
SN1-PDSN-NAS-Id	0	0	0	0-1	0-1	0-1
SN1-PDSN-NAS-IP-Address	0	0	0	0-1	0-1	0-1
SN1-Permit-User-Mcast-PDUs	0	0	0-1	0	0	0
SN1-Prepaid	0	0	0-1	0	0	0
SN1-Prepaid-Compressed-Count	0-1	0	0-1	0	0	0
SN1-Prepaid-Final-Duration-Alg	0	0	0-1	0	0	0
SN1-Prepaid-Inbound-Octets	0-1	0	0-1	0	0	0
SN1-Prepaid-Outbound-Octets	0-1	0	0-1	0	0	0
SN1-Prepaid-Preference	0	0	0-1	0	0	0
SN1-Prepaid-Timeout	0-1	0	0-1	0	0	0
SN1-Prepaid-Total-Octets	0-1	0	0-1	0	0	0
SN1-Prepaid-Watermark	0-1	0	0-1	0	0	0
SN1-Primary-DCCA-Peer	0	0	0-1	0	0	0
SN1-Primary-DNS-Server	0	0	0-1	1	1	1
SN1-Primary-NBNS-Server	0	0	0-1	1	1	1
SN1-QoS-Background-Class	0	0	0-1	0	0	0
SN1-QoS-Conversation-Class	0	0	0-1	0	0	0
SN1-QoS-Interactive1-Class	0	0	0-1	0	0	0
SN1-QoS-Interactive2-Class	0	0	0-1	0	0	0
SN1-QoS-Interactive3-Class	0	0	0-1	0	0	0
SN1-QoS-Renegotiation-Timeout	0	0	0-1	0	0	0
SN1-QoS-Streaming-Class	0	0	0-1	0	0	0
SN1-QoS-Tp-Dnlk	0	0	0-1	0	0	0
SN1-QoS-Tp-Uplk	0	0	0-1	0	0	0
SN1-Re-CHAP-Interval	0	0	0-1	0-1	0-1	0-1
SN1-Rulebase	0	0	0-1	1	1	1
SN1-Secondary-DCCA-Peer	0	0	0-1	0	0	0
SN1-Secondary-DNS-Server	0	0	0-1	1	1	1
SN1-Secondary-NBNS-Server	0	0	0-1	1	1	1
SN1-Service-Address	0-1	0	0	0	0	0
SN1-Subscriber-Accounting	0	0	0-1	1	1	1
SN1-Subscriber-Acct-Interim	0	0	0-1	0	0	0
SN1-Subscriber-Acct-Mode	0	0	0-1	0	0	0
SN1-Subscriber-Acct-Rsp-Action	0	0	0-1	0	0	0
SN1-Subscriber-Acct-Start	0	0	0-1	0	0	0
SN1-Subscriber-Acct-Stop	0	0	0-1	0	0	0
SN1-Subscriber-Class	0	0	0-1	0-1	0-1	0-1
SN1-Subscriber-IP-TOS-Copy	0	0	0-1	0	0	0
SN1-Subscriber-Nexthop-Address	0	0	0-1	1	1	1
SN1-Subscriber-No-Interims	0	0	0-1	0	0	0
SN1-Subscriber-Permission	0	0	0-1	0	0	0

Attribute	HA Access-Request	HA Access-Reject	HA Access-Accept	HA Acct-Request-Start	HA Acct-Request-Interim	HA Acct-Request-Stop
SN1-Subs-IMSA-Service-Name	0	0	0-1	0	0	0
SN1-Tp-Dnlk-Burst-Size	0	0	0-1	0	0	0
SN1-Tp-Dnlk-Committed-Data-Rate	0	0	0-1	0	0	0
SN1-Tp-Dnlk-Exceed-Action	0	0	0-1	0	0	0
SN1-Tp-Dnlk-Peak-Data-Rate	0	0	0-1	0	0	0
SN1-Tp-Dnlk-Violate-Action	0	0	0-1	0	0	0
SN1-Tp-Uplk-Burst-Size	0	0	0-1	0	0	0
SN1-Tp-Uplk-Committed-Data-Rate	0	0	0-1	0	0	0
SN1-Tp-Uplk-Exceed-Action	0	0	0-1	0	0	0
SN1-Tp-Uplk-Peak-Data-Rate	0	0	0-1	0	0	0
SN1-Tp-Uplk-Violate-Action	0	0	0-1	0	0	0
SN1-Tun-Addr-Policy	0	0	0-1	0	0	0
SN1-Tunnel-ISAKMP-Crypto-Map	0	0	0-1	0	0	0
SN1-Tunnel-ISAKMP-Secret	0	0	0-1	0	0	0
SN1-Tunnel-Load-Balancing	0	0	0-1	0	0	0
SN1-Unclassify-List-Name	0	0	0-1	0	0	0
SN1-Voice-Push-List-Name	0	0	0-1	0	0	0
SN1-VPN-ID	0	0	0-1	0-1	0-1	0-1
SN1-VPN-Name	0	0	1	0-1	0-1	0-1
SN-Access-link-IP-Frag	0	0	0-1	0	0	0
SN-Acs-Credit-Control-Group	0	0	0-1	0-1	0-1	0-1
SN-Admin-Permission	0	0	0-1	0	0	0
SN-Assigned-VLAN-ID	0	0	0-1	0-1	0-1	0-1
SN-Bandwidth-Policy	0	0	1	0	0	0
SN-CBB-Policy	0	0	1	0	0	0
SN-CFPolicy-ID	0	0	0-1	0	0	0
SN-Data-Tunnel-Ignore-DF-Bit	0	0	0-1	0	0	0
SN-DHCP-Lease-Expiry-Policy	0	0	0-1	0	0	0
SN-Disconnect-Reason	0	0	0	0	0	1
SN-DNS-Proxy-Intercept-List	0	0	1	0	0	0
SN-DNS-Proxy-Use-Subscr-Addr	0	0	1	0	0	0
SN-Enable-QoS-Renegotiation	0	0	0-1	0	0	0
SN-Ext-Inline-Srvr-Context	0	0	0-1	0	0	0
SN-Ext-Inline-Srvr-Down-Addr	0	0	0-1	0	0	0
SN-Ext-Inline-Srvr-Down-VLAN	0	0	0-1	0	0	0
SN-Ext-Inline-Srvr-Preference	0	0	0-1	0	0	0
SN-Ext-Inline-Srvr-Up-Addr	0	0	0-1	0	0	0
SN-Ext-Inline-Srvr-Up-VLAN	0	0	0-1	0	0	0
SN-Firewall-Enabled	0	0	0	1	1	1
SN-Firewall-Policy	0	0	1	0	0	0
SN-FMC-Location	0	0	0	0-1	0-1	0-1
SN-Gratuitous-ARP-Aggressive	0	0	0-1	0	0	0
SN-Ignore-Unknown-HA-Addr-Error	0	0	0-1	0	0	0
SN-IMS-AM-Address	0	0	0-1	0	0	0
SN-IMS-AM-Domain-Name	0	0	0-1	0	0	0
SN-Inactivity-Time	0	0	0-1	0	0	0
SN-IP-Filter-In	0	0	0+	0	0	0

Attribute	HA Access-Request	HA Access-Reject	HA Access-Accept	HA Acct-Request-Start	HA Acct-Request-Interim	HA Acct-Request-Stop
SN-IP-Filter-Out	0	0	0+	0	0	0
SN-IP-Hide-Service-Address	0	0	0-1	0	0	0
SN-IP-Pool-Name	0	0	0+	0	0	0
SN-IP-Source-Validation	0	0	0-1	0	0	0
SN-IP-Source-Violate-No-Acct	0	0	0-1	0	0	0
SN-IPv6-Sec-Pool	0	0	0+	0	0	0
SN-IPv6-Sec-Prefix	0	0	0+	0	0	0
SN-L3-to-L2-Tun-Addr-Policy	0	0	0-1	0	0	0
SN-Local-IP-Address	0-1	0	0-1	1	1	1
SN-Long-Duration-Action	0	0	0-1	0	0	0
SN-Long-Duration-Notification	0	0	0-1	0	0	0
SN-Long-Duration-Timeout	0	0	0-1	0	0	0
SN-MIP-ANCID	0	0	0	0-1	0-1	0-1
SN-MIP-Dual-Anchor	0	0	0-1	0	0	0
SN-MIP-HA-Assignment-Table	0	0	1	0	0	0
SN-MIP-Reg-Lifetime-Realm	0	0	0-1	0	0	0
SN-MN-HA-Timestamp-Tolerance	0	0	0-1	0	0	0
SN-NPU-Qos-Priority	0	0	0-1	0	0	0
SN-Nw-Reachability-Server-Name	0	0	0-1	0	0	0
SN-Overload-Disc-Connect-Time	0	0	0-1	0	0	0
SN-Overload-Disc-Inact-Time	0	0	0-1	0	0	0
SN-Overload-Disconnect	0	0	0-1	0	0	0
SN-PDSN-Correlation-Id	0	0	0	0-1	0-1	0-1
SN-PDSN-NAS-Id	0	0	0	0-1	0-1	0-1
SN-PDSN-NAS-IP-Address	0	0	0	0-1	0-1	0-1
SN-Permit-User-Mcast-PDUs	0	0	0-1	0	0	0
SN-Prepaid	0	0	0-1	0	0	0
SN-Prepaid-Compressed-Count	0-1	0	0-1	0	0	0
SN-Prepaid-Final-Duration-Alg	0	0	0-1	0	0	0
SN-Prepaid-Inbound-Octets	0-1	0	0-1	0	0	0
SN-Prepaid-Outbound-Octets	0-1	0	0-1	0	0	0
SN-Prepaid-Preference	0	0	0-1	0	0	0
SN-Prepaid-Timeout	0-1	0	0-1	0	0	0
SN-Prepaid-Total-Octets	0-1	0	0-1	0	0	0
SN-Prepaid-Watermark	0-1	0	0-1	0	0	0
SN-Primary-DCCA-Peer	0	0	0-1	0	0	0
SN-Primary-DNS-Server	0	0	0-1	1	1	1
SN-Primary-NBNS-Server	0	0	0-1	1	1	1
SN-QoS-Background-Class	0	0	0-1	0	0	0
SN-QoS-Conversation-Class	0	0	0-1	0	0	0
SN-QoS-Interactive1-Class	0	0	0-1	0	0	0
SN-QoS-Interactive2-Class	0	0	0-1	0	0	0
SN-QoS-Interactive3-Class	0	0	0-1	0	0	0
SN-QoS-Renegotiation-Timeout	0	0	0-1	0	0	0
SN-QoS-Streaming-Class	0	0	0-1	0	0	0
SN-QoS-Tp-Dnlk	0	0	0-1	0	0	0
SN-QoS-Tp-Uplk	0	0	0-1	0	0	0

Attribute	HA Access-Request	HA Access-Reject	HA Access-Accept	HA Acct-Request-Start	HA Acct-Request-Interim	HA Acct-Request-Stop
SN-Re-CHAP-Interval	0	0	0-1	0-1	0-1	0-1
SN-Rulebase	0	0	0-1	1	1	1
SN-Secondary-DCCA-Peer	0	0	0-1	0	0	0
SN-Secondary-DNS-Server	0	0	0-1	1	1	1
SN-Secondary-NBNS-Server	0	0	0-1	1	1	1
SN-Service-Address	0-1	0	0	0	0	0
SN-Subscriber-Accounting	0	0	0-1	1	1	1
SN-Subscriber-Acct-Interim	0	0	0-1	0	0	0
SN-Subscriber-Acct-Mode	0	0	0-1	0	0	0
SN-Subscriber-Acct-Rsp-Action	0	0	0-1	0	0	0
SN-Subscriber-Acct-Start	0	0	0-1	0	0	0
SN-Subscriber-Acct-Stop	0	0	0-1	0	0	0
SN-Subscriber-Class	0	0	0-1	0-1	0-1	0-1
SN-Subscriber-IP-TOS-Copy	0	0	0-1	0	0	0
SN-Subscriber-Nexthop-Address	0	0	0-1	1	1	1
SN-Subscriber-No-Interims	0	0	0-1	0	0	0
SN-Subscriber-Permission	0	0	0-1	0	0	0
SN-Subs-IMSA-Service-Name	0	0	0-1	0	0	0
SN-Tp-Dnlk-Burst-Size	0	0	0-1	0	0	0
SN-Tp-Dnlk-Committed-Data-Rate	0	0	0-1	0	0	0
SN-Tp-Dnlk-Exceed-Action	0	0	0-1	0	0	0
SN-Tp-Dnlk-Peak-Data-Rate	0	0	0-1	0	0	0
SN-Tp-Dnlk-Violate-Action	0	0	0-1	0	0	0
SN-TPO-Policy	0	0	0-1	0	0	0
SN-Tp-Uplk-Burst-Size	0	0	0-1	0	0	0
SN-Tp-Uplk-Committed-Data-Rate	0	0	0-1	0	0	0
SN-Tp-Uplk-Exceed-Action	0	0	0-1	0	0	0
SN-Tp-Uplk-Peak-Data-Rate	0	0	0-1	0	0	0
SN-Tp-Uplk-Violate-Action	0	0	0-1	0	0	0
SN-TrafficSelector-Class	0	0	0-1	0	0	0
SN-Tun-Addr-Policy	0	0	0-1	0	0	0
SN-Tunnel-ISAKMP-Crypto-Map	0	0	0-1	0	0	0
SN-Tunnel-ISAKMP-Secret	0	0	0-1	0	0	0
SN-Tunnel-Load-Balancing	0	0	0-1	0	0	0
SN-Unclassify-List-Name	0	0	0-1	0	0	0
SN-Voice-Push-List-Name	0	0	0-1	0	0	0
SN-VPN-ID	0	0	0-1	0-1	0-1	0-1
SN-VPN-Name	0	0	1	0-1	0-1	0-1
SN-WiMAX-Auth-Only	0	0	0-1	0	0	0
State	1	0	0-1	0	0	0
Tunnel-Assignment-ID	0	0	0-1	1	1	1
Tunnel-Client-Auth-ID	0	0	0-1	1	1	1
Tunnel-Client-Endpoint	0	0	0-1	1	1	1
Tunnel-Medium-Type	0	0	0-1	1	1	1
Tunnel-Preference	0	0	0-1	0	0	0
Tunnel-Private-Group-ID	0	0	0-1	1	1	1
Tunnel-Server-Auth-ID	0	0	0-1	1	1	1

Attribute	HA Access-Request	HA Access-Reject	HA Access-Accept	HA Acct-Request-Start	HA Acct-Request-Interim	HA Acct-Request-Stop
Tunnel-Server-Endpoint	0	0	0-1	1	1	1
Tunnel-Type	0	0	0-1	1	1	1
User-Name	1	0	0-1	1	1	1

## GGSN Attribute/Packet Table

Attribute	GGSN Access-Request	GGSN Access-Reject	GGSN Access-Accept	GGSN Acct-Request-Start	GGSN Acct-Request-Interim	GGSN Acct-Request-Stop
3GPP2-BSID	0	0	0	0-1	0-1	0-1
3GPP-Allocate-IPType	0-1	0	0	0	0	0
3GPP-CAMEL-Charging-Info	0-1	0	0	0-1	0-1	0-1
3GPP-CG-Address	0-1	0	0	0-1	0-1	0-1
3GPP-Charging-Id	0-1	0	0	0-1	0-1	0-1
3GPP-Chrg-Char	0-1	0-1	0-1	0-1	0-1	0-1
3GPP-GGSN-Address	0-1	0	0	0-1	0-1	0-1
3GPP-GGSN-IPv6-Address	0-1	0	0	0-1	0-1	0-1
3GPP-GGSN-Mcc-Mnc	0-1	0	0	0-1	0-1	0-1
3GPP-IMEISV	0-1	0	0	0-1	0-1	0-1
3GPP-IMSI	0-1	0	0	0-1	0-1	0-1
3GPP-IMSI-Mcc-Mnc	0-1	0	0	0-1	0-1	0-1
3GPP-IPv6-DNS-Servers	0	0	0-1	0	0	0
3GPP-MS-TimeZone	0-1	0	0	0-1	0-1	0-1
3GPP-Negotiated-DSCP	0-1	0	0	0-1	0-1	0-1
3GPP-Negotiated-QoS-Profile	0-1	0	0	0-1	0-1	0-1
3GPP-NSAPI	0-1	0	0	0-1	0-1	0-1
3GPP-PDP-Type	0-1	0	0	0-1	0-1	0-1
3GPP-RAT-Type	0-1	0	0	0-1	0-1	0-1
3GPP-Selection-Mode	0-1	0	0	0-1	0-1	0-1
3GPP-Session-Stop-Ind	0	0	0	0	0	0-1
3GPP-SGSN-Address	0-1	0	0	0-1	0-1	0-1
3GPP-SGSN-IPv6-Address	0-1	0	0	0-1	0-1	0-1
3GPP-SGSN-Mcc-Mnc	0-1	0	0	0-1	0-1	0-1
3GPP-User-Location-Info	0-1	0	0	0-1	0-1	0-1
Acct-Authentic	0	0	0	1	1	1
Acct-Input-Packets	0-1	0	0	0	0	0-1
Acct-Interim-Interval	0	0	0-1	0	0	0
Acct-Multi-Session-Id	0-1	0	0	1	1	1
Acct-Output-Packets	0-1	0	0	0	0	0-1
Acct-Session-Id	0-1	0	0	1	1	1
Callback-Id	0	0-1	0-1	0	0	0
Called-Station-ID	1	0	0	1	1	1
Calling-Station-Id	0-1	0	0	0-1	0-1	0-1
CHAP-Challenge	0-1	0	0	0	0	0
Class	0	0	0+	0-1	0-1	0-1
CUI	0	0	0-1	0-1	0-1	0-1
EAP-Message	0+	1	0+	0	0	0
Error-Cause	0	0-1	0	0	0	0
Framed-Compression	0	0	0-1	0-1	0-1	0-1
Framed-Interface-Id	0-1	0	0-1	0-1	0-1	0-1
Framed-IP-Address	0-1	0	1	0-1	0-1	0-1
Framed-IP-Netmask	0	0	0	0-1	0-1	0-1

