

DIAMETER Applications in Telecommunications

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1 Introduction

A first tutorial proposed by EFORT has presented the DIAMETER base protocol. A second tutorial has described the DIAMETER signaling network with the concept of agent as the DIAMETER router in this network. This tutorial lists the DIAMETER applications related to telecommunications, particularly those used in EPS (Evolved Packet System), IMS (IP Multimedia Subsystem), PCC (Policy and Charging Control) and GAA/GBA (Generic Authentication Architecture / Generic Bootstrapping Architecture).

The 4G network also called EPS (Evolved Packet System) is an all IP network. It consists of an access network called LTE (Long Term Evolution) and a new packet switched core network called ePC (Evolved Packet Core). All AAA (Authentication, Authorization and Accounting) procedures in EPS are DIAMETER based.

In 4G, IP-based services proposed by the service provider including telephony services will rely on IMS (IP Multimedia Subsystem). IMS is also an all IP architecture with DIAMETER as the AAA protocol.

Mobile service providers need to control the usage of mobile data to limit the bandwidth available to its heaviest users (fair use), to accept/block/downgrade IP service flows (e.g., downgrade the skype flow). Furthermore, the service provider should enhance the QoS for its proposed IP-based services that need that QoS (e.g., Voice over IP, Mobile TV), etc. The architecture which enables the control of IP service flows (accept, block, downgrade the QoS, enhance the QoS) and enables the charging of these IP service flows is PCC (Policy and Charging Control). All the interfaces of the PCC architecture are DIAMETER-based since PCC is about authorization and Accounting.

GAA/GBA enables service-based mobile authentication, independently of access-based or network-based mobile authentication. The service authentication procedure uses DIAMETER interfaces.

There are other telecommunications architectures which use DIAMETER and which are not presented in this tutorial, such as M2M; M2M uses DIAMETER applications called Tsp, S6m, T4, etc.

More than 80 DIAMETER applications have already been defined for telecommunications, particularly by 3GPP.

2 DIAMETER Applications

3GPP defines a number of applications based on DIAMETER protocol. These applications are also named interfaces.

Thoses related to the EPS architecture are (Figures 1, 2 and 3) :

- S6a (EPS) : S6a interface enables transfer of subscription and authentication data for authenticating / authorizing user access to the evolved packet system (EPS). This interface is between MME (Mobility Management Entity) and HSS (Home Subscriber Server).
- S6d (EPS) : S6d enables the transfer of subscriber related data between the S4-SGSN and the HSS.
- S13 (EPS) : S13 is an interface between the MME and the EIR (Equipment Identity Register) in EPS. It allows validating the IMEI status.

- S13' (EPS) : S13' is an interface between the S4-SGSN and the EIR, which provides an identical service to S13.
- SWx (EPS) : The SWx interface is defined between the HSS and the 3GPP AAA server for non-3GPP access (e.g., WiFi) to EPS and is similar to S6.
- SWm (EPS) : The SWm interface is defined between the ePDG (Evolved Packet Data Gateway) and the 3GPP AAA server or between the ePDG and the 3GPP AAA proxy for non-trusted non-3GPP access to EPS.
- Sta (EPS) : The STa interface is defined between the trusted non-3GPP IP access called TWAN (Trusted Wireless Access Network) to EPS and the 3GPP AAA server in the non-roaming case. In the roaming case it is defined between the TWAN and the 3GPP AAA proxy.
- SWa (EPS) : The SWa interface is defined between the non-trusted non-3GPP IP access and the 3GPP AAA server (non-roaming case) or 3GPP AAA proxy (roaming case). The SWa interface is used for 3GPP-based access authentication and authorization with a non-trusted non-3GPP access. It also supports reporting of accounting information generated by the access network.
- SWd (EPS) : The SWd interface is defined between the 3GPP AAA proxy and the 3GPP AAA server. The SWd interface is used in roaming scenarios where the 3GPP AAA proxy is located in the visited network and the 3GPP AAA server is located in the home network. The 3GPP AAA proxy acts as a Diameter proxy agent and forwards Diameter commands between the Diameter client and the Diameter server.
- S6b (EPS) : The S6b interface is defined between the PDN GW and the 3GPP AAA server (for non-roaming case, or roaming with home routed traffic to PDN GW in home network) and between the PDN GW and the 3GPP AAA proxy (for roaming case with PDN GW in the visited network, i.e. local breakout).
- SLg (EPS) : SLg is an interface which enables the GMLC obtaining UE location information from MME.
- Lgd (EPS) : SLg is an interface which enables the GMLC obtaining UE location information from SGSN.
- SLh (EPS) : SLh is an interface which enables the GMLC obtaining UE location information from HSS.