Attribute	GGSN Access-Request	GGSN Access-Reject	GGSN Access-Accept	GGSN Acct-Request-Start	GGSN Acct-Request-Interim	GGSN Acct-Request-Stop
Framed-IPv6-Prefix	0+	0	0+	0+	0+	0+
Framed-MTU	0-1	0	0-1	0-1	0-1	0-1
Framed-Protocol	0-1	0	0-1	0-1	0-1	0-1
Geographical-Location	0-1	0	0	0	0	0
HNB-Internet-Information	0-1	0	0	0	0	0
HNB-Parameters	1	0	0	0	0	0
Idle-Timeout	0	0	0-1	0	0	0
Macro-Coverage-Information	0-1	0	0	0	0	0
NAS-Port-Type	0-1	0	0	0-1	0	0-1
Primary-DNS-Server	0	0	0-1	0	0	0
Reject-Cause	0	1	0	0	0	0
Reply-Message	0	0-1	0-1	0	0	0
Secondary-DNS-Server	0	0	0-1	0	0	0
Service-Type	0-1	0	0-1	0-1	0	0-1
Session-Timeout	0-1	0	0-1	0	0	0
SN1-Access-link-IP-Frag	0	0	0-1	0	0	0
SN1-Assigned-VLAN-ID	0	0	0-1	0-1	0-1	0-1
SN1-CPolicy-ID	0	0	0-1	0	0	0
SN1-Data-Tunnel-Ignore-DF-Bit	0	0	0-1	0	0	0
SN1-DHCP-Lease-Expiry-Policy	0	0	0-1	0	0	0
SN1-Disconnect-Reason	0	0	0	0	0-1	0-1
SN1-DNS-Proxy-Intercept-List	0	0	1	0	0	0
SN1-DNS-Proxy-Use-Subscr-Addr	0	0	1	0	0	0
SN1-Ecs-Data-Volume	0	0	0	0-1	0-1	0-1
SN1-Enable-QoS-Renegotiation	0	0	0-1	0	0	0
SN1-Ext-Inline-Srvr-Context	0	0	0-1	0	0	0
SN1-Ext-Inline-Srvr-Down-Addr	0	0	0-1	0	0	0
SN1-Ext-Inline-Srvr-Down-VLAN	0	0	0-1	0	0	0
SN1-Ext-Inline-Srvr-Preference	0	0	0-1	0	0	0
SN1-Ext-Inline-Srvr-Up-Addr	0	0	0-1	0	0	0
SN1-Ext-Inline-Srvr-Up-VLAN	0	0	0-1	0	0	0
SN1-Firewall-Enabled	0	0	0	1	1	1
SN1-GTP-Version	0-1	0	0	0-1	0-1	0-1
SN1-Home-Behavior	0	0	0-1	0	0	0
SN1-Home-Profile	0	0	0-1	0	0	0
SN1-Home-Sub-Use-GGSN	0	0	0-1	0	0	0
SN1-Inactivity-Time	0	0	0-1	0	0	0
SN1-IP-Filter-In	0	0	0+	0	0	0
SN1-IP-Filter-Out	0	0	0+	0	0	0
SN1-IP-Hide-Service-Address	0	0	0-1	0	0	0
SN1-IP-In-Plcy-Grp	0	0	0-1	0	0	0
SN1-IP-Out-Plcy-Grp	0	0	0-1	0	0	0
SN1-IP-Source-Validation	0	0	0-1	0	0	0
SN1-IP-Source-Violate-No-Acct	0	0	0-1	0	0	0
SN1-IPv6-DNS-Proxy	0	0	0-1	0	0	0
SN1-IPv6-Egress-Filtering	0	0	0-1	0	0	0
SN1-IPv6-Min-Link-MTU	0	0	0-1	0	0	0

Attribute	GGSN Access-Request	GGSN Access-Reject	GGSN Access-Accept	GGSN Acct-Request-Start	GGSN Acct-Request-Interim	GGSN Acct-Request-Stop
SN1-IPv6-num-rtr-advt	0	0	0-1	0	0	0
SN1-IPv6-Primary-DNS	0	0	0-1	0	0	0
SN1-IPv6-rtr-advt-interval	0	0	0-1	0	0	0
SN1-IPv6-Secondary-DNS	0	0	0-1	0	0	0
SN1-IPv6-Sec-Pool	0	0	0+	0	0	0
SN1-IPv6-Sec-Prefix	0	0	0+	0	0	0
SN1-L3-to-L2-Tun-Addr-Policy	0	0	0-1	0	0	0
SN1-Local-IP-Address	0-1	0	0-1	1	1	1
SN1-Long-Duration-Action	0	0	0-1	0	0	0
SN1-Long-Duration-Notification	0	0	0-1	0	0	0
SN1-Long-Duration-Timeout	0	0	0-1	0	0	0
SN1-Mediation-Acct-Rsp-Action	0	0	0-1	1	1	1
SN1-Mediation-Enabled	0	0	0-1	1	1	1
SN1-Mediation-No-Interims	0	0	0-1	1	1	1
SN1-Mediation-VPN-Name	0	0	0-1	1	1	1
SN1-Min-Compress-Size	0	0	0-1	0	0	0
SN1-MIP-HA-Assignment-Table	0	0	1	0	0	0
SN1-NPU-Qos-Priority	0	0	0-1	0	0	0
SN1-Overload-Disc-Connect-Time	0	0	0-1	0	0	0
SN1-Overload-Disc-Inact-Time	0	0	0-1	0	0	0
SN1-Overload-Disconnect	0	0	0-1	0	0	0
SN1-Permit-User-Mcast-PDUs	0	0	0-1	0	0	0
SN1-PPP-Accept-Peer-v6Ifid	0	0	0-1	0	0	0
SN1-PPP-Always-On-Vse	0	0	0-1	0	0	0
SN1-PPP-Data-Compression	0	0	0-1	0-1	0-1	0-1
SN1-PPP-Data-Compression-Mode	0	0	0-1	0-1	0-1	0-1
SN1-PPP-Keepalive	0	0	0-1	0	0	0
SN1-PPP-NW-Layer-IPv4	0	0	0-1	0	0	0
SN1-PPP-NW-Layer-IPv6	0	0	0-1	0	0	0
SN1-PPP-Outbound-Username	0	0	0-1	0	0	0
SN1-PPP-Reneg-Disc	0	0	0-1	0	0	0
SN1-Primary-DCCA-Peer	0	0	0-1	0-1	0-1	0-1
SN1-Primary-DNS-Server	0	0	0-1	0	0	0
SN1-Primary-NBNS-Server	0	0	0-1	0	0	0
SN1-QoS-Background-Class	0	0	0-1	0	0	0
SN1-QoS-Conversation-Class	0	0	0-1	0	0	0
SN1-QoS-Interactive1-Class	0	0	0-1	0	0	0
SN1-QoS-Interactive2-Class	0	0	0-1	0	0	0
SN1-QoS-Interactive3-Class	0	0	0-1	0	0	0
SN1-QoS-Renegotiation-Timeout	0	0	0-1	0	0	0
SN1-QoS-Streaming-Class	0	0	0-1	0	0	0
SN1-QoS-Tp-Dnlk	0	0	0-1	0	0	0
SN1-QoS-Tp-Uplk	0	0	0-1	0	0	0
SN1-Radius-Returned-Username	0	0	0-1	0	0	0
SN1-Re-CHAP-Interval	0	0	0-1	0	0	0
SN1-Roaming-Behavior	0	0	0-1	0	0	0
SN1-Roaming-Profile	0	0	0-1	0	0	0

Attribute	GGSN Access-Request	GGSN Access-Reject	GGSN Access-Accept	GGSN Acct-Request-Start	GGSN Acct-Request-Interim	GGSN Acct-Request-Stop
SN1-Roaming-Sub-Use-GGSN	0	0	0-1	0	0	0
SN1-ROHC-Flow-Marking-Mode	0	0	0-1	0	0	0
SN1-ROHC-Profile-Name	0	0	0-1	0	0	0
SN1-Rulebase	0	0	0-1	1	1	1
SN1-Secondary-DCCA-Peer	0	0	0-1	0	0	0
SN1-Secondary-DNS-Server	0	0	0-1	0	0	0
SN1-Secondary-NBNS-Server	0	0	0-1	0	0	0
SN1-Subs-Acc-Flow-Traffic-Valid	0	0	0-1	0	0	0
SN1-Subscriber-Accounting	0	0	0-1	1	1	1
SN1-Subscriber-Acct-Interim	0	0	0-1	0	0	0
SN1-Subscriber-Acct-Mode	0	0	0-1	0	0	0
SN1-Subscriber-Acct-Rsp-Action	0	0	0-1	0	0	0
SN1-Subscriber-Acct-Start	0	0	0-1	0	0	0
SN1-Subscriber-Acct-Stop	0	0	0-1	0	0	0
SN1-Subscriber-Dormant-Activity	0	0	0-1	0	0	0
SN1-Subscriber-IP-Hdr-Neg-Mode	0	0	0-1	0	0	0
SN1-Subscriber-IP-TOS-Copy	0	0	0-1	0	0	0
SN1-Subscriber-Nexthop-Address	0	0	0-1	1	1	1
SN1-Subscriber-No-Interims	0	0	0-1	0	0	0
SN1-Subscriber-Permission	0	0	0-1	0	0	0
SN1-Subs-IMSA-Service-Name	0	0	0-1	0	0	0
SN1-Subs-VJ-Slotid-Cmp-Neg-Mode	0	0	0-1	0	0	0
SN1-Tp-Dnlk-Burst-Size	0	0	0-1	0	0	0
SN1-Tp-Dnlk-Committed-Data-Rate	0	0	0-1	0	0	0
SN1-Tp-Dnlk-Exceed-Action	0	0	0-1	0	0	0
SN1-Tp-Dnlk-Peak-Data-Rate	0	0	0-1	0	0	0
SN1-Tp-Dnlk-Violate-Action	0	0	0-1	0	0	0
SN1-Tp-Uplk-Burst-Size	0	0	0-1	0	0	0
SN1-Tp-Uplk-Committed-Data-Rate	0	0	0-1	0	0	0
SN1-Tp-Uplk-Exceed-Action	0	0	0-1	0	0	0
SN1-Tp-Uplk-Peak-Data-Rate	0	0	0-1	0	0	0
SN1-Tp-Uplk-Violate-Action	0	0	0-1	0	0	0
SN1-Transparent-Data	0	0	0-1	0-1	0-1	0-1
SN1-Tun-Addr-Policy	0	0	0-1	0	0	0
SN1-Tunnel-Gn	0	0	0-1	1	1	1
SN1-Tunnel-ISAKMP-Crypto-Map	0	0	0-1	0	0	0
SN1-Tunnel-ISAKMP-Secret	0	0	0-1	0	0	0
SN1-Tunnel-Load-Balancing	0	0	0-1	0	0	0
SN1-Virtual-APN-Name	0-1	0	0-1	0-1	0-1	0-1
SN1-Visiting-Behavior	0	0	0-1	0	0	0
SN1-Visiting-Profile	0	0	0-1	0	0	0
SN1-Visiting-Sub-Use-GGSN	0	0	0-1	0	0	0
SN1-VPN-ID	0	0	0-1	0-1	0-1	0-1
SN1-VPN-Name	0	0	1	0-1	0-1	0-1
SN-Access-link-IP-Frag	0	0	0-1	0	0	0
SN-Acs-Credit-Control-Group	0	0	0-1	0-1	0-1	0-1
SN-Assigned-VLAN-ID	0	0	0-1	0-1	0-1	0-1

Attribute	GGSN Access-Request	GGSN Access-Reject	GGSN Access-Accept	GGSN Acct-Request-Start	GGSN Acct-Request-Interim	GGSN Acct-Request-Stop
SN-Bandwidth-Policy	0	0	1	0	0	0
SN-CBB-Policy	0	0	1	0	0	0
SN-CFPolicy-ID	0	0	0-1	0	0	0
SN-Data-Tunnel-Ignore-DF-Bit	0	0	0-1	0	0	0
SN-DHCP-Lease-Expiry-Policy	0	0	0-1	0	0	0
SN-Disconnect-Reason	0	0	0	0	0-1	0-1
SN-DNS-Proxy-Intercept-List	0	0	1	0	0	0
SN-DNS-Proxy-Use-Subscr-Addr	0	0	1	0	0	0
SN-Ecs-Data-Volume	0	0	0	0-1	0-1	0-1
SN-Enable-QoS-Renegotiation	0	0	0-1	0	0	0
SN-Ext-Inline-Srvr-Context	0	0	0-1	0	0	0
SN-Ext-Inline-Srvr-Down-Addr	0	0	0-1	0	0	0
SN-Ext-Inline-Srvr-Down-VLAN	0	0	0-1	0	0	0
SN-Ext-Inline-Srvr-Preference	0	0	0-1	0	0	0
SN-Ext-Inline-Srvr-Up-Addr	0	0	0-1	0	0	0
SN-Ext-Inline-Srvr-Up-VLAN	0	0	0-1	0	0	0
SN-Fast-Reauth-Username	0	0	0-1	0	0	0
SN-Firewall-Enabled	0	0	0	1	1	1
SN-Firewall-Policy	0	0	1	0	0	0
SN-GTP-Version	0-1	0	0	0-1	0-1	0-1
SN-Home-Behavior	0	0	0-1	0	0	0
SN-Home-Profile	0	0	0-1	0	0	0
SN-Home-Sub-Use-GGSN	0	0	0-1	0	0	0
SN-Inactivity-Time	0	0	0-1	0	0	0
SN-IP-Filter-In	0	0	0+	0	0	0
SN-IP-Filter-Out	0	0	0+	0	0	0
SN-IP-Hide-Service-Address	0	0	0-1	0	0	0
SN-IP-In-Plcy-Grp	0	0	0-1	0	0	0
SN-IP-Out-Plcy-Grp	0	0	0-1	0	0	0
SN-IP-Source-Validation	0	0	0-1	0	0	0
SN-IP-Source-Violate-No-Acct	0	0	0-1	0	0	0
SN-IPv6-DNS-Proxy	0	0	0-1	0	0	0
SN-IPv6-Egress-Filtering	0	0	0-1	0	0	0
SN-IPv6-Min-Link-MTU	0	0	0-1	0	0	0
SN-IPv6-num-rtr-advt	0	0	0-1	0	0	0
SN-IPv6-Primary-DNS	0	0	0-1	0	0	0
SN-IPv6-rtr-advt-interval	0	0	0-1	0	0	0
SN-IPv6-Secondary-DNS	0	0	0-1	0	0	0
SN-IPv6-Sec-Pool	0	0	0+	0	0	0
SN-IPv6-Sec-Prefix	0	0	0+	0	0	0
SN-L3-to-L2-Tun-Addr-Policy	0	0	0-1	0	0	0
SN-Local-IP-Address	0-1	0	0-1	1	1	1
SN-Long-Duration-Action	0	0	0-1	0	0	0
SN-Long-Duration-Notification	0	0	0-1	0	0	0
SN-Long-Duration-Timeout	0	0	0-1	0	0	0
SN-Mediation-Acct-Rsp-Action	0	0	0-1	1	1	1
SN-Mediation-Enabled	0	0	0-1	1	1	1

Attribute	GGSN Access-Request	GGSN Access-Reject	GGSN Access-Accept	GGSN Acct-Request-Start	GGSN Acct-Request-Interim	GGSN Acct-Request-Stop
SN-Mediation-No-Interims	0	0	0-1	1	1	1
SN-Mediation-VPN-Name	0	0	0-1	1	1	1
SN-Min-Compress-Size	0	0	0-1	0	0	0
SN-MIP-HA-Assignment-Table	0	0	1	0	0	0
SN-NPU-Qos-Priority	0	0	0-1	0	0	0
SN-Overload-Disc-Connect-Time	0	0	0-1	0	0	0
SN-Overload-Disc-Inact-Time	0	0	0-1	0	0	0
SN-Overload-Disconnect	0	0	0-1	0	0	0
SN-Permit-User-Mcast-PDUs	0	0	0-1	0	0	0
SN-PPP-Accept-Peer-v6Ifid	0	0	0-1	0	0	0
SN-PPP-Always-On-Vse	0	0	0-1	0	0	0
SN-PPP-Data-Compression	0	0	0-1	0-1	0-1	0-1
SN-PPP-Data-Compression-Mode	0	0	0-1	0-1	0-1	0-1
SN-PPP-Keepalive	0	0	0-1	0	0	0
SN-PPP-NW-Layer-IPv4	0	0	0-1	0	0	0
SN-PPP-NW-Layer-IPv6	0	0	0-1	0	0	0
SN-PPP-Outbound-Username	0	0	0-1	0	0	0
SN-PPP-Reneg-Disc	0	0	0-1	0	0	0
SN-Primary-DCCA-Peer	0	0	0-1	0-1	0-1	0-1
SN-Primary-DNS-Server	0	0	0-1	0	0	0
SN-Primary-NBNS-Server	0	0	0-1	0	0	0
SN-Pseudonym-Username	0	0	0-1	0	0	0
SN-QoS-Background-Class	0	0	0-1	0	0	0
SN-QoS-Conversation-Class	0	0	0-1	0	0	0
SN-QoS-Interactive1-Class	0	0	0-1	0	0	0
SN-QoS-Interactive2-Class	0	0	0-1	0	0	0
SN-QoS-Interactive3-Class	0	0	0-1	0	0	0
SN-QoS-Renegotiation-Timeout	0	0	0-1	0	0	0
SN-QoS-Streaming-Class	0	0	0-1	0	0	0
SN-QoS-Tp-Dnlk	0	0	0-1	0	0	0
SN-QoS-Tp-Uplk	0	0	0-1	0	0	0
SN-Radius-Returned-Username	0	0	0-1	0	0	0
SN-Re-CHAP-Interval	0	0	0-1	0	0	0
SN-Roaming-Behavior	0	0	0-1	0	0	0
SN-Roaming-Profile	0	0	0-1	0	0	0
SN-Roaming-Sub-Use-GGSN	0	0	0-1	0	0	0
SN-ROHC-Flow-Marking-Mode	0	0	0-1	0	0	0
SN-ROHC-Profile-Name	0	0	0-1	0	0	0
SN-Rulebase	0	0	0-1	1	1	1
SN-Secondary-DCCA-Peer	0	0	0-1	0	0	0
SN-Secondary-DNS-Server	0	0	0-1	0	0	0
SN-Secondary-NBNS-Server	0	0	0-1	0	0	0
SN-Subs-Acc-Flow-Traffic-Valid	0	0	0-1	0	0	0
SN-Subscriber-Accounting	0	0	0-1	1	1	1
SN-Subscriber-Acct-Interim	0	0	0-1	0	0	0
SN-Subscriber-Acct-Mode	0	0	0-1	0	0	0
SN-Subscriber-Acct-Rsp-Action	0	0	0-1	0	0	0