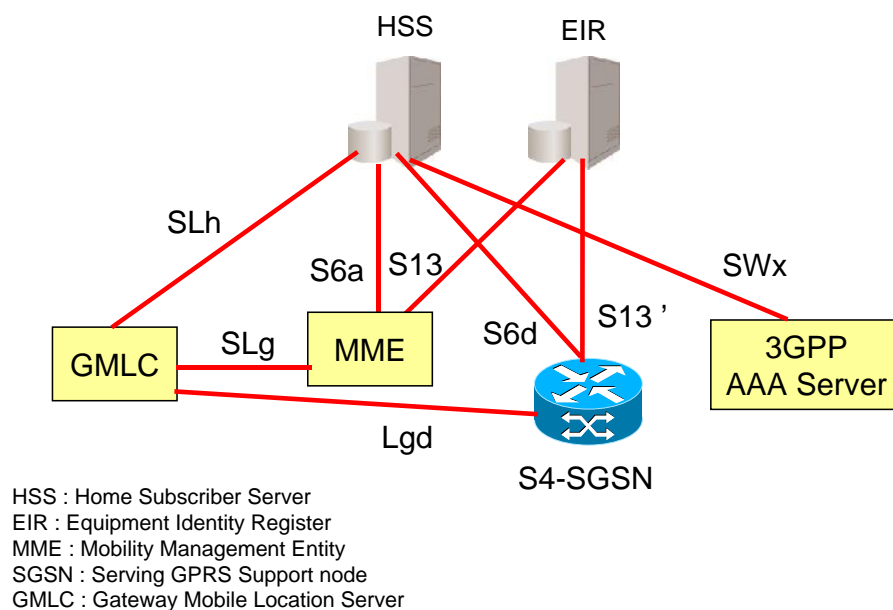


Figure 1 : DIAMETER Interfaces in EPS Architecture

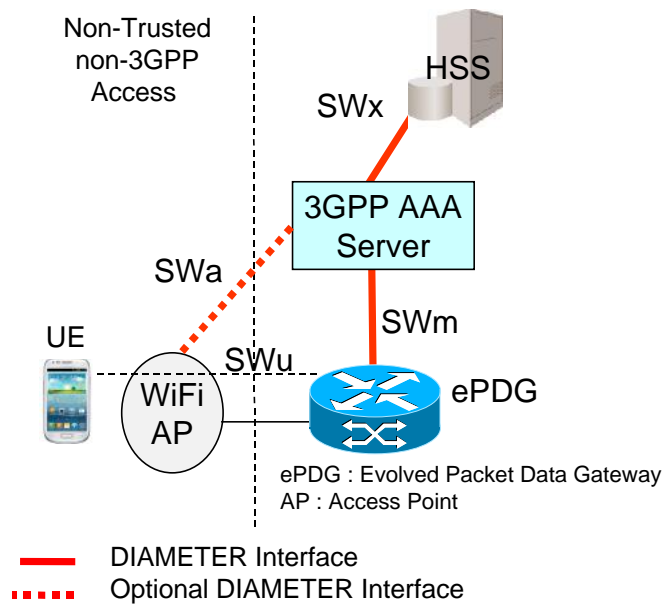


Figure 2 : DIAMETER Interfaces for non-trusted non-3GPP access to EPS

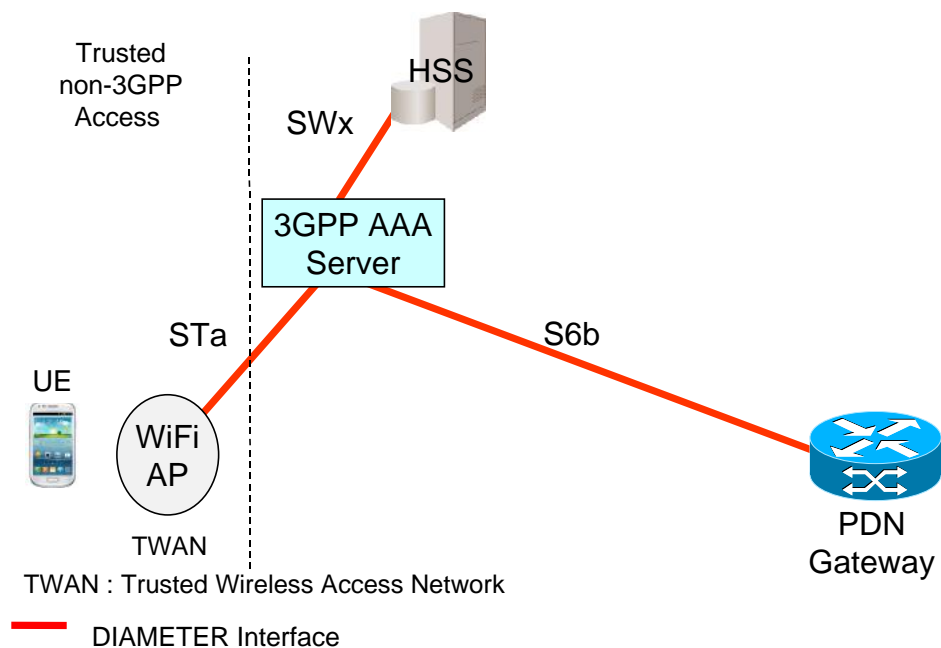


Figure 3 : DIAMETER Interfaces for trusted non-3GPP access to EPS

Those related to PCC architecture are (Figure 4) :

- Gx (GPRS/EPS) : The Gx interface is located between the Policy and Charging Rules Function (PCRF) and the Policy and Charging Enforcement Function (PCEF). PCEF may be embedded in a GGSN or PDN GW. The Gx interface is used for provisioning and removal of PCC (Policy and Charging Control) rules from the PCRF to the PCEF and the transmission of traffic plane events from the PCEF to the PCRF. The Gx interface can also be used for application's traffic detection and control.

- Gxx (EPS) : Gxx is used when the protocol for bearer control is PMIP instead of GTPv2-C. In this case, the access element (e.g., ePDG, TWAN, Serving GW, etc) embeds a Bearer Binding and Event Reporting Function (BBERF). The Gxx interface is located between the PCRF and the BBERF. The Gxx interface is used for provisioning, update and removal of QoS rules from the PCRF to the BBERF and transmission of traffic plane events from the BBERF to the PCRF.
- Sd (EPS) : The Sd interface is between the PCRF and the TDF (Traffic Detection Function) and is used for application's traffic detection and control.
- Gy (GPRS/EPS) : The Gy interface resides between the OCS and the PCEF (e.g., GGSN, PDN GW) and allows online credit control for service data flow based charging. The PCEF obtains credits from OCS via this interface.
- Gz (GPRS/EPS) : The Gz interface resides between the PCEF and the OFCS and enables transport of service data flow based offline charging information. PCEF submits CDRs via Gz to OFCS.
- S9 (EPS) : In the roaming case, a PCRF in the home network controls the policies to be applied. This is done via a PCRF in the visited network over the S9 interface which hence is a roaming interface between PCRFs.
- Rx (EPS) : Rx interface is between the PCRF and the AF (e.g., P-CSCF in case of IMS), for transport of application level session information from the AF to the PCRF and delivery of IP bearer events in the opposite direction.
- Rf (IMS) : Rf is the interface between IMS entities and CDF (Charge Data Function) for offline charging.
- Ro (IMS) : Ro is the interface between IMS entities and Online Charging System (OCS) for online charging.
- Rc (IMS) : The Rc interface allows the interaction between the Online Charging Function (OCF) and the Account Balance Management Function (ABMF) to access the subscribers account balance.
- Re (IMS) : The Re interface allows the interaction between the Online Charging Function (OCF) and the Rating Function (RF) to rate the service the user wants to access to.
- Sp (GPRS/EPS) : Sp is the interface between the PCRF and the SPR (Subscription Profile Repository) to enable the PCRF obtaining subscription information required for PCC rules generation.
- Sy (GPRS/EPS): Sy is used between the PCRF and the OCS to enable transport of indications about charging related events from the OCS to the PCRF.