Attribute	GGSN Access-Request	GGSN Access-Reject	GGSN Access-Accept	GGSN Acct-Request-Start	GGSN Acct-Request-Interim	GGSN Acct-Request-Stop
SN-Subscriber-Acct-Start	0	0	0-1	0	0	0
SN-Subscriber-Acct-Stop	0	0	0-1	0	0	0
SN-Subscriber-Dormant-Activity	0	0	0-1	0	0	0
SN-Subscriber-IP-Hdr-Neg-Mode	0	0	0-1	0	0	0
SN-Subscriber-IP-TOS-Copy	0	0	0-1	0	0	0
SN-Subscriber-Nexthop-Address	0	0	0-1	1	1	1
SN-Subscriber-No-Interims	0	0	0-1	0	0	0
SN-Subscriber-Permission	0	0	0-1	0	0	0
SN-Subs-IMSA-Service-Name	0	0	0-1	0	0	0
SN-Subs-VJ-Slotid-Cmp-Neg-Mode	0	0	0-1	0	0	0
SN-Tp-Dnlk-Burst-Size	0	0	0-1	0	0	0
SN-Tp-Dnlk-Committed-Data-Rate	0	0	0-1	0	0	0
SN-Tp-Dnlk-Exceed-Action	0	0	0-1	0	0	0
SN-Tp-Dnlk-Peak-Data-Rate	0	0	0-1	0	0	0
SN-Tp-Dnlk-Violate-Action	0	0	0-1	0	0	0
SN-TPO-Policy	0	0	0-1	0	0	0
SN-Tp-Uplk-Burst-Size	0	0	0-1	0	0	0
SN-Tp-Uplk-Committed-Data-Rate	0	0	0-1	0	0	0
SN-Tp-Uplk-Exceed-Action	0	0	0-1	0	0	0
SN-Tp-Uplk-Peak-Data-Rate	0	0	0-1	0	0	0
SN-Tp-Uplk-Violate-Action	0	0	0-1	0	0	0
SN-Transparent-Data	0	0	0-1	0-1	0-1	0-1
SN-Tun-Addr-Policy	0	0	0-1	0	0	0
SN-Tunnel-Gn	0	0	0-1	1	1	1
SN-Tunnel-ISAKMP-Crypto-Map	0	0	0-1	0	0	0
SN-Tunnel-ISAKMP-Secret	0	0	0-1	0	0	0
SN-Tunnel-Load-Balancing	0	0	0-1	0	0	0
SN-Virtual-APN-Name	0-1	0	0-1	0-1	0-1	0-1
SN-Visiting-Behavior	0	0	0-1	0	0	0
SN-Visiting-Profile	0	0	0-1	0	0	0
SN-Visiting-Sub-Use-GGSN	0	0	0-1	0	0	0
SN-VPN-ID	0	0	0-1	0-1	0-1	0-1
SN-VPN-Name	0	0	1	0-1	0-1	0-1
State	1	0	0-1	0	0	0
Tunnel-Assignment-ID	0	0	0-1	1	1	1
Tunnel-Client-Auth-ID	0	0	0-1	1	1	1
Tunnel-Client-Endpoint	0	0	0-1	1	1	1
Tunnel-Medium-Type	0	0	0-1	1	1	1
Tunnel-Preference	0	0	0-1	0	0	0
Tunnel-Private-Group-ID	0	0	0-1	1	1	1
Tunnel-Server-Auth-ID	0	0	0-1	1	1	1
Tunnel-Server-Endpoint	0	0	0-1	1	1	1
Tunnel-Type	0	0	0-1	1	1	1
User-Name	1	0	0-1	0-1	0	0-1
User-Password	0-1	0	0	0	0	0
White-List	0	0	1	0	0	0
WiMAX-BS-ID	0	0	0	0-1	0-1	0-1

Attribute	GGSN Access-Request	GGSN Access-Reject	GGSN Access-Accept	GGSN Acct-Request-Start	GGSN Acct-Request-Interim	GGSN Acct-Request-Stop
WiMAX-Home-HNP-PMIP6	0+	0	0+	0+	0+	0+
WiMAX-Home-IPv4-HoA-PMIP6	0-1	0	1	0-1	0-1	0-1
WiMAX-Prepaid-Indicator	0	0	0	0-1	0-1	0-1

## WIMAX Attribute/Packet Table

Attribute	WIMAX Access-Request	WIMAX Access-Reject	WIMAX Access-Accept	WIMAX Acct-Request-Start	WIMAX Acct-Request-Interim	WIMAX Acct-Request-Stop
3GPP2-Active-Time	0	0	0	0	0-1	0-1
3GPP2-Beginning-Session	0	0	0	1	0	0
3GPP2-BSID	0-1	0	0	0-1	0-1	0-1
3GPP2-IP-QOS	0	0	0-1	0	0	0
3GPP2-IP-Technology	0	0	0	1	1	1
3GPP2-MIP-Sig-Octet-Count-In	0	0	0	0	0-1	0-1
3GPP2-MIP-Sig-Octet-Count-Out	0	0	0	0	0-1	0-1
3GPP2-MN-HA-Shared-Key	0	0	0-1	0	0	0
3GPP2-MN-HA-SPI	0	0	0-1	0	0	0
3GPP2-Session-Continue	0	0	0	0	0	1
AAA-Session-ID	0-1	0-1	1	0	0	0
Acct-Authentic	0	0	0	0-1	0-1	0-1
Acct-Input-Packets	0	0	0	0	0-1	0-1
Acct-Interim-Interval	0	0	0	0-1	0-1	0-1
Acct-Multi-Session-Id	0	0	0	1	1	1
Acct-Output-Packets	0	0	0	0	0-1	0-1
Acct-Session-Id	0	0	0	1	1	1
Calling-Station-Id	1	0	0	1	1	1
Class	0	0	0-1	0-1	0-1	0-1
Connect-Info	1	0	0-1	1	1	1
CUI	0-1	0	0-1	0-1	0-1	0-1
DHCPMSG-Server-IP	0	0	0-1	0	0	0
DHCP-RK	0	0	0-1	0	0	0
DHCP-RK-Key-ID	0	0	0-1	0	0	0
DHCP-RK-Lifetime	0	0	0-1	0	0	0
EAP-Message	1+	1+	1+	0	0	0
Error-Cause	0	0-1	0	0	0	0
Framed-Interface-Id	0	0	0	0-1	0-1	0-1
Framed-IP-Address	0	0	0-1	1	1	1
Framed-IP-Netmask	0	0	0	0-1	0-1	0-1
Framed-IPv6-Prefix	0	0	0	0-1	0-1	0-1
Framed-MTU	0-1	0	0	0	0	0
HA-IP-MIP4	0	0	0	1	1	1
HA-IP-MIP6	0	0	0	1	1	1
Hotline-Indicator	0	0	0-1	0-1	0-1	0-1
Hotline-Profile-ID	0	0	0-1	0	0	0
Hotline-Session-Timer	0	0	0-1	0	0	0
HTTP-Redirection-Rule	0	0	0+	0	0	0
IP-Redirection-Rule	0	0	0+	0	0	0
MSK	0	0	0-1	0	0	0
NAS-Port-Type	0	0	0	0-1	0-1	0-1
PMIP6-RK-KEY	0	0	0-1	0	0	0
PMIP6-RK-SPI	0	0	0-1	0	0	0

Attribute	WIMAX Access-Request	WIMAX Access-Reject	WIMAX Access-Accept	WIMAX Acct-Request-Start	WIMAX Acct-Request-Interim	WIMAX Acct-Request-Stop
PMIP6-Service-Info	0-1	0	0-1	0	0	0
Primary-DNS-Server	0	0	0	0-1	0-1	0-1
Reply-Message	0	0-1	0-1	0	0	0
Secondary-DNS-Server	0	0	0	0-1	0-1	0-1
Service-Type	0	0	0	0-1	0-1	0-1
Session-Timeout	0	0-1	0-1	0	0	0
SN1-Disconnect-Reason	0	0	0	0	0	1
SN1-Prepaid-Compressed-Count	0	0	0	0	0-1	0-1
SN1-Primary-DNS-Server	0	0	0	0-1	0-1	0-1
SN1-Proxy-MIP	0	0	0	0-1	0-1	0-1
SN1-Secondary-DNS-Server	0	0	0	0-1	0-1	0-1
SN1-Subscriber-Accounting	0	0	0	1	1	1
SN1-VPN-ID	0	0	0-1	0-1	0-1	0-1
SN1-VPN-Name	0	0	0-1	0-1	0-1	0-1
SN-DHCP-Options	0	0	0-1	0	0	0
SN-Disconnect-Reason	0	0	0	0	0	1
SN-Handoff-Indicator	0	0	0	0	0-1	0
SN-Prepaid-Compressed-Count	0	0	0	0	0-1	0-1
SN-Primary-DNS-Server	0	0	0	0-1	0-1	0-1
SN-Proxy-MIP	0	0	0	0-1	0-1	0-1
SN-Secondary-DNS-Server	0	0	0	0-1	0-1	0-1
SN-Subscriber-Accounting	0	0	0	1	1	1
SN-VPN-ID	0	0	0-1	0-1	0-1	0-1
SN-VPN-Name	0	0	0-1	0-1	0-1	0-1
SN-WiMAX-Auth-Only	0	0	0-1	0	0	0
State	0-1	0-1	0-1	0	0	0
User-Name	1	0	0-1	1	1	1
WiMAX-Active-Time	0	0	0	0	0-1	0-1
WiMAX-Beginning-Of-Session	0	0	0	1	0	0
WiMAX-BS-ID	0-1	0	0	0-1	0-1	0-1
WiMAX-Control-Octets-In	0	0	0	0	0-1	0-1
WiMAX-Control-Octets-Out	0	0	0	0	0-1	0-1
WiMAX-Control-Packets-In	0	0	0	0	0-1	0-1
WiMAX-Control-Packets-Out	0	0	0	0	0-1	0-1
WiMAX-Count-Type	0	0	0	0	0-1	0-1
WiMAX-Device-Auth-Indicator	0-1	0	0	0	0	0
WiMAX-Home-HNP-PMIP6	0	0	0	0-1	0-1	0-1
WiMAX-Home-IPv4-HoA-PMIP6	0	0	0-1	1	1	1
WiMAX-Idle-Mode-Transition	0	0	0	0	0-1	0
WiMAX-IP-Technology	0	0	0	1	1	1
WiMAX-NAP-ID	0-1	0	0	0-1	0-1	0-1
WiMAX-NSP-ID	0-1	0	0	0-1	0-1	0-1
WiMAX-Packet-Flow-Descriptor	0	0	0+	0	0	0
WiMAX-Packet-Flow-Descriptor-V2	0	0	0+	0	0	0
WiMAX-PDF-ID	0	0	1	0-1	0-1	0-1
WiMAX-Prepaid-Indicator	0	0	0	0-1	0-1	0-1
WiMAX-QoS-Descriptor	0	0	0+	0	0	0

Attribute	WIMAX Access-Request	WIMAX Access-Reject	WIMAX Access-Accept	WIMAX Acct-Request-Start	WIMAX Acct-Request-Interim	WIMAX Acct-Request-Stop
WiMAX-SDF-ID	0	0	0-1	0-1	0-1	0-1
WiMAX-Session-Continue	0	0	0	0	0	1

**CSCF Attribute/Packet Table**

Attribute	CSCF Access-Request	CSCF Access-Reject	CSCF Access-Accept	CSCF Acct-Request-Start	CSCF Acct-Request-Interim	CSCF Acct-Request-Stop
Acct-Interim-Interval	0	0	0	0-1	0-1	0-1
Called-Station-ID	0	0	0	1	1	1
Digest-AKA-Auts	0-1	0	0	0	0	0
Digest-Algorithm	0-1	0	0-1	0	0	0
Digest-Auth-Param	0+	0	0+	0	0	0
Digest-CNonce	0-1	0	0	0	0	0
Digest-Domain	0	0	0+	0	0	0
Digest-Entity-Body-Hash	0-1	0	0	0	0	0
Digest-HA1	0	0	0-1	0	0	0
Digest-Method	0-1	0	0	0	0	0
Digest-Nexnonce	0-1	0	0-1	0	0	0
Digest-Nonce	0-1	0	0-1	0	0	0
Digest-Nonce-Count	0-1	0	0	0	0	0
Digest-Opaque	0-1	0	0-1	0	0	0
Digest-Qop	0-1	0	0+	0	0	0
Digest-Realm	0-1	0	0-1	0	0	0
Digest-Response	0-1	0	0-1	0	0	0
Digest-Response-Auth	0-1	0	0-1	0	0	0
Digest-Stale	0	0	0-1	0	0	0
Digest-URI	0-1	0	0-1	0	0	0
Digest-Username	0-1	0	0	0	0	0
Framed-Interface-Id	0-1	0	0-1	0	0	0
Framed-IP-Address	0-1	0	0-1	0	0	0
Framed-IPv6-Prefix	0-1	0	0-1	0	0	0
NAS-Port-Type	1	0	0	1	1	1
SIP-AOR	0-1	0	0	0	0	0
SN-Cause-Code	0	0	0	0	0	0-1
SN-CF-Call-International	0	0	0-1	0	0	0
SN-CF-Call-Local	0	0	0-1	0	0	0
SN-CF-Call-LongDistance	0	0	0-1	0	0	0
SN-CF-Call-Premium	0	0	0-1	0	0	0
SN-CF-Call-RoamingInternatl	0	0	0-1	0	0	0
SN-CF-Call-Transfer	0	0	0-1	0	0	0
SN-CF-Call-Waiting	0	0	0-1	0	0	0
SN-CF-Cld-Display	0	0	0-1	0	0	0
SN-CF-Cld-Display-Blocked	0	0	0-1	0	0	0
SN-CF-Follow-Me	0	0	0+	0	0	0
SN-CF-Forward-Busy-Line	0	0	0-1	0	0	0
SN-CF-Forward-No-Answer	0	0	0-1	0	0	0
SN-CF-Forward-Not-Regd	0	0	0-1	0	0	0
SN-CF-Forward-Unconditional	0	0	0-1	0	0	0
SN-Content-Disposition	0	0	0	0-1	0-1	0-1
SN-Content-Length	0	0	0	0-1	0-1	0-1

Attribute	CSCF Access-Request	CSCF Access-Reject	CSCF Access-Accept	CSCF Acct-Request-Start	CSCF Acct-Request-Interim	CSCF Acct-Request-Stop
SN-Content-Type	0	0	0	0-1	0-1	0-1
SN-CR-International-Cid	0	0	0-1	0	0	0
SN-CR-LongDistance-Cid	0	0	0-1	0	0	0
SN-Cscf-Subscriber-Ip-Address	0	0	0-1	0	0	0
SN-Event	0	0	0	0-1	0-1	0-1
SN-GGSN-Address	0	0	0	0-1	0-1	0
SN-IMS-Charging-Identifier	0	0	0	0-1	0-1	0-1
SN-ISC-Template-Name	0	0	0-1	0	0	0
SN-Is-Unregistered-Subscriber	0	0	0	0-1	0-1	0-1
SN-Node-Functionality	0	0	0	0-1	0-1	0-1
SN-Originating-IOI	0	0	0	0-1	0-1	0-1
SN-Role-Of-Node	0	0	0	0-1	0-1	0-1
SN-SDP-Session-Description	0	0	0	0-1	0-1	0
SN-Session-Id	0	0	0	0-1	0-1	0-1
SN-SIP-Method	0	0	0	0-1	0-1	0-1
SN-SIP-Request-Time-Stamp	0	0	0	0-1	0-1	0-1
SN-SIP-Response-Time-Stamp	0	0	0	0-1	0-1	0-1
SN-Terminating-IOI	0	0	0	0-1	0-1	0-1
State	0-1	0	0-1	0	0	0
User-Name	1	0	0	1	1	1
WiMAX-Home-HNP-PMIP6	0-1	0	0-1	0	0	0
WiMAX-Home-IPv4-HoA-PMIP6	0-1	0	0-1	0	0	0

**MIPv6HA Attribute/Packet Table**

Attribute	MIPv6HA Access-Request	MIPv6HA Access-Reject	MIPv6HA Access-Accept	MIPv6HA Acct-Request-Start	MIPv6HA Acct-Request-Interim	MIPv6HA Acct-Request-Stop
3GPP2-Beginning-Session	0	0	0	0-1	0	0
3GPP2-BSID	0	0	0	0-1	0-1	0-1
3GPP2-Comp-Tunnel-Indicator	0	0	0	1	1	1
3GPP2-Correlation-Id	1	0	0	1	1	1
3GPP2-DNS-Server-IPv6-Addr	0	0	0-1	0	0	0
3GPP2-DNS-Update-Required	0	0	0-1	0	0	0
3GPP2-ESN	1	0	0	0-1	0-1	0-1
3GPP2-IP-QOS	0	0	0-1	1	1	1
3GPP2-IP-Technology	0-1	0	0-1	0	0	0
3GPP2-MEID	0	0	0-1	0-1	0-1	0-1
3GPP2-MIP6-Authenticator	0-1	0	0	0	0	0
3GPP2-MIP6-CoA	0-1	0	0	0-1	0-1	0
3GPP2-MIP6-HA	0-1	0	0	0	0	0
3GPP2-MIP6-HoA	0-1	0	0	0-1	0-1	0
3GPP2-MIP6-HoA-Not-Authorized	0	0	0-1	0	0	0
3GPP2-MIP6-MAC-Mobility-Data	0-1	0	0	0	0	0
3GPP2-MIP6-Mesg-ID	0-1	0	0	0	0	0
3GPP2-MIP6-Session-Key	0	0	0-1	0	0	0
3GPP2-MN-HA-Shared-Key	0	0	0-1	0	0	0
3GPP2-MN-HA-SPI	0-1	0	0	0	0	0
3GPP2-Mobile-Term-Orig-Ind	0	0	0	1	1	1
3GPP2-PMIP-IPv4Session-Info	0-1	0	0-1	0-1	0-1	0-1
3GPP2-PMIP-IPv6Session-Info	0-1	0	0-1	0-1	0-1	0-1
3GPP2-PMIP-NAI	0-1	0	0-1	0-1	0-1	0-1
3GPP2-Service-Option	0	0	0	0-1	0-1	0-1
3GPP2-Serving-PCF	0	0	0	1	1	1
AAA-Session-ID	0-1	0	1	0	0	0
Acct-Authentic	0	0	0	1	1	1
Acct-Input-Packets	0-1	0	0	0	1	1
Acct-Interim-Interval	0	0	0-1	0	0	0
Acct-Multi-Session-Id	0	0	0	0-1	0-1	0-1
Acct-Output-Packets	0-1	0	0	0	1	1
Acct-Session-Id	0	0	0	1	1	1
BU-CoA-Ipv6	0-1	0	0	0	0	0
Called-Station-ID	0	0	0	1	1	1
Calling-Station-Id	1	0	1	1	1	1
CHAP-Challenge	1	0	0	0	0	0
Class	0	0	0-1	0-1	0-1	0-1
CUI	0-1	0	0-1	0	0	0
Error-Cause	0	0-1	0	0	0	0
Framed-Interface-Id	0	0	0	0-1	0-1	0-1
Framed-IPv6-Pool	0	0	0-1	0	0	0
Framed-IPv6-Prefix	0	0	0	0+	0+	0+

Attribute	MIPv6HA Access-Request	MIPv6HA Access-Reject	MIPv6HA Access-Accept	MIPv6HA Acct-Request-Start	MIPv6HA Acct-Request-Interim	MIPv6HA Acct-Request-Stop
Framed-MTU	0	0	0-1	0-1	0-1	0-1
Framed-Pool	0	0	0+	0	0	0
HA-IP-MIP4	1	0	0	1	1	1
HA-IP-MIP6	1	0	0	1	1	1
HA-RK-KEY	0	0	0-1	0	0	0
HA-RK-Lifetime	0	0	0-1	0	0	0
HA-RK-SPI	0-1	0	0-1	0	0	0
hLMA-IPv6-PMIP6	0-1	0	0	0	0	0
Idle-Timeout	0	0	0-1	0	0	0
MN-HA-MIP4-KEY	0	0	1	0	0	0
MN-HA-MIP4-SPI	1	0	1	0	0	0
MN-HA-MIP6-KEY	0	0	0-1	0	0	0
MN-HA-MIP6-SPI	0	0	0-1	0	0	0
NAS-Port	1	0	0	1	1	1
NAS-Port-Type	1	0	0	1	1	1
PMIP6-RK-KEY	0	0	0-1	0	0	0
PMIP6-RK-SPI	0-1	0	0	0	0	0
Reply-Message	0	0-1	0-1	0	0	0
RRQ-HA-IP	0-1	0	0	0	0	0
RRQ-MN-HA-KEY	0	0	0-1	0	0	0
Service-Type	1	0	0-1	1	1	1
Session-Timeout	0	0	0-1	0	0	0
SN1-Access-link-IP-Frag	0	0	0-1	0	0	0
SN1-Admin-Permission	0	0	0-1	0	0	0
SN1-Assigned-VLAN-ID	0	0	0-1	0-1	0-1	0-1
SN1-CPolicy-ID	0	0	0-1	0	0	0
SN1-Data-Tunnel-Ignore-DF-Bit	0	0	0-1	0	0	0
SN1-DHCP-Lease-Expiry-Policy	0	0	0-1	0	0	0
SN1-Disconnect-Reason	0	0	0	0	0	1
SN1-DNS-Proxy-Intercept-List	0	0	1	0	0	0
SN1-Enable-QoS-Renegotiation	0	0	0-1	0	0	0
SN1-Ext-Inline-Srvr-Context	0	0	0-1	0	0	0
SN1-Ext-Inline-Srvr-Down-Addr	0	0	0-1	0	0	0
SN1-Ext-Inline-Srvr-Down-VLAN	0	0	0-1	0	0	0
SN1-Ext-Inline-Srvr-Preference	0	0	0-1	0	0	0
SN1-Ext-Inline-Srvr-Up-Addr	0	0	0-1	0	0	0
SN1-Ext-Inline-Srvr-Up-VLAN	0	0	0-1	0	0	0
SN1-Firewall-Enabled	0	0	0	1	1	1
SN1-FMC-Location	0	0	0	0-1	0-1	0-1
SN1-Gratuitous-ARP-Aggressive	0	0	0-1	0	0	0
SN1-Ignore-Unknown-HA-Addr-Err	0	0	0-1	0	0	0
SN1-IMS-AM-Address	0	0	0-1	0	0	0
SN1-IMS-AM-Domain-Name	0	0	0-1	0	0	0
SN1-Inactivity-Time	0	0	0-1	0	0	0
SN1-IP-Filter-In	0	0	0+	0	0	0
SN1-IP-Filter-Out	0	0	0+	0	0	0
SN1-IP-Hide-Service-Address	0	0	0-1	0	0	0

Attribute	MIPv6HA Access-Request	MIPv6HA Access-Reject	MIPv6HA Access-Accept	MIPv6HA Acct-Request-Start	MIPv6HA Acct-Request-Interim	MIPv6HA Acct-Request-Stop
SN1-IP-Pool-Name	0	0	0+	0	0	0
SN1-IP-Source-Validation	0	0	0-1	0	0	0
SN1-IP-Source-Violate-No-Acct	0	0	0-1	0	0	0
SN1-IPv6-Primary-DNS	0	0	0-1	0	0	0
SN1-IPv6-Secondary-DNS	0	0	0-1	0	0	0
SN1-IPv6-Sec-Pool	0	0	0+	0	0	0
SN1-IPv6-Sec-Prefix	0	0	0+	0	0	0
SN1-L3-to-L2-Tun-Addr-Policy	0	0	0-1	0	0	0
SN1-Local-IP-Address	0-1	0	0-1	1	1	1
SN1-Long-Duration-Action	0	0	0-1	0	0	0
SN1-Long-Duration-Notification	0	0	0-1	0	0	0
SN1-Long-Duration-Timeout	0	0	0-1	0	0	0
SN1-Mediation-Enabled	0	0	0-1	1	1	1
SN1-Mediation-VPN-Name	0	0	0-1	1	1	1
SN1-MIP-ANCID	0	0	0	0-1	0-1	0-1
SN1-MIP-Dual-Anchor	0	0	0-1	0	0	0
SN1-MIP-HA-Assignment-Table	0	0	1	0	0	0
SN1-MIP-Reg-Lifetime-Realm	0	0	0-1	0	0	0
SN1-MN-HA-Timestamp-Tolerance	0	0	0-1	0	0	0
SN1-NPU-Qos-Priority	0	0	0-1	0	0	0
SN1-Nw-Reachability-Server-Name	0	0	0-1	0	0	0
SN1-Overload-Disc-Connect-Time	0	0	0-1	0	0	0
SN1-Overload-Disc-Inact-Time	0	0	0-1	0	0	0
SN1-Overload-Disconnect	0	0	0-1	0	0	0
SN1-PDSN-Correlation-Id	0	0	0	0-1	0-1	0-1
SN1-PDSN-NAS-Id	0	0	0	0-1	0-1	0-1
SN1-PDSN-NAS-IP-Address	0	0	0	0-1	0-1	0-1
SN1-Permit-User-Mcast-PDUs	0	0	0-1	0	0	0
SN1-Prepaid	0	0	0-1	0	0	0
SN1-Prepaid-Compressed-Count	0-1	0	0-1	0	0	0
SN1-Prepaid-Final-Duration-Alg	0	0	0-1	0	0	0
SN1-Prepaid-Inbound-Octets	0-1	0	0-1	0	0	0
SN1-Prepaid-Outbound-Octets	0-1	0	0-1	0	0	0
SN1-Prepaid-Preference	0	0	0-1	0	0	0
SN1-Prepaid-Timeout	0-1	0	0-1	0	0	0
SN1-Prepaid-Total-Octets	0-1	0	0-1	0	0	0
SN1-Prepaid-Watermark	0-1	0	0-1	0	0	0
SN1-Primary-DCCA-Peer	0	0	0-1	0	0	0
SN1-QoS-Background-Class	0	0	0-1	0	0	0
SN1-QoS-Conversation-Class	0	0	0-1	0	0	0
SN1-QoS-Interactive1-Class	0	0	0-1	0	0	0
SN1-QoS-Interactive2-Class	0	0	0-1	0	0	0
SN1-QoS-Interactive3-Class	0	0	0-1	0	0	0
SN1-QoS-Renegotiation-Timeout	0	0	0-1	0	0	0
SN1-QoS-Streaming-Class	0	0	0-1	0	0	0
SN1-QoS-Tp-Dnlk	0	0	0-1	0	0	0
SN1-QoS-Tp-Uplk	0	0	0-1	0	0	0

Attribute	MIPv6HA Access-Request	MIPv6HA Access-Reject	MIPv6HA Access-Accept	MIPv6HA Acct-Request-Start	MIPv6HA Acct-Request-Interim	MIPv6HA Acct-Request-Stop
SN1-Re-CHAP-Interval	0	0	0-1	0-1	0-1	0-1
SN1-Rulebase	0	0	0-1	1	1	1
SN1-Secondary-DCCA-Peer	0	0	0-1	0	0	0
SN1-Subscriber-Accounting	0	0	0-1	1	1	1
SN1-Subscriber-Acct-Interim	0	0	0-1	0	0	0
SN1-Subscriber-Acct-Mode	0	0	0-1	0	0	0
SN1-Subscriber-Acct-Rsp-Action	0	0	0-1	0	0	0
SN1-Subscriber-Acct-Start	0	0	0-1	0	0	0
SN1-Subscriber-Acct-Stop	0	0	0-1	0	0	0
SN1-Subscriber-Class	0	0	0-1	0-1	0-1	0-1
SN1-Subscriber-IP-TOS-Copy	0	0	0-1	0	0	0
SN1-Subscriber-Nexthop-Address	0	0	0-1	1	1	1
SN1-Subscriber-No-Interims	0	0	0-1	0	0	0
SN1-Subscriber-Permission	0	0	0-1	0	0	0
SN1-Subs-IMSA-Service-Name	0	0	0-1	0	0	0
SN1-Tp-Dnlk-Burst-Size	0	0	0-1	0	0	0
SN1-Tp-Dnlk-Committed-Data-Rate	0	0	0-1	0	0	0
SN1-Tp-Dnlk-Exceed-Action	0	0	0-1	0	0	0
SN1-Tp-Dnlk-Peak-Data-Rate	0	0	0-1	0	0	0
SN1-Tp-Dnlk-Violate-Action	0	0	0-1	0	0	0
SN1-Tp-Uplk-Burst-Size	0	0	0-1	0	0	0
SN1-Tp-Uplk-Committed-Data-Rate	0	0	0-1	0	0	0
SN1-Tp-Uplk-Exceed-Action	0	0	0-1	0	0	0
SN1-Tp-Uplk-Peak-Data-Rate	0	0	0-1	0	0	0
SN1-Tp-Uplk-Violate-Action	0	0	0-1	0	0	0
SN1-Tun-Addr-Policy	0	0	0-1	0	0	0
SN1-Tunnel-ISAKMP-Crypto-Map	0	0	0-1	0	0	0
SN1-Tunnel-ISAKMP-Secret	0	0	0-1	0	0	0
SN1-Tunnel-Load-Balancing	0	0	0-1	0	0	0
SN1-Unclassify-List-Name	0	0	0-1	0	0	0
SN1-Voice-Push-List-Name	0	0	0-1	0	0	0
SN1-VPN-ID	0	0	0-1	0-1	0-1	0-1
SN1-VPN-Name	0	0	1	0-1	0-1	0-1
SN-Access-link-IP-Frag	0	0	0-1	0	0	0
SN-Acs-Credit-Control-Group	0	0	0-1	0-1	0-1	0-1
SN-Admin-Permission	0	0	0-1	0	0	0
SN-Assigned-VLAN-ID	0	0	0-1	0-1	0-1	0-1
SN-Bandwidth-Policy	0	0	1	0	0	0
SN-CBB-Policy	0	0	1	0	0	0
SN-CFPolicy-ID	0	0	0-1	0	0	0
SN-Data-Tunnel-Ignore-DF-Bit	0	0	0-1	0	0	0
SN-DHCP-Lease-Expiry-Policy	0	0	0-1	0	0	0
SN-Disconnect-Reason	0	0	0	0	0	1
SN-DNS-Proxy-Intercept-List	0	0	1	0	0	0
SN-Enable-QoS-Renegotiation	0	0	0-1	0	0	0
SN-Ext-Inline-Srvr-Context	0	0	0-1	0	0	0
SN-Ext-Inline-Srvr-Down-Addr	0	0	0-1	0	0	0

Attribute	MIPv6HA Access-Request	MIPv6HA Access-Reject	MIPv6HA Access-Accept	MIPv6HA Acct-Request-Start	MIPv6HA Acct-Request-Interim	MIPv6HA Acct-Request-Stop
SN-Ext-Inline-Srvr-Down-VLAN	0	0	0-1	0	0	0
SN-Ext-Inline-Srvr-Preference	0	0	0-1	0	0	0
SN-Ext-Inline-Srvr-Up-Addr	0	0	0-1	0	0	0
SN-Ext-Inline-Srvr-Up-VLAN	0	0	0-1	0	0	0
SN-Firewall-Enabled	0	0	0	1	1	1
SN-Firewall-Policy	0	0	1	0	0	0
SN-FMC-Location	0	0	0	0-1	0-1	0-1
SN-Gratuitous-ARP-Aggressive	0	0	0-1	0	0	0
SN-Ignore-Unknown-HA-Addr-Error	0	0	0-1	0	0	0
SN-IMS-AM-Address	0	0	0-1	0	0	0
SN-IMS-AM-Domain-Name	0	0	0-1	0	0	0
SN-Inactivity-Time	0	0	0-1	0	0	0
SN-IP-Filter-In	0	0	0+	0	0	0
SN-IP-Filter-Out	0	0	0+	0	0	0
SN-IP-Hide-Service-Address	0	0	0-1	0	0	0
SN-IP-Pool-Name	0	0	0+	0	0	0
SN-IP-Source-Validation	0	0	0-1	0	0	0
SN-IP-Source-Violate-No-Acct	0	0	0-1	0	0	0
SN-IPv6-Primary-DNS	0	0	0-1	0	0	0
SN-IPv6-Secondary-DNS	0	0	0-1	0	0	0
SN-IPv6-Sec-Pool	0	0	0+	0	0	0
SN-IPv6-Sec-Prefix	0	0	0+	0	0	0
SN-L3-to-L2-Tun-Addr-Policy	0	0	0-1	0	0	0
SN-Local-IP-Address	0-1	0	0-1	1	1	1
SN-Long-Duration-Action	0	0	0-1	0	0	0
SN-Long-Duration-Notification	0	0	0-1	0	0	0
SN-Long-Duration-Timeout	0	0	0-1	0	0	0
SN-Mediation-Enabled	0	0	0-1	1	1	1
SN-Mediation-VPN-Name	0	0	0-1	1	1	1
SN-MIP-ANCID	0	0	0	0-1	0-1	0-1
SN-MIP-Dual-Anchor	0	0	0-1	0	0	0
SN-MIP-HA-Assignment-Table	0	0	1	0	0	0
SN-MIP-Reg-Lifetime-Realm	0	0	0-1	0	0	0
SN-MN-HA-Timestamp-Tolerance	0	0	0-1	0	0	0
SN-NPU-Qos-Priority	0	0	0-1	0	0	0
SN-Nw-Reachability-Server-Name	0	0	0-1	0	0	0
SN-Overload-Disc-Connect-Time	0	0	0-1	0	0	0
SN-Overload-Disc-Inact-Time	0	0	0-1	0	0	0
SN-Overload-Disconnect	0	0	0-1	0	0	0
SN-PDSN-Correlation-Id	0	0	0	0-1	0-1	0-1
SN-PDSN-NAS-Id	0	0	0	0-1	0-1	0-1
SN-PDSN-NAS-IP-Address	0	0	0	0-1	0-1	0-1
SN-Permit-User-Mcast-PDUs	0	0	0-1	0	0	0
SN-Prepaid	0	0	0-1	0	0	0
SN-Prepaid-Compressed-Count	0-1	0	0-1	0	0	0
SN-Prepaid-Final-Duration-Alg	0	0	0-1	0	0	0
SN-Prepaid-Inbound-Octets	0-1	0	0-1	0	0	0

Attribute	MIPv6HA Access-Request	MIPv6HA Access-Reject	MIPv6HA Access-Accept	MIPv6HA Acct-Request-Start	MIPv6HA Acct-Request-Interim	MIPv6HA Acct-Request-Stop
SN-Prepaid-Outbound-Octets	0-1	0	0-1	0	0	0
SN-Prepaid-Preference	0	0	0-1	0	0	0
SN-Prepaid-Timeout	0-1	0	0-1	0	0	0
SN-Prepaid-Total-Octets	0-1	0	0-1	0	0	0
SN-Prepaid-Watermark	0-1	0	0-1	0	0	0
SN-Primary-DCCA-Peer	0	0	0-1	0	0	0
SN-QoS-Background-Class	0	0	0-1	0	0	0
SN-QoS-Conversation-Class	0	0	0-1	0	0	0
SN-QoS-Interactive1-Class	0	0	0-1	0	0	0
SN-QoS-Interactive2-Class	0	0	0-1	0	0	0
SN-QoS-Interactive3-Class	0	0	0-1	0	0	0
SN-QoS-Renegotiation-Timeout	0	0	0-1	0	0	0
SN-QoS-Streaming-Class	0	0	0-1	0	0	0
SN-QoS-Tp-Dnlk	0	0	0-1	0	0	0
SN-QoS-Tp-Uplk	0	0	0-1	0	0	0
SN-Re-CHAP-Interval	0	0	0-1	0-1	0-1	0-1
SN-Rulebase	0	0	0-1	1	1	1
SN-Secondary-DCCA-Peer	0	0	0-1	0	0	0
SN-Subscriber-Accounting	0	0	0-1	1	1	1
SN-Subscriber-Acct-Interim	0	0	0-1	0	0	0
SN-Subscriber-Acct-Mode	0	0	0-1	0	0	0
SN-Subscriber-Acct-Rsp-Action	0	0	0-1	0	0	0
SN-Subscriber-Acct-Start	0	0	0-1	0	0	0
SN-Subscriber-Acct-Stop	0	0	0-1	0	0	0
SN-Subscriber-Class	0	0	0-1	0-1	0-1	0-1
SN-Subscriber-IP-TOS-Copy	0	0	0-1	0	0	0
SN-Subscriber-Nexthop-Address	0	0	0-1	1	1	1
SN-Subscriber-No-Interims	0	0	0-1	0	0	0
SN-Subscriber-Permission	0	0	0-1	0	0	0
SN-Subs-IMSA-Service-Name	0	0	0-1	0	0	0
SN-Tp-Dnlk-Burst-Size	0	0	0-1	0	0	0
SN-Tp-Dnlk-Committed-Data-Rate	0	0	0-1	0	0	0
SN-Tp-Dnlk-Exceed-Action	0	0	0-1	0	0	0
SN-Tp-Dnlk-Peak-Data-Rate	0	0	0-1	0	0	0
SN-Tp-Dnlk-Violate-Action	0	0	0-1	0	0	0
SN-TPO-Policy	0	0	0-1	0	0	0
SN-Tp-Uplk-Burst-Size	0	0	0-1	0	0	0
SN-Tp-Uplk-Committed-Data-Rate	0	0	0-1	0	0	0
SN-Tp-Uplk-Exceed-Action	0	0	0-1	0	0	0
SN-Tp-Uplk-Peak-Data-Rate	0	0	0-1	0	0	0
SN-Tp-Uplk-Violate-Action	0	0	0-1	0	0	0
SN-TrafficSelector-Class	0	0	0-1	0	0	0
SN-Tun-Addr-Policy	0	0	0-1	0	0	0
SN-Tunnel-ISAKMP-Crypto-Map	0	0	0-1	0	0	0
SN-Tunnel-ISAKMP-Secret	0	0	0-1	0	0	0
SN-Tunnel-Load-Balancing	0	0	0-1	0	0	0
SN-Unclassify-List-Name	0	0	0-1	0	0	0

Attribute	MIPv6HA Access-Request	MIPv6HA Access-Reject	MIPv6HA Access-Accept	MIPv6HA Acct-Request-Start	MIPv6HA Acct-Request-Interim	MIPv6HA Acct-Request-Stop
SN-Voice-Push-List-Name	0	0	0-1	0	0	0
SN-VPN-ID	0	0	0-1	0-1	0-1	0-1
SN-VPN-Name	0	0	1	0-1	0-1	0-1
State	1	0	0-1	0	0	0
Tunnel-Assignment-ID	0	0	0-1	1	1	1
Tunnel-Client-Auth-ID	0	0	0-1	1	1	1
Tunnel-Client-Endpoint	0	0	0-1	1	1	1
Tunnel-Medium-Type	0	0	0-1	1	1	1
Tunnel-Preference	0	0	0-1	0	0	0
Tunnel-Private-Group-ID	0	0	0-1	1	1	1
Tunnel-Server-Auth-ID	0	0	0-1	1	1	1
Tunnel-Server-Endpoint	0	0	0-1	1	1	1
Tunnel-Type	0	0	0-1	1	1	1
User-Name	1	0	0-1	1	1	1
WiMAX-Beginning-Of-Session	0	0	0	0-1	0	0
WiMAX-BS-ID	0	0	0	0-1	0-1	0-1
WiMAX-Count-Type	0-1	0	0-1	0	0	0
WiMAX-Home-HNP-PMIP6	0	0	0	0+	0+	0+
WiMAX-IP-Technology	0-1	0	0-1	0	0	0
WiMAX-Prepaid-Indicator	0	0	0	0-1	0-1	0-1

## Dictionary Quick Reference

Attribute	standard	3gpp	3gpp2	3gpp2-835	starent	starent-835	starent-vsa1	starent-vsa1-835
3GPP2-835-Release-Indicator	No	No	No	Yes	No	Yes	No	Yes
3GPP2-Acct-Session-Time	No	No	No	Yes	No	Yes	No	Yes
3GPP2-Active-Time	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Active-Time-Corrected	No	No	No	No	No	No	No	No
3GPP2-Airlink-Record-Type	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Airlink-Sequence-Number	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Air-QOS	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Allowed-Diffserv	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Allowed-Persistent-TFTs	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Alternate-Billing-ID	No	No	No	Yes	No	Yes	No	Yes
3GPP2-Always-On	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Auth-Flow-Profile-Id	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Bad-PPP-Frame-Count	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-BCMCS-Auth-Parameters	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-BCMCS-BSN-Session-Info	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-BCMCS-Capability	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-BCMCS-Common-Session-Info	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-BCMCS-Flow-ID	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-BCMCS-Flow-Transmit-Time	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-BCMCS-Mcast-IP-Addr	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-BCMCS-Mcast-Port	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-BCMCS-Reason-Code	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-BCMCS-RN-Session-Info	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Beginning-Session	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-BSID	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Carrier-ID	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Comp-Tunnel-Indicator	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Container	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Correlation-Id	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Correlation-Id-Long	No	No	No	No	No	No	No	No
3GPP2-Correlation-Id-Old	No	No	No	No	No	No	No	No
3GPP2-DCCH-Frame-Size	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Diff-Service-Class-Option	No	No	No	No	No	No	No	No
3GPP2-Disconnect-Reason	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-DNS-Server-IP-Address	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-DNS-Server-IPV6-Addr	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-DNS-Update-Required	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-ESN	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-FA-Address	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-FEID	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Flow-Id	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Flow-Status	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Forward-Fundamental-Rate	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Forward-Fundamental-RC	No	No	Yes	Yes	Yes	Yes	Yes	Yes

Attribute	standard	3gpp	3gpp2	3gpp2-835	starent	starent-835	starent-vsa1	starent-vsa1-835
3GPP2-Forward-Mux-Option	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Forward-Traffic-Type	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Fundamental-Frame-Size	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Fwd-Dcch-Mux-Option	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Fwd-Dcch-Rc	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Fwd-Pdch-Rc	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-GMT-Timezone-Offset	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Granted-QoS	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-IKE-Secret	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-IKE-Secret-Request	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-IKE-Secret-Unencrypted	No	No	No	No	No	No	No	No
3GPP2-IMSI	No	No	No	No	No	No	No	No
3GPP2-Interconnect-IP	No	No	No	Yes	No	Yes	No	Yes
3GPP2-Interconnect-QOS	No	No	No	Yes	No	Yes	No	Yes
3GPP2-Inter-User-Priority	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-IP-QOS	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-IP-Services-Authorized	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-IP-TechNology	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-KeyID	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Last-Activity	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Max-Auth-Aggr-Bw-BET	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Max-Per-Fi-Pri-ForTheUser	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-MEID	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-MIP6-Authenticator	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-MIP6-CoA	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-MIP6-HA	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-MIP6-HoA	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-MIP6-HoA-Not-Authorized	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-MIP6-Home-Address	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-MIP6-Home-Agent	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-MIP6-Home-Link-Prefix	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-MIP6-MAC-Mobility-Data	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-MIP6-Mesg-ID	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-MIP6-Session-Key	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-MIP-HA-Address	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-MIP-Lifetime	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-MIP-Rev-Tunnel-Required	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-MIP-Sig-Octet-Count-In	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-MIP-Sig-Octet-Count-Out	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-MN-AAA-Removal-Indication	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-MN-HA-Shared-Key	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-MN-HA-Shared-Key-No-Enc	No	No	No	No	No	No	No	No
3GPP2-MN-HA-SPI	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Mobile-Term-Orig-Ind	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Number-Active-Transitions	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Num-Bytes-Received-Total	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Num-SDB-Input	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Num-SDB-Output	No	No	Yes	Yes	Yes	Yes	Yes	Yes

Attribute	standard	3gpp	3gpp2	3gpp2-835	starent	starent-835	starent-vsa1	starent-vsa1-835
3GPP2-PMIP-Capability	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-PMIP-IPv4Session-Info	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-PMIP-IPv6Session-Info	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-PMIP-NAI	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Pre-Paid-Accounting-Quota	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Pre-Paid-Acct-Capability	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Pre-Paid-TariffSwitch	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-QoS-Service-Opt-Profile	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Release-Indicator	No	No	Yes	No	Yes	No	Yes	No
3GPP2-Release-Indicator-custom9	No	No	No	No	No	No	No	No
3GPP2-Release-Indicator-Old	No	No	No	No	No	No	No	No
3GPP2-Release-Indicator-Prepaid	No	No	No	No	Yes	No	Yes	No
3GPP2-Remote-Addr-Table-Idx-Old	No	No	No	Yes	No	Yes	No	Yes
3GPP2-Remote-Addr-Table-Index	No	No	Yes	No	Yes	No	Yes	No
3GPP2-Remote-IPv4-Address	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Remote-IPv4-Addr-Octets	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Rev-Dcch-Mux-Option	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Rev-Dcch-Rc	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Reverse-Fundamental-Rate	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Reverse-Fundamental-RC	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Reverse-Mux-Option	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Reverse-Traffic-Type	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Rev-Pdch-Rc	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-RP-Session-ID	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Rsvp-Signal-In-Count	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Rsvp-Signal-In-Packets	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Rsvp-Signal-Out-Count	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Rsvp-Signal-Out-Packets	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-SDB-Input-Octets	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-SDB-Output-Octets	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Security-Level	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Service-Option	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Service-Option-Profile	No	No	No	No	No	No	No	No
3GPP2-Service-Reference-ID	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Serving-PCF	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Session-Continue	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Session-Term-Capability	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-S-Key	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-S-Lifetime	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-S-Request	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-Subnet	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP2-S-Unencrypted	No	No	No	No	No	No	No	No
3GPP2-User-Zone	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3GPP-Allocate-IPType	No	Yes	No	No	Yes	No	Yes	No
3GPP-CAMEL-Charging-Info	No	Yes	No	No	Yes	No	Yes	No
3GPP-CG-Address	No	Yes	No	No	Yes	No	Yes	No
3GPP-Charging-Id	No	Yes	No	No	Yes	No	Yes	No
3GPP-Chrg-Char	No	Yes	No	No	Yes	No	Yes	No

Attribute	standard	3gpp	3gpp2	3gpp2-835	starent	starent-835	starent-vsa1	starent-vsa1-835
3GPP-GGSN-Address	No	Yes	No	No	Yes	No	Yes	No
3GPP-GGSN-IPv6-Address	No	Yes	No	No	Yes	No	Yes	No
3GPP-GGSN-Mcc-Mnc	No	Yes	No	No	Yes	No	Yes	No
3GPP-IMEISV	No	Yes	No	No	Yes	No	Yes	No
3GPP-IMSI	No	Yes	No	No	Yes	No	Yes	No
3GPP-IMSI-Mcc-Mnc	No	Yes	No	No	Yes	No	Yes	No
3GPP-IPv6-DNS-Servers	No	Yes	No	No	Yes	No	Yes	No
3GPP-MS-TimeZone	No	Yes	No	No	Yes	No	Yes	No
3GPP-Negotiated-DSCP	No	Yes	No	No	Yes	No	Yes	No
3GPP-Negotiated-QoS-Profile	No	Yes	No	No	Yes	No	Yes	No
3GPP-NSAPI	No	Yes	No	No	Yes	No	Yes	No
3GPP-Packet-Filter	No	Yes	No	No	Yes	No	Yes	No
3GPP-PDP-Type	No	Yes	No	No	Yes	No	Yes	No
3GPP-RAT-Type	No	Yes	No	No	Yes	No	Yes	No
3GPP-Selection-Mode	No	Yes	No	No	Yes	No	Yes	No
3GPP-Session-Stop-Ind	No	Yes	No	No	Yes	No	Yes	No
3GPP-SGSN-Address	No	Yes	No	No	Yes	No	Yes	No
3GPP-SGSN-IPv6-Address	No	Yes	No	No	Yes	No	Yes	No
3GPP-SGSN-Mcc-Mnc	No	Yes	No	No	Yes	No	Yes	No
3GPP-Teardown-Indicator	No	Yes	No	No	Yes	No	Yes	No
3GPP-User-Location-Info	No	Yes	No	No	Yes	No	Yes	No
AAA-Session-ID	No	No	No	No	Yes	No	Yes	No
Access-IN-Subs	No	No	No	No	No	No	No	No
Acct-Authentic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acct-Delay-Time	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acct-Input-Gigawords	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acct-Input-Octets	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acct-Input-Packets	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acct-Interim-Interval	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acct-Link-Count	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acct-Multi-Session-Id	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acct-Output-Gigawords	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acct-Output-Octets	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acct-Output-Packets	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acct-Session-Id	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acct-Session-Id-Long	No	No	No	No	No	No	No	No
Acct-Session-Time	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Acct-Status-Type	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acct-Termination-Cause	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acct-Tunnel-Connection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acct-Tunnel-Packets-Lost	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ARAP-Challenge-Response	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ARAP-Features	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ARAP-Password	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ARAP-Security	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ARAP-Security-Data	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ARAP-Zone-Access	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
BU-CoA-Ipv6	No	No	No	No	No	No	Yes	No

Attribute	standard	3gpp	3gpp2	3gpp2-835	starent	starent-835	starent-vsa1	starent-vsa1-835
Callback-Id	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Callback-Number	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Called-Station-ID	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Calling-Station-Id	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Calling-Subscriber-Type	No	No	No	No	No	No	No	No
CHAP-Challenge	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CHAP-Password	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Charging-Id	No	No	No	No	No	No	No	No
Class	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Configuration-Token	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Connect-Info	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CS-AVPair	No	No	No	No	Yes	Yes	Yes	Yes
CS-Prepaid-Quota	No	No	No	No	Yes	Yes	Yes	Yes
CS-Prepaid-Time-Quota	No	No	No	No	Yes	Yes	Yes	Yes
CS-Prepaid-Volume-Quota	No	No	No	No	Yes	Yes	Yes	Yes
CS-Service-Name	No	No	No	No	Yes	Yes	Yes	Yes
CUI	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
custom54-Dial-Number	No	No	No	No	No	No	No	No
custom54-IPX-Alias	No	No	No	No	No	No	No	No
custom54-Metric	No	No	No	No	No	No	No	No
custom54-PRI-Number-Type	No	No	No	No	No	No	No	No
custom54-Route-IP	No	No	No	No	No	No	No	No
Custom-Prepaid-Ind	No	No	No	No	No	No	No	No
DHCPMSG-Server-IP	No	No	No	No	Yes	No	Yes	No
DHCP-RK	No	No	No	No	Yes	No	Yes	No
DHCP-RK-Key-ID	No	No	No	No	Yes	No	Yes	No
DHCP-RK-Lifetime	No	No	No	No	Yes	No	Yes	No
Digest-AKA-Auts	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Digest-Algorithm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Digest-Auth-Param	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Digest-CNonce	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Digest-Domain	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Digest-Entity-Body-Hash	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Digest-HA1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Digest-Method	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Digest-Nonce	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Digest-Nonce-Count	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Digest-Opaque	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Digest-Qop	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Digest-Realm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Digest-Response	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Digest-Response-Auth	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Digest-Stale	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Digest-URI	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Digest-Username	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DNS	No	No	No	No	Yes	No	Yes	No
Draft5-Digest-Response	No	No	No	No	No	No	No	No

Attribute	standard	3gpp	3gpp2	3gpp2-835	starent	starent-835	starent-vsa1	starent-vsa1-835
DSCP_IP_Address	No	No	No	No	No	No	No	No
EAP-Message	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Error-Cause	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Event-Timestamp	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FA-RK-KEY	No	No	No	No	Yes	No	Yes	No
FA-RK-SPI	No	No	No	No	Yes	No	Yes	No
Filter-Id	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Framed-AppleTalk-Link	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Framed-AppleTalk-Network	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Framed-AppleTalk-Zone	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Framed-Compression	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Framed-Interface-Id	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Framed-IP-Address	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Framed-IP-Netmask	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Framed-IPv6-Pool	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Framed-IPv6-Prefix	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Framed-IPv6-Route	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Framed-IPX-Network	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Framed-MTU	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Framed-Pool	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Framed-Protocol	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Framed-Route	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Framed-Routing	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographical-Location	No	No	No	No	Yes	Yes	Yes	Yes
GGSN-GTP-IP-Address	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
GGSN-IP-Address	No	No	No	No	No	No	No	No
GMT-Time-Zone-Offset	No	No	No	No	Yes	No	Yes	No
HA-IP-MIP4	No	No	No	No	Yes	No	Yes	No
HA-IP-MIP6	No	No	No	No	Yes	No	Yes	No
HA-RK-KEY	No	No	No	No	Yes	No	Yes	No
HA-RK-Lifetime	No	No	No	No	Yes	No	Yes	No
HA-RK-SPI	No	No	No	No	Yes	No	Yes	No
hLMA-IPv6-PMIP6	No	No	No	No	Yes	No	Yes	No
HNB-Internet-Information	No	No	No	No	Yes	Yes	Yes	Yes
HNB-Parameters	No	No	No	No	Yes	Yes	Yes	Yes
Hotline-Indicator	No	No	No	No	Yes	No	Yes	No
Hotline-Profile-ID	No	No	No	No	Yes	No	Yes	No
Hotline-Session-Timer	No	No	No	No	Yes	No	Yes	No
HTTP-Redirection-Rule	No	No	No	No	Yes	No	Yes	No
Idle-Timeout	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IMSI	No	No	No	No	No	No	No	No
IMSI-MCC-MNC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IN-Packet-Period	No	No	No	No	No	No	No	No
IN-Time-Period	No	No	No	No	No	No	No	No
IP-Redirection-Rule	No	No	No	No	Yes	No	Yes	No
KTF_VSA1	No	No	No	No	No	No	No	No
KTF_VSA2	No	No	No	No	No	No	No	No
Login-IP-Host	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Attribute	standard	3gpp	3gpp2	3gpp2-835	starent	starent-835	starent-vsa1	starent-vsa1-835
Login-IPv6-Host	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Login-LAT-Group	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Login-LAT-Node	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Login-LAT-Port	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Login-LAT-Service	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Login-Service	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Login-TCP-Port	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro-Coverage-Information	No	No	No	No	Yes	Yes	Yes	Yes
Message-Authenticator	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MN-HA-MIP4-KEY	No	No	No	No	Yes	No	Yes	No
MN-HA-MIP4-SPI	No	No	No	No	Yes	No	Yes	No
MN-HA-MIP6-KEY	No	No	No	No	Yes	No	Yes	No
MN-HA-MIP6-SPI	No	No	No	No	Yes	No	Yes	No
MSISDN	No	No	No	No	No	No	No	No
MSK	No	No	No	No	Yes	No	Yes	No
NAS-Filter-Rule	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NAS-Identifier	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NAS-IP-Address	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NAS-IPv6-Address	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NAS-Port	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NAS-Port-Id	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NAS-Port-Type	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Password-Retry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PMIP6-RK-KEY	No	No	No	No	Yes	No	Yes	No
PMIP6-RK-SPI	No	No	No	No	Yes	No	Yes	No
PMIP6-Service-Info	No	No	No	No	Yes	No	Yes	No
PMIP-Authenticated-Nwk-Id	No	No	No	No	Yes	No	Yes	No
Port-Limit	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prepaid-Ind	No	No	No	No	No	No	No	No
Price-Plan	No	No	No	No	No	No	No	No
Primary-DNS-Server	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prohibit-Payload-Compression	No	No	No	No	Yes	Yes	No	No
Prohibit-Payload-Compression1	No	No	No	No	No	No	Yes	Yes
Prompt	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Proxy-State	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reject-Cause	No	No	No	No	Yes	Yes	Yes	Yes
Reply-Message	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RRQ-HA-IP	No	No	No	No	Yes	No	Yes	No
RRQ-MN-HA-KEY	No	No	No	No	Yes	No	Yes	No
Secondary-DNS-Server	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Selection-Mode	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Service-Type	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Session-Timeout	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SGSN-IP-Address	No	No	No	No	No	No	No	No
SIP-AOR	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SN1-Access-link-IP-Frag	No	No	No	No	No	No	Yes	Yes
SN1-Acct-Input-Giga-Dropped	No	No	No	No	No	No	Yes	Yes
SN1-Acct-Input-Octets-Dropped	No	No	No	No	No	No	Yes	Yes

Attribute	standard	3gpp	3gpp2	3gpp2-835	starent	starent-835	starent-vsa1	starent-vsa1-835
SN1-Acct-Input-Packets-Dropped	No	No	No	No	No	No	Yes	Yes
SN1-Acct-Output-Giga-Dropped	No	No	No	No	No	No	Yes	Yes
SN1-Acct-Output-Octets-Dropped	No	No	No	No	No	No	Yes	Yes
SN1-Acct-Output-Packets-Dropped	No	No	No	No	No	No	Yes	Yes
SN1-Admin-Expiry	No	No	No	No	No	No	Yes	Yes
SN1-Admin-Permission	No	No	No	No	No	No	Yes	Yes
SN1-Assigned-VLAN-ID	No	No	No	No	No	No	Yes	Yes
SN1-Call-Id	No	No	No	No	No	No	Yes	Yes
SN1-Cause-For-Rec-Closing	No	No	No	No	No	No	Yes	Yes
SN1-CFPPolicy-ID	No	No	No	No	No	No	Yes	Yes
SN1-Change-Condition	No	No	No	No	No	No	Yes	Yes
SN1-Charging-VPN-Name	No	No	No	No	No	No	Yes	Yes
SN1-Chrg-Char-Selection-Mode	No	No	No	No	No	No	Yes	Yes
SN1-Data-Tunnel-IgNore-DF-Bit	No	No	No	No	No	No	Yes	Yes
SN1-DHCP-Lease-Expiry-Policy	No	No	No	No	No	No	Yes	Yes
SN1-Disconnect-Reason	No	No	No	No	No	No	Yes	Yes
SN1-DNS-Proxy-Intercept-List	No	No	No	No	No	No	Yes	Yes
SN1-DNS-Proxy-Use-Subscr-Addr	No	No	No	No	No	No	Yes	Yes
SN1-Dynamic-Addr-Alloc-Ind-Flag	No	No	No	No	No	No	Yes	Yes
SN1-Ecs-Data-Volume	No	No	No	No	No	No	Yes	Yes
SN1-Enable-QoS-Renegotiation	No	No	No	No	No	No	Yes	Yes
SN1-Ext-Inline-Srvr-Context	No	No	No	No	No	No	Yes	Yes
SN1-Ext-Inline-Srvr-Down-Addr	No	No	No	No	No	No	Yes	Yes
SN1-Ext-Inline-Srvr-Down-VLAN	No	No	No	No	No	No	Yes	Yes
SN1-Ext-Inline-Srvr-Preference	No	No	No	No	No	No	Yes	Yes
SN1-Ext-Inline-Srvr-Up-Addr	No	No	No	No	No	No	Yes	Yes
SN1-Ext-Inline-Srvr-Up-VLAN	No	No	No	No	No	No	Yes	Yes
SN1-Firewall-Enabled	No	No	No	No	No	No	Yes	Yes
SN1-FMC-Location	No	No	No	No	No	No	Yes	Yes
SN1-GGSN-MIP-Required	No	No	No	No	No	No	Yes	Yes
SN1-Gratuitous-ARP-Aggressive	No	No	No	No	No	No	Yes	Yes
SN1-GTP-Version	No	No	No	No	No	No	Yes	Yes
SN1-HA-Send-DNS-Address	No	No	No	No	No	No	Yes	Yes
SN1-Home-Behavior	No	No	No	No	No	No	Yes	Yes
SN1-Home-Profile	No	No	No	No	No	No	Yes	Yes
SN1-Home-Sub-Use-GGSN	No	No	No	No	No	No	Yes	Yes
SN1-IgNore-UnkNown-HA-Addr-Err	No	No	No	No	No	No	Yes	Yes
SN1-IMS-AM-Address	No	No	No	No	No	No	Yes	Yes
SN1-IMS-AM-Domain-Name	No	No	No	No	No	No	Yes	Yes
SN1-IMSI	No	No	No	No	No	No	Yes	Yes
SN1-Inactivity-Time	No	No	No	No	No	No	Yes	Yes
SN1-Internal-SM-Index	No	No	No	No	No	No	Yes	Yes
SN1-IP-Alloc-Method	No	No	No	No	No	No	Yes	Yes
SN1-IP-Filter-In	No	No	No	No	No	No	Yes	Yes
SN1-IP-Filter-Out	No	No	No	No	No	No	Yes	Yes
SN1-IP-Header-Compression	No	No	No	No	No	No	Yes	Yes
SN1-IP-Hide-Service-Address	No	No	No	No	No	No	Yes	Yes
SN1-IP-In-ACL	No	No	No	No	No	No	Yes	Yes

Attribute	standard	3gpp	3gpp2	3gpp2-835	starent	starent-835	starent-vsa1	starent-vsa1-835
SN1-IP-In-Plcy-Grp	No	No	No	No	No	No	Yes	Yes
SN1-IP-Out-ACL	No	No	No	No	No	No	Yes	Yes
SN1-IP-Out-Plcy-Grp	No	No	No	No	No	No	Yes	Yes
SN1-IP-Pool-Name	No	No	No	No	No	No	Yes	Yes
SN1-IP-Source-Validation	No	No	No	No	No	No	Yes	Yes
SN1-IP-Source-Violate-No-Acct	No	No	No	No	No	No	Yes	Yes
SN1-IP-Src-Valid-Drop-Limit	No	No	No	No	No	No	Yes	Yes
SN1-IPv6-DNS-Proxy	No	No	No	No	No	No	Yes	Yes
SN1-IPv6-Egress-Filtering	No	No	No	No	No	No	Yes	Yes
SN1-IPv6-Min-Link-MTU	No	No	No	No	No	No	Yes	Yes
SN1-IPv6-num-rtr-advt	No	No	No	No	No	No	Yes	Yes
SN1-IPv6-Primary-DNS	No	No	No	No	No	No	Yes	Yes
SN1-IPv6-rtr-advt-interval	No	No	No	No	No	No	Yes	Yes
SN1-IPv6-Secondary-DNS	No	No	No	No	No	No	Yes	Yes
SN1-IPv6-Sec-Pool	No	No	No	No	No	No	Yes	Yes
SN1-IPv6-Sec-Prefix	No	No	No	No	No	No	Yes	Yes
SN1-L3-to-L2-Tun-Addr-Policy	No	No	No	No	No	No	Yes	Yes
SN1-Local-IP-Address	No	No	No	No	No	No	Yes	Yes
SN1-Long-Duration-Action	No	No	No	No	No	No	Yes	Yes
SN1-Long-Duration-Notification	No	No	No	No	No	No	Yes	Yes
SN1-Long-Duration-Timeout	No	No	No	No	No	No	Yes	Yes
SN1-Mediation-Acct-Rsp-Action	No	No	No	No	No	No	Yes	Yes
SN1-Mediation-Enabled	No	No	No	No	No	No	Yes	Yes
SN1-Mediation-No-Interims	No	No	No	No	No	No	Yes	Yes
SN1-Mediation-VPN-Name	No	No	No	No	No	No	Yes	Yes
SN1-Min-Compress-Size	No	No	No	No	No	No	Yes	Yes
SN1-MIP-AAA-Assign-Addr	No	No	No	No	No	No	Yes	Yes
SN1-MIP-ANCID	No	No	No	No	No	No	Yes	Yes
SN1-MIP-Dual-Anchor	No	No	No	No	No	No	Yes	Yes
SN1-MIP-HA-Assignment-Table	No	No	No	No	No	No	Yes	Yes
SN1-MIP-Match-AAA-Assign-Addr	No	No	No	No	No	No	Yes	Yes
SN1-MIP-Reg-Lifetime-Realm	No	No	No	No	No	No	Yes	Yes
SN1-MIP-Send-Ancid	No	No	No	No	No	No	Yes	Yes
SN1-MIP-Send-Correlation-Info	No	No	No	No	No	No	Yes	Yes
SN1-MIP-Send-Imsi	No	No	No	No	No	No	Yes	Yes
SN1-MIP-Send-Term-Verification	No	No	No	No	No	No	Yes	Yes
SN1-MN-HA-Hash-Algorithm	No	No	No	No	No	No	Yes	Yes
SN1-MN-HA-Timestamp-Tolerance	No	No	No	No	No	No	Yes	Yes
SN1-MS-ISDN	No	No	No	No	No	No	Yes	Yes
SN1-NAI-Construction-Domain	No	No	No	No	No	No	Yes	Yes
SN1-NAT-Bind-Record	No	No	No	No	No	No	Yes	Yes
SN1-NAT-Info-Record	No	No	No	No	No	No	Yes	Yes
SN1-NAT-IP-Address	No	No	No	No	No	No	Yes	Yes
SN1-NAT-IP-Address-Old	No	No	No	No	No	No	Yes	Yes
SN1-NPU-Qos-Priority	No	No	No	No	No	No	Yes	Yes
SN1-Ntk-Initiated-Ctx-Ind-Flag	No	No	No	No	No	No	Yes	Yes
SN1-Ntk-Session-Disconnect-Flag	No	No	No	No	No	No	Yes	Yes
SN1-Nw-Reachability-Server-Name	No	No	No	No	No	No	Yes	Yes

Attribute	standard	3gpp	3gpp2	3gpp2-835	starent	starent-835	starent-vsa1	starent-vsa1-835
SN1-Overload-Disc-Connect-Time	No	No	No	No	No	No	Yes	Yes
SN1-Overload-Disc-Inact-Time	No	No	No	No	No	No	Yes	Yes
SN1-Overload-Disconnect	No	No	No	No	No	No	Yes	Yes
SN1-PDIF-MIP-Release-TIA	No	No	No	No	No	No	Yes	Yes
SN1-PDIF-MIP-Required	No	No	No	No	No	No	Yes	Yes
SN1-PDIF-MIP-Simple-IP-Fallback	No	No	No	No	No	No	Yes	Yes
SN1-PDSN-Correlation-Id	No	No	No	No	No	No	Yes	Yes
SN1-PDSN-Handoff-Req-IP-Addr	No	No	No	No	No	No	Yes	Yes
SN1-PDSN-NAS-Id	No	No	No	No	No	No	Yes	Yes
SN1-PDSN-NAS-IP-Address	No	No	No	No	No	No	Yes	Yes
SN1-Permit-User-Mcast-PDUs	No	No	No	No	No	No	Yes	Yes
SN1-PPP-Accept-Peer-v6Ifid	No	No	No	No	No	No	Yes	Yes
SN1-PPP-Always-On-Vse	No	No	No	No	No	No	Yes	Yes
SN1-PPP-Data-Compression	No	No	No	No	No	No	Yes	Yes
SN1-PPP-Data-Compression-Mode	No	No	No	No	No	No	Yes	Yes
SN1-PPP-Keepalive	No	No	No	No	No	No	Yes	Yes
SN1-PPP-NW-Layer-IPv4	No	No	No	No	No	No	Yes	Yes
SN1-PPP-NW-Layer-IPv6	No	No	No	No	No	No	Yes	Yes
SN1-PPP-Outbound-Password	No	No	No	No	No	No	Yes	Yes
SN1-PPP-Outbound-Username	No	No	No	No	No	No	Yes	Yes
SN1-PPP-Progress-Code	No	No	No	No	No	No	Yes	Yes
SN1-PPP-Reneg-Disc	No	No	No	No	No	No	Yes	Yes
SN1-Prepaid	No	No	No	No	No	No	Yes	Yes
SN1-Prepaid-Compressed-Count	No	No	No	No	No	No	Yes	Yes
SN1-Prepaid-Final-Duration-Alg	No	No	No	No	No	No	Yes	Yes
SN1-Prepaid-Inbound-Octets	No	No	No	No	No	No	Yes	Yes
SN1-Prepaid-Outbound-Octets	No	No	No	No	No	No	Yes	Yes
SN1-Prepaid-Preference	No	No	No	No	No	No	Yes	Yes
SN1-Prepaid-Profile	No	No	No	No	No	No	Yes	Yes
SN1-Prepaid-Timeout	No	No	No	No	No	No	Yes	Yes
SN1-Prepaid-Total-Octets	No	No	No	No	No	No	Yes	Yes
SN1-Prepaid-Watermark	No	No	No	No	No	No	Yes	Yes
SN1-Primary-DCCA-Peer	No	No	No	No	No	No	Yes	Yes
SN1-Primary-DNS-Server	No	No	No	No	No	No	Yes	Yes
SN1-Primary-NBNS-Server	No	No	No	No	No	No	Yes	Yes
SN1-Proxy-MIP	No	No	No	No	No	No	Yes	Yes
SN1-QoS-Background-Class	No	No	No	No	No	No	Yes	Yes
SN1-QoS-Class-Background-PHB	No	No	No	No	No	No	Yes	Yes
SN1-QoS-Class-Converstional-PHB	No	No	No	No	No	No	Yes	Yes
SN1-QoS-Class-Interactive-1-PHB	No	No	No	No	No	No	Yes	Yes
SN1-QoS-Class-Interactive-2-PHB	No	No	No	No	No	No	Yes	Yes
SN1-QoS-Class-Interactive-3-PHB	No	No	No	No	No	No	Yes	Yes
SN1-QoS-Class-Streaming-PHB	No	No	No	No	No	No	Yes	Yes
SN1-QoS-Conversation-Class	No	No	No	No	No	No	Yes	Yes
SN1-QoS-Interactive1-Class	No	No	No	No	No	No	Yes	Yes
SN1-QoS-Interactive2-Class	No	No	No	No	No	No	Yes	Yes
SN1-QoS-Interactive3-Class	No	No	No	No	No	No	Yes	Yes
SN1-QoS-Negotiated	No	No	No	No	No	No	Yes	Yes

Attribute	standard	3gpp	3gpp2	3gpp2-835	starent	starent-835	starent-vsa1	starent-vsa1-835
SN1-QoS-Renegotiation-Timeout	No	No	No	No	No	No	Yes	Yes
SN1-QoS-Streaming-Class	No	No	No	No	No	No	Yes	Yes
SN1-QoS-Tp-Dnlk	No	No	No	No	No	No	Yes	Yes
SN1-QoS-Tp-Uplk	No	No	No	No	No	No	Yes	Yes
SN1-QoS-Traffic-Policy	No	No	No	No	No	No	Yes	Yes
SN1-Rad-APN-Name	No	No	No	No	No	No	Yes	Yes
SN1-Radius-Returned-Username	No	No	No	No	No	No	Yes	Yes
SN1-Re-CHAP-Interval	No	No	No	No	No	No	Yes	Yes
SN1-Roaming-Behavior	No	No	No	No	No	No	Yes	Yes
SN1-Roaming-Profile	No	No	No	No	No	No	Yes	Yes
SN1-Roaming-Sub-Use-GGSN	No	No	No	No	No	No	Yes	Yes
SN1-ROHC-Direction	No	No	No	No	No	No	Yes	Yes
SN1-ROHC-Flow-Marking-Mode	No	No	No	No	No	No	Yes	Yes
SN1-ROHC-Mode	No	No	No	No	No	No	Yes	Yes
SN1-ROHC-Profile-Name	No	No	No	No	No	No	Yes	Yes
SN1-Routing-Area-Id	No	No	No	No	No	No	Yes	Yes
SN1-Rulebase	No	No	No	No	No	No	Yes	Yes
SN1-Secondary-DCCA-Peer	No	No	No	No	No	No	Yes	Yes
SN1-Secondary-DNS-Server	No	No	No	No	No	No	Yes	Yes
SN1-Secondary-NBNS-Server	No	No	No	No	No	No	Yes	Yes
SN1-Service-Address	No	No	No	No	No	No	Yes	Yes
SN1-Service-Type	No	No	No	No	No	No	Yes	Yes
SN1-Simultaneous-SIP-MIP	No	No	No	No	No	No	Yes	Yes
SN1-Subs-Acc-Flow-Traffic-Valid	No	No	No	No	No	No	Yes	Yes
SN1-Subscriber-Accounting	No	No	No	No	No	No	Yes	Yes
SN1-Subscriber-Acct-Interim	No	No	No	No	No	No	Yes	Yes
SN1-Subscriber-Acct-Mode	No	No	No	No	No	No	Yes	Yes
SN1-Subscriber-Acct-Rsp-Action	No	No	No	No	No	No	Yes	Yes
SN1-Subscriber-Acct-Start	No	No	No	No	No	No	Yes	Yes
SN1-Subscriber-Acct-Stop	No	No	No	No	No	No	Yes	Yes
SN1-Subscriber-Class	No	No	No	No	No	No	Yes	Yes
SN1-Subscriber-Dormant-Activity	No	No	No	No	No	No	Yes	Yes
SN1-Subscriber-IP-Hdr-Neg-Mode	No	No	No	No	No	No	Yes	Yes
SN1-Subscriber-IP-TOS-Copy	No	No	No	No	No	No	Yes	Yes
SN1-Subscriber-Nexthop-Address	No	No	No	No	No	No	Yes	Yes
SN1-Subscriber-No-Interims	No	No	No	No	No	No	Yes	Yes
SN1-Subscriber-Permission	No	No	No	No	No	No	Yes	Yes
SN1-Subscriber-Template-Name	No	No	No	No	No	No	Yes	Yes
SN1-Subs-IMSA-Service-Name	No	No	No	No	No	No	Yes	Yes
SN1-Subs-VJ-Slotid-Cmp-Neg-Mode	No	No	No	No	No	No	Yes	Yes
SN1-Tp-Dnlk-Burst-Size	No	No	No	No	No	No	Yes	Yes
SN1-Tp-Dnlk-Committed-Data-Rate	No	No	No	No	No	No	Yes	Yes
SN1-Tp-Dnlk-Exceed-Action	No	No	No	No	No	No	Yes	Yes
SN1-Tp-Dnlk-Peak-Data-Rate	No	No	No	No	No	No	Yes	Yes
SN1-Tp-Dnlk-Violate-Action	No	No	No	No	No	No	Yes	Yes
SN1-Tp-Uplk-Burst-Size	No	No	No	No	No	No	Yes	Yes
SN1-Tp-Uplk-Committed-Data-Rate	No	No	No	No	No	No	Yes	Yes
SN1-Tp-Uplk-Exceed-Action	No	No	No	No	No	No	Yes	Yes

Attribute	standard	3gpp	3gpp2	3gpp2-835	starent	starent-835	starent-vsa1	starent-vsa1-835
SN1-Tp-Uplk-Peak-Data-Rate	No	No	No	No	No	No	Yes	Yes
SN1-Tp-Uplk-Violate-Action	No	No	No	No	No	No	Yes	Yes
SN1-Traffic-Group	No	No	No	No	No	No	Yes	Yes
SN1-Transparent-Data	No	No	No	No	No	No	Yes	Yes
SN1-Tun-Addr-Policy	No	No	No	No	No	No	Yes	Yes
SN1-Tunnel-Gn	No	No	No	No	No	No	Yes	Yes
SN1-Tunnel-ISAKMP-Crypto-Map	No	No	No	No	No	No	Yes	Yes
SN1-Tunnel-ISAKMP-Secret	No	No	No	No	No	No	Yes	Yes
SN1-Tunnel-Load-Balancing	No	No	No	No	No	No	Yes	Yes
SN1-Tunnel-Password	No	No	No	No	No	No	Yes	Yes
SN1-Unclassify-List-Name	No	No	No	No	No	No	Yes	Yes
SN1-Virtual-APN-Name	No	No	No	No	No	No	Yes	Yes
SN1-Visiting-Behavior	No	No	No	No	No	No	Yes	Yes
SN1-Visiting-Profile	No	No	No	No	No	No	Yes	Yes
SN1-Visiting-Sub-Use-GGSN	No	No	No	No	No	No	Yes	Yes
SN1-Voice-Push-List-Name	No	No	No	No	No	No	Yes	Yes
SN1-VPN-ID	No	No	No	No	No	No	Yes	Yes
SN1-VPN-Name	No	No	No	No	No	No	Yes	Yes
SNA1-PPP-Unfr-data-In-Gig	No	No	No	No	No	No	Yes	Yes
SNA1-PPP-Unfr-data-In-Oct	No	No	No	No	No	No	Yes	Yes
SNA1-PPP-Unfr-data-Out-Gig	No	No	No	No	No	No	Yes	Yes
SNA1-PPP-Unfr-data-Out-Oct	No	No	No	No	No	No	Yes	Yes
SN-Access-link-IP-Frag	No	No	No	No	Yes	Yes	No	No
SN-Acct-Input-Giga-Dropped	No	No	No	No	Yes	Yes	No	No
SN-Acct-Input-Octets-Dropped	No	No	No	No	Yes	Yes	No	No
SN-Acct-Input-Packets-Dropped	No	No	No	No	Yes	Yes	No	No
SN-Acct-Output-Giga-Dropped	No	No	No	No	Yes	Yes	No	No
SN-Acct-Output-Octets-Dropped	No	No	No	No	Yes	Yes	No	No
SN-Acct-Output-Packets-Dropped	No	No	No	No	Yes	Yes	No	No
SN-Acs-Credit-Control-Group	No	No	No	No	Yes	Yes	No	No
SN-Admin-Expiry	No	No	No	No	Yes	Yes	No	No
SN-Admin-Permission	No	No	No	No	Yes	Yes	No	No
SNA-Input-Gigawords	No	No	No	No	No	No	No	No
SNA-Input-Octets	No	No	No	No	No	No	No	No
SN-ANID	No	No	No	No	No	No	No	No
SNA-Output-Gigawords	No	No	No	No	No	No	No	No
SNA-Output-Octets	No	No	No	No	No	No	No	No
SNA-PPP-Bad-Addr	No	No	No	No	Yes	Yes	No	No
SNA-PPP-Bad-Ctrl	No	No	No	No	Yes	Yes	No	No
SNA-PPP-Bad-FCS	No	No	No	No	Yes	Yes	No	No
SNA-PPP-Ctrl-Input-Octets	No	No	No	No	Yes	Yes	No	No
SNA-PPP-Ctrl-Input-Packets	No	No	No	No	Yes	Yes	No	No
SNA-PPP-Ctrl-Output-Octets	No	No	No	No	Yes	Yes	No	No
SNA-PPP-Ctrl-Output-Packets	No	No	No	No	Yes	Yes	No	No
SNA-PPP-Discards-Input	No	No	No	No	Yes	Yes	No	No
SNA-PPP-Discards-Output	No	No	No	No	Yes	Yes	No	No
SNA-PPP-Echo-Req-Input	No	No	No	No	Yes	Yes	No	No
SNA-PPP-Echo-Req-Output	No	No	No	No	Yes	Yes	No	No

Attribute	standard	3gpp	3gpp2	3gpp2-835	starent	starent-835	starent-vsa1	starent-vsa1-835
SNA-PPP-Echo-Rsp-Input	No	No	No	No	Yes	Yes	No	No
SNA-PPP-Echo-Rsp-Output	No	No	No	No	Yes	Yes	No	No
SNA-PPP-Errors-Input	No	No	No	No	Yes	Yes	No	No
SNA-PPP-Errors-Output	No	No	No	No	Yes	Yes	No	No
SNA-PPP-Framed-Input-Octets	No	No	No	No	Yes	Yes	No	No
SNA-PPP-Framed-Output-Octets	No	No	No	No	Yes	Yes	No	No
SNA-PPP-Packet-Too-Long	No	No	No	No	Yes	Yes	No	No
SNA-PPP-Unfr-data-In-Gig	No	No	No	No	Yes	Yes	No	No
SNA-PPP-Unfr-data-In-Oct	No	No	No	No	Yes	Yes	No	No
SNA-PPP-Unfr-data-Out-Gig	No	No	No	No	Yes	Yes	No	No
SNA-PPP-Unfr-data-Out-Oct	No	No	No	No	Yes	Yes	No	No
SNA-RPRAK-Rcvd-Acc-Ack	No	No	No	No	Yes	Yes	No	No
SNA-RPRAK-Rcvd-Mis-ID	No	No	No	No	Yes	Yes	No	No
SNA-RPRAK-Rcvd-Msg-Auth-Fail	No	No	No	No	Yes	Yes	No	No
SNA-RPRAK-Rcvd-Total	No	No	No	No	Yes	Yes	No	No
SNA-RP-Reg-Reply-Sent-Acc-Dereg	No	No	No	No	Yes	Yes	No	No
SNA-RP-Reg-Reply-Sent-Acc-Reg	No	No	No	No	Yes	Yes	No	No
SNA-RP-Reg-Reply-Sent-Bad-Req	No	No	No	No	Yes	Yes	No	No
SNA-RP-Reg-Reply-Sent-Denied	No	No	No	No	Yes	Yes	No	No
SNA-RP-Reg-Reply-Sent-Mis-ID	No	No	No	No	Yes	Yes	No	No
SNA-RP-Reg-Reply-Sent-Send-Err	No	No	No	No	Yes	Yes	No	No
SNA-RP-Reg-Reply-Sent-Total	No	No	No	No	Yes	Yes	No	No
SNA-RP-Reg-Upd-Re-Sent	No	No	No	No	Yes	Yes	No	No
SNA-RP-Reg-Upd-Send-Err	No	No	No	No	Yes	Yes	No	No
SNA-RP-Reg-Upd-Sent	No	No	No	No	Yes	Yes	No	No
SNA-RPQQ-Rcvd-Acc-Dereg	No	No	No	No	Yes	Yes	No	No
SNA-RPQQ-Rcvd-Acc-Reg	No	No	No	No	Yes	Yes	No	No
SNA-RPQQ-Rcvd-Badly-Formed	No	No	No	No	Yes	Yes	No	No
SNA-RPQQ-Rcvd-Mis-ID	No	No	No	No	Yes	Yes	No	No
SNA-RPQQ-Rcvd-Msg-Auth-Fail	No	No	No	No	Yes	Yes	No	No
SNA-RPQQ-Rcvd-T-Bit-Not-Set	No	No	No	No	Yes	Yes	No	No
SNA-RPQQ-Rcvd-Total	No	No	No	No	Yes	Yes	No	No
SNA-RPQQ-Rcvd-VID-Unsupported	No	No	No	No	Yes	Yes	No	No
SN-Assigned-VLAN-ID	No	No	No	No	Yes	Yes	No	No
SN-Authorised-Qos	No	No	No	No	Yes	Yes	No	No
SN-Bandwidth-Policy	No	No	No	No	Yes	Yes	No	No
SN-Call-Id	No	No	No	No	Yes	Yes	No	No
SN-Cause-Code	No	No	No	No	Yes	Yes	No	No
SN-Cause-For-Rec-Closing	No	No	No	No	Yes	Yes	No	No
SN-CBB-Policy	No	No	No	No	Yes	Yes	No	No
SN-CF-Call-International	No	No	No	No	Yes	Yes	No	No
SN-CF-Call-Local	No	No	No	No	Yes	Yes	No	No
SN-CF-Call-LongDistance	No	No	No	No	Yes	Yes	No	No
SN-CF-Call-Premium	No	No	No	No	Yes	Yes	No	No
SN-CF-Call-RoamingInternatl	No	No	No	No	Yes	Yes	No	No
SN-CF-Call-Transfer	No	No	No	No	Yes	Yes	No	No
SN-CF-Call-Waiting	No	No	No	No	Yes	Yes	No	No
SN-CF-CId-Display	No	No	No	No	Yes	Yes	No	No

Attribute	standard	3gpp	3gpp2	3gpp2-835	starent	starent-835	starent-vsa1	starent-vsa1-835
SN-CF-CId-Display-Blocked	No	No	No	No	Yes	Yes	No	No
SN-CF-Follow-Me	No	No	No	No	Yes	Yes	No	No
SN-CF-Forward-Busy-Line	No	No	No	No	Yes	Yes	No	No
SN-CF-Forward-No-Answer	No	No	No	No	Yes	Yes	No	No
SN-CF-Forward-Not-Regd	No	No	No	No	Yes	Yes	No	No
SN-CF-Forward-Unconditional	No	No	No	No	Yes	Yes	No	No
SN-CFPolicy-ID	No	No	No	No	Yes	Yes	No	No
SN-Change-Condition	No	No	No	No	Yes	Yes	No	No
SN-Charging-VPN-Name	No	No	No	No	Yes	Yes	No	No
SN-Chrg-Char-Selection-Mode	No	No	No	No	Yes	Yes	No	No
SN-Content-Disposition	No	No	No	No	Yes	Yes	No	No
SN-Content-Length	No	No	No	No	Yes	Yes	No	No
SN-Content-Type	No	No	No	No	Yes	Yes	No	No
SN-CR-International-Cid	No	No	No	No	Yes	Yes	No	No
SN-CR-LongDistance-Cid	No	No	No	No	Yes	Yes	No	No
SN-CSCF-App-Server-Info	No	No	No	No	Yes	Yes	No	No
SN-CSCF-Rf-SDP-Media-Components	No	No	No	No	Yes	Yes	No	No
SN-Cscf-Subscriber-Ip-Address	No	No	No	No	Yes	Yes	No	No
SN-Data-Tunnel-IgNore-DF-Bit	No	No	No	No	Yes	Yes	No	No
SN-DHCP-Lease-Expiry-Policy	No	No	No	No	Yes	Yes	No	No
SN-DHCP-Options	No	No	No	No	Yes	Yes	No	No
SN-Direction	No	No	No	No	Yes	Yes	No	No
SN-Disconnect-Reason	No	No	No	No	Yes	Yes	No	No
SN-DNS-Proxy-Intercept-List	No	No	No	No	Yes	Yes	No	No
SN-DNS-Proxy-Use-Subscr-Addr	No	No	No	No	Yes	Yes	No	No
SN-Dynamic-Addr-Alloc-Ind-Flag	No	No	No	No	Yes	Yes	No	No
SN-Ecs-Data-Volume	No	No	No	No	Yes	Yes	No	No
SN-Enable-QoS-Renegotiation	No	No	No	No	Yes	Yes	No	No
SN-Event	No	No	No	No	Yes	Yes	No	No
SN-Ext-Inline-Srvr-Context	No	No	No	No	Yes	Yes	No	No
SN-Ext-Inline-Srvr-Down-Addr	No	No	No	No	Yes	Yes	No	No
SN-Ext-Inline-Srvr-Down-VLAN	No	No	No	No	Yes	Yes	No	No
SN-Ext-Inline-Srvr-Preference	No	No	No	No	Yes	Yes	No	No
SN-Ext-Inline-Srvr-Up-Addr	No	No	No	No	Yes	Yes	No	No
SN-Ext-Inline-Srvr-Up-VLAN	No	No	No	No	Yes	Yes	No	No
SN-Fast-Reauth-Username	No	No	No	No	Yes	Yes	No	No
SN-Firewall-Enabled	No	No	No	No	Yes	Yes	No	No
SN-Firewall-Policy	No	No	No	No	Yes	Yes	No	No
SN-FMC-Location	No	No	No	No	Yes	Yes	No	No
SN-GGSN-Address	No	No	No	No	Yes	Yes	No	No
SN-GGSN-MIP-Required	No	No	No	No	Yes	Yes	No	No
SN-Gratuitous-ARP-Aggressive	No	No	No	No	Yes	Yes	No	No
SN-GTP-Version	No	No	No	No	Yes	Yes	No	No
SN-Handoff-Indicator	No	No	No	No	Yes	Yes	No	No
SN-HA-Send-DNS-Address	No	No	No	No	Yes	Yes	No	No
SN-Home-Behavior	No	No	No	No	Yes	Yes	No	No
SN-Home-Profile	No	No	No	No	Yes	Yes	No	No
SN-Home-Sub-Use-GGSN	No	No	No	No	Yes	Yes	No	No

Attribute	standard	3gpp	3gpp2	3gpp2-835	starent	starent-835	starent-vsa1	starent-vsa1-835
SN-IgNore-UnkNone-HA-Addr-Error	No	No	No	No	Yes	Yes	No	No
SN-IMS-AM-Address	No	No	No	No	Yes	Yes	No	No
SN-IMS-AM-Domain-Name	No	No	No	No	Yes	Yes	No	No
SN-IMS-Charging-Identifier	No	No	No	No	Yes	Yes	No	No
SN-IMSI	No	No	No	No	Yes	Yes	No	No
SN-Inactivity-Time	No	No	No	No	Yes	Yes	No	No
SN-Internal-SM-Index	No	No	No	No	Yes	Yes	No	No
SN-IP-Alloc-Method	No	No	No	No	Yes	Yes	No	No
SN-IP-Filter-In	No	No	No	No	Yes	Yes	No	No
SN-IP-Filter-Out	No	No	No	No	Yes	Yes	No	No
SN-IP-Header-Compression	No	No	No	No	Yes	Yes	No	No
SN-IP-Hide-Service-Address	No	No	No	No	Yes	Yes	No	No
SN-IP-In-ACL	No	No	No	No	Yes	Yes	No	No
SN-IP-In-Plcy-Grp	No	No	No	No	Yes	Yes	No	No
SN-IP-Out-ACL	No	No	No	No	Yes	Yes	No	No
SN-IP-Out-Plcy-Grp	No	No	No	No	Yes	Yes	No	No
SN-IP-Pool-Name	No	No	No	No	Yes	Yes	No	No
SN-IP-Source-Validation	No	No	No	No	Yes	Yes	No	No
SN-IP-Source-Violate-No-Acct	No	No	No	No	Yes	Yes	No	No
SN-IP-Src-Validation-Drop-Limit	No	No	No	No	Yes	Yes	No	No
SN-IPv6-DNS-Proxy	No	No	No	No	Yes	Yes	No	No
SN-IPv6-Egress-Filtering	No	No	No	No	Yes	Yes	No	No
SN-IPv6-Min-Link-MTU	No	No	No	No	Yes	Yes	No	No
SN-IPv6-num-rtr-advt	No	No	No	No	Yes	Yes	No	No
SN-IPv6-Primary-DNS	No	No	No	No	Yes	Yes	No	No
SN-IPv6-rtr-advt-interval	No	No	No	No	Yes	Yes	No	No
SN-IPv6-Secondary-DNS	No	No	No	No	Yes	Yes	No	No
SN-IPv6-Sec-Pool	No	No	No	No	Yes	Yes	No	No
SN-IPv6-Sec-Prefix	No	No	No	No	Yes	Yes	No	No
SN-ISC-Template-Name	No	No	No	No	Yes	Yes	No	No
SN-Is-Unregistered-Subscriber	No	No	No	No	Yes	Yes	No	No
SN-L3-to-L2-Tun-Addr-Policy	No	No	No	No	Yes	Yes	No	No
SN-Local-IP-Address	No	No	No	No	Yes	Yes	No	No
SN-Long-Duration-Action	No	No	No	No	Yes	Yes	No	No
SN-Long-Duration-Notification	No	No	No	No	Yes	Yes	No	No
SN-Long-Duration-Timeout	No	No	No	No	Yes	Yes	No	No
SN-Max-Sec-Contexts-Per-Subs	No	No	No	No	Yes	Yes	No	No
SN-Mediation-Acct-Rsp-Action	No	No	No	No	Yes	Yes	No	No
SN-Mediation-Enabled	No	No	No	No	Yes	Yes	No	No
SN-Mediation-No-Interims	No	No	No	No	Yes	Yes	No	No
SN-Mediation-VPN-Name	No	No	No	No	Yes	Yes	No	No
SN-Min-Compress-Size	No	No	No	No	Yes	Yes	No	No
SN-MIP-AAA-Assign-Addr	No	No	No	No	Yes	Yes	No	No
SN-MIP-ANCID	No	No	No	No	Yes	Yes	No	No
SN-MIP-Dual-Anchor	No	No	No	No	Yes	Yes	No	No
SN-MIP-HA-Assignment-Table	No	No	No	No	Yes	Yes	No	No
SN-MIP-Match-AAA-Assign-Addr	No	No	No	No	Yes	Yes	No	No
SN-MIP-Reg-Lifetime-Realm	No	No	No	No	Yes	Yes	No	No

Attribute	standard	3gpp	3gpp2	3gpp2-835	starent	starent-835	starent-vsa1	starent-vsa1-835
SN-MIP-Send-Ancid	No	No	No	No	Yes	Yes	No	No
SN-MIP-Send-Correlation-Info	No	No	No	No	Yes	Yes	No	No
SN-MIP-Send-Host-Config	No	No	No	No	Yes	Yes	No	No
SN-MIP-Send-Imsi	No	No	No	No	Yes	Yes	No	No
SN-MIP-Send-Term-Verification	No	No	No	No	Yes	Yes	No	No
SN-MN-HA-Hash-Algorithm	No	No	No	No	Yes	Yes	No	No
SN-MN-HA-Timestamp-Tolerance	No	No	No	No	Yes	Yes	No	No
SN-Mode	No	No	No	No	Yes	Yes	No	No
SN-MS-ISDN	No	No	No	No	Yes	Yes	No	No
SN-NAI-Construction-Domain	No	No	No	No	Yes	Yes	No	No
SN-NAT-IP-Address	No	No	No	No	Yes	Yes	No	No
SN-Node-Functionality	No	No	No	No	Yes	Yes	No	No
SN-NPU-Qos-Priority	No	No	No	No	Yes	Yes	No	No
SN-Ntk-Initiated-Ctx-Ind-Flag	No	No	No	No	Yes	Yes	No	No
SN-Ntk-Session-Disconnect-Flag	No	No	No	No	Yes	Yes	No	No
SN-Nw-Reachability-Server-Name	No	No	No	No	Yes	Yes	No	No
SN-Originating-IOI	No	No	No	No	Yes	Yes	No	No
SN-Overload-Disc-Connect-Time	No	No	No	No	Yes	Yes	No	No
SN-Overload-Disc-Inact-Time	No	No	No	No	Yes	Yes	No	No
SN-Overload-Disconnect	No	No	No	No	Yes	Yes	No	No
SN-PDG-TTG-Required	No	No	No	No	Yes	Yes	No	No
SN-PDIF-MIP-Release-TIA	No	No	No	No	Yes	Yes	No	No
SN-PDIF-MIP-Required	No	No	No	No	Yes	Yes	No	No
SN-PDIF-MIP-Simple-IP-Fallback	No	No	No	No	Yes	Yes	No	No
SN-PDSN-Correlation-Id	No	No	No	No	Yes	Yes	No	No
SN-PDSN-Handoff-Req-IP-Addr	No	No	No	No	Yes	Yes	No	No
SN-PDSN-NAS-Id	No	No	No	No	Yes	Yes	No	No
SN-PDSN-NAS-IP-Address	No	No	No	No	Yes	Yes	No	No
SN-Permit-User-Mcast-PDUs	No	No	No	No	Yes	Yes	No	No
SN-PPP-Accept-Peer-v6Ifid	No	No	No	No	Yes	Yes	No	No
SN-PPP-Always-On-Vse	No	No	No	No	Yes	Yes	No	No
SN-PPP-Data-Compression	No	No	No	No	Yes	Yes	No	No
SN-PPP-Data-Compression-Mode	No	No	No	No	Yes	Yes	No	No
SN-PPP-Keepalive	No	No	No	No	Yes	Yes	No	No
SN-PPP-NW-Layer-IPv4	No	No	No	No	Yes	Yes	No	No
SN-PPP-NW-Layer-IPv6	No	No	No	No	Yes	Yes	No	No
SN-PPP-Outbound-Password	No	No	No	No	Yes	Yes	No	No
SN-PPP-Outbound-Username	No	No	No	No	Yes	Yes	No	No
SN-PPP-Progress-Code	No	No	No	No	Yes	Yes	No	No
SN-PPP-Reneg-Disc	No	No	No	No	Yes	Yes	No	No
SN-Prepaid	No	No	No	No	Yes	Yes	No	No
SN-Prepaid-Compressed-Count	No	No	No	No	Yes	Yes	No	No
SN-Prepaid-Final-Duration-Alg	No	No	No	No	Yes	Yes	No	No
SN-Prepaid-Inbound-Octets	No	No	No	No	Yes	Yes	No	No
SN-Prepaid-Outbound-Octets	No	No	No	No	Yes	Yes	No	No
SN-Prepaid-Preference	No	No	No	No	Yes	Yes	No	No
SN-Prepaid-Timeout	No	No	No	No	Yes	Yes	No	No
SN-Prepaid-Total-Octets	No	No	No	No	Yes	Yes	No	No

Attribute	standard	3gpp	3gpp2	3gpp2-835	starent	starent-835	starent-vsa1	starent-vsa1-835
SN-Prepaid-Watermark	No	No	No	No	Yes	Yes	No	No
SN-Primary-DCCA-Peer	No	No	No	No	Yes	Yes	No	No
SN-Primary-DNS-Server	No	No	No	No	Yes	Yes	No	No
SN-Primary-NBNS-Server	No	No	No	No	Yes	Yes	No	No
SN-Proxy-MIP	No	No	No	No	Yes	Yes	No	No
SN-Pseudonym-Username	No	No	No	No	Yes	Yes	No	No
SN-QoS-Background-Class	No	No	No	No	Yes	Yes	No	No
SN-QoS-Class-Background-PHB	No	No	No	No	Yes	Yes	No	No
SN-QoS-Class-Conversational-PHB	No	No	No	No	Yes	Yes	No	No
SN-QoS-Class-Interactive-1-PHB	No	No	No	No	Yes	Yes	No	No
SN-QoS-Class-Interactive-2-PHB	No	No	No	No	Yes	Yes	No	No
SN-QoS-Class-Interactive-3-PHB	No	No	No	No	Yes	Yes	No	No
SN-QoS-Class-Streaming-PHB	No	No	No	No	Yes	Yes	No	No
SN-QoS-Conversation-Class	No	No	No	No	Yes	Yes	No	No
SN-QOS-HLR-Profile	No	No	No	No	Yes	Yes	No	No
SN-QoS-Interactive1-Class	No	No	No	No	Yes	Yes	No	No
SN-QoS-Interactive2-Class	No	No	No	No	Yes	Yes	No	No
SN-QoS-Interactive3-Class	No	No	No	No	Yes	Yes	No	No
SN-QoS-Negotiated	No	No	No	No	Yes	Yes	No	No
SN-QoS-Renegotiation-Timeout	No	No	No	No	Yes	Yes	No	No
SN-QoS-Streaming-Class	No	No	No	No	Yes	Yes	No	No
SN-QoS-Tp-Dnlk	No	No	No	No	Yes	Yes	No	No
SN-QoS-Tp-Uplk	No	No	No	No	Yes	Yes	No	No
SN-QoS-Traffic-Policy	No	No	No	No	Yes	Yes	No	No
SN-Rad-APN-Name	No	No	No	No	Yes	Yes	No	No
SN-Radius-Returned-Username	No	No	No	No	Yes	Yes	No	No
SN-Re-CHAP-Interval	No	No	No	No	Yes	Yes	No	No
SN-Roaming-Behavior	No	No	No	No	Yes	Yes	No	No
SN-Roaming-Profile	No	No	No	No	Yes	Yes	No	No
SN-Roaming-Sub-Use-GGSN	No	No	No	No	Yes	Yes	No	No
SN-ROHC-Flow-Marking-Mode	No	No	No	No	Yes	Yes	No	No
SN-ROHC-Profile-Name	No	No	No	No	Yes	Yes	No	No
SN-Role-Of-Node	No	No	No	No	Yes	Yes	No	No
SN-Routing-Area-Id	No	No	No	No	Yes	Yes	No	No
SN-Rulebase	No	No	No	No	Yes	Yes	No	No
SN-SDP-Session-Description	No	No	No	No	Yes	Yes	No	No
SN-Sec-IP-Pool-Name	No	No	No	No	Yes	Yes	No	No
SN-Secondary-DCCA-Peer	No	No	No	No	Yes	Yes	No	No
SN-Secondary-DNS-Server	No	No	No	No	Yes	Yes	No	No
SN-Secondary-NBNS-Server	No	No	No	No	Yes	Yes	No	No
SN-Service-Address	No	No	No	No	Yes	Yes	No	No
SN-Service-Type	No	No	No	No	Yes	Yes	No	No
SN-Session-Id	No	No	No	No	Yes	Yes	No	No
SN-Simultaneous-SIP-MIP	No	No	No	No	Yes	Yes	No	No
SN-SIP-Method	No	No	No	No	Yes	Yes	No	No
SN-SIP-Request-Time-Stamp	No	No	No	No	Yes	Yes	No	No
SN-SIP-Response-Time-Stamp	No	No	No	No	Yes	Yes	No	No
SN-Software-Version	No	No	No	No	Yes	Yes	No	No

Attribute	standard	3gpp	3gpp2	3gpp2-835	starent	starent-835	starent-vsa1	starent-vsa1-835
SN-Subs-Acc-Flow-Traffic-Valid	No	No	No	No	Yes	Yes	No	No
SN-Subscriber-Accounting	No	No	No	No	Yes	Yes	No	No
SN-Subscriber-Acct-Interim	No	No	No	No	Yes	Yes	No	No
SN-Subscriber-Acct-Mode	No	No	No	No	Yes	Yes	No	No
SN-Subscriber-Acct-Rsp-Action	No	No	No	No	Yes	Yes	No	No
SN-Subscriber-Acct-Start	No	No	No	No	Yes	Yes	No	No
SN-Subscriber-Acct-Stop	No	No	No	No	Yes	Yes	No	No
SN-Subscriber-Class	No	No	No	No	Yes	Yes	No	No
SN-Subscriber-Dormant-Activity	No	No	No	No	Yes	Yes	No	No
SN-Subscriber-IP-Hdr-Neg-Mode	No	No	No	No	Yes	Yes	No	No
SN-Subscriber-IP-TOS-Copy	No	No	No	No	Yes	Yes	No	No
SN-Subscriber-Nexthop-Address	No	No	No	No	Yes	Yes	No	No
SN-Subscriber-No-Interims	No	No	No	No	Yes	Yes	No	No
SN-Subscriber-Permission	No	No	No	No	Yes	Yes	No	No
SN-Subscriber-Template-Name	No	No	No	No	Yes	Yes	No	No
SN-Subs-IMSA-Service-Name	No	No	No	No	Yes	Yes	No	No
SN-Subs-VJ-Slotid-Cmp-Neg-Mode	No	No	No	No	Yes	Yes	No	No
SN-Terminating-IOI	No	No	No	No	Yes	Yes	No	No
SN-Tp-Dnlk-Burst-Size	No	No	No	No	Yes	Yes	No	No
SN-Tp-Dnlk-Committed-Data-Rate	No	No	No	No	Yes	Yes	No	No
SN-Tp-Dnlk-Exceed-Action	No	No	No	No	Yes	Yes	No	No
SN-Tp-Dnlk-Peak-Data-Rate	No	No	No	No	Yes	Yes	No	No
SN-Tp-Dnlk-Violate-Action	No	No	No	No	Yes	Yes	No	No
SN-TPO-Policy	No	No	No	No	Yes	Yes	No	No
SN-Tp-Uplk-Burst-Size	No	No	No	No	Yes	Yes	No	No
SN-Tp-Uplk-Committed-Data-Rate	No	No	No	No	Yes	Yes	No	No
SN-Tp-Uplk-Exceed-Action	No	No	No	No	Yes	Yes	No	No
SN-Tp-Uplk-Peak-Data-Rate	No	No	No	No	Yes	Yes	No	No
SN-Tp-Uplk-Violate-Action	No	No	No	No	Yes	Yes	No	No
SN-Traffic-Group	No	No	No	No	Yes	Yes	No	No
SN-TrafficSelector-Class	No	No	No	No	Yes	Yes	No	No
SN-Transparent-Data	No	No	No	No	Yes	Yes	No	No
SN-Tun-Addr-Policy	No	No	No	No	Yes	Yes	No	No
SN-Tunnel-Gn	No	No	No	No	Yes	Yes	No	No
SN-Tunnel-ISAKMP-Crypto-Map	No	No	No	No	Yes	Yes	No	No
SN-Tunnel-ISAKMP-Secret	No	No	No	No	Yes	Yes	No	No
SN-Tunnel-Load-Balancing	No	No	No	No	Yes	Yes	No	No
SN-Tunnel-Password	No	No	No	No	Yes	Yes	No	No
SN-Unclassify-List-Name	No	No	No	No	Yes	Yes	No	No
SN-Virtual-APN-Name	No	No	No	No	Yes	Yes	No	No
SN-Visiting-Behavior	No	No	No	No	Yes	Yes	No	No
SN-Visiting-Profile	No	No	No	No	Yes	Yes	No	No
SN-Visiting-Sub-Use-GGSN	No	No	No	No	Yes	Yes	No	No
SN-Voice-Push-List-Name	No	No	No	No	Yes	Yes	No	No
SN-VPN-ID	No	No	No	No	Yes	Yes	No	No
SN-VPN-Name	No	No	No	No	Yes	Yes	No	No
SN-WiMAX-Auth-Only	No	No	No	No	Yes	Yes	No	No
State	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Attribute	standard	3gpp	3gpp2	3gpp2-835	starent	starent-835	starent-vsa1	starent-vsa1-835
Terminal-Capability	No	No	No	No	No	No	No	No
Termination-Action	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tunnel-Assignment-ID	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tunnel-Client-Auth-ID	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tunnel-Client-Endpoint	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tunnel-Medium-Type	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tunnel-Password	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tunnel-Preference	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tunnel-Private-Group-ID	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tunnel-Server-Auth-ID	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tunnel-Server-Endpoint	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tunnel-Type	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
User-Name	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
User-Password	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
White-List	No	No	No	No	Yes	Yes	Yes	Yes
WiMAX-Acct-Input-Packets-Giga	No	No	No	No	Yes	No	Yes	No
WiMAX-Acct-Output-Packets-Giga	No	No	No	No	Yes	No	Yes	No
WiMAX-Active-Time	No	No	No	No	Yes	No	Yes	No
WiMAX-Beginning-Of-Session	No	No	No	No	Yes	No	Yes	No
WiMAX-BS-ID	No	No	No	No	Yes	No	Yes	No
WiMAX-Capability	No	No	No	No	Yes	No	Yes	No
WiMAX-Control-Octets-In	No	No	No	No	Yes	No	Yes	No
WiMAX-Control-Octets-Out	No	No	No	No	Yes	No	Yes	No
WiMAX-Control-Packets-In	No	No	No	No	Yes	No	Yes	No
WiMAX-Control-Packets-Out	No	No	No	No	Yes	No	Yes	No
WiMAX-Count-Type	No	No	No	No	Yes	No	Yes	No
WiMAX-Device-Auth-Indicator	No	No	No	No	Yes	No	Yes	No
WiMAX-Flow-Description	No	No	No	No	Yes	No	Yes	No
WiMAX-Home-HNP-PMIP6	No	No	No	No	Yes	No	Yes	No
WiMAX-Home-IPv4-HoA-PMIP6	No	No	No	No	Yes	No	Yes	No
WiMAX-Idle-Mode-Transition	No	No	No	No	Yes	No	Yes	No
WiMAX-IP-TechNology	No	No	No	No	Yes	No	Yes	No
WiMAX-NAP-ID	No	No	No	No	Yes	No	Yes	No
WiMAX-NSP-ID	No	No	No	No	Yes	No	Yes	No
WiMAX-Packet-Flow-Descriptor	No	No	No	No	Yes	No	Yes	No
WiMAX-Packet-Flow-Descriptor-V2	No	No	No	No	Yes	No	Yes	No
WiMAX-PDF-ID	No	No	No	No	Yes	No	Yes	No
WiMAX-PPAC	No	No	No	No	Yes	No	Yes	No
WiMAX-PPAQ	No	No	No	No	Yes	No	Yes	No
WiMAX-Prepaid-Indicator	No	No	No	No	Yes	No	Yes	No
WiMAX-Prepaid-Tariff-Switch	No	No	No	No	Yes	No	Yes	No
WiMAX-QoS-Descriptor	No	No	No	No	Yes	No	Yes	No
WiMAX-SDF-ID	No	No	No	No	Yes	No	Yes	No
WiMAX-Session-Continue	No	No	No	No	Yes	No	Yes	No
WiMAX-Session-Term-Capability	No	No	No	No	Yes	No	Yes	No
Win-Call-Id	No	No	No	No	No	No	No	No
Win-Service-Name	No	No	No	No	No	No	No	No
WSType	No	No	No	No	No	No	No	No