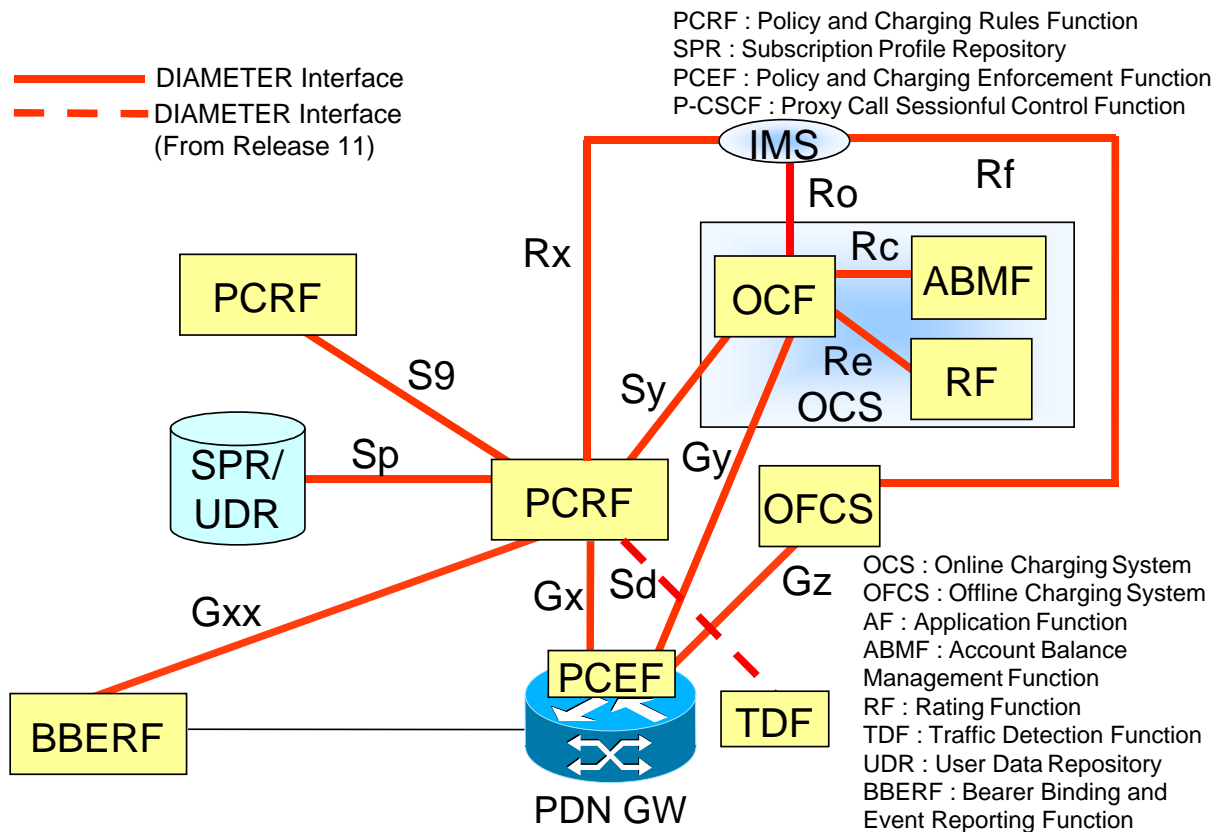


Figure 4 : DIAMETER Interfaces in PCC Architecture

Those related to the IMS architecture are (Figure 5) :

Cx (IMS) : IMS Subscriber and service data are permanently stored in the HSS. These centralized data need to be utilized by the I-CSCF and the S-CSCF when the user registers or receives sessions. Therefore, there has to be an interface between the HSS and the I-CSCF or S-CSCF. Is the Cx interface. The procedures can be divided into three main categories: location management, user data handling and user authentication.

Dx (IMS) : When multiple and separately addressable HSSs have been deployed in a network, neither the I-CSCF nor the S-CSCF know which HSS they need to contact. However, they need to contact the SLF first. For this purpose the Dx interface has been introduced. The Dx interface is always used in conjunction with the Cx interface. Its functionality is implemented by means of the routing mechanism provided by an Diameter redirect agent. To get an HSS address the I-CSCF or the S-CSCF sends to the SLF the Cx requests aimed for the HSS. On receipt of the HSS address from the SLF (DIAMETER answer with a Redirect-Host AVP indicating the address of the target HSS), the I-CSCF or the S-CSCF will send the Cx requests to the HSS.

Sh (IMS) : An AS may need service data. This type of information may be stored in the HSS. Therefore, there has to be an interface between the HSS and the AS. This is the Sh interface. Procedures are divided into two main categories: data handling and subscription/notification.

Dh (IMS) : When multiple and separately addressable HSSs have been deployed in the network, the AS cannot know which HSS it needs to contact. However, the AS needs to contact the SLF first. For this purpose the Dh interface was introduced. To get an HSS address, the AS sends to the SLF the Sh request aimed for the HSS. On receipt of the HSS address from the SLF, the AS will send the Sh request to the HSS.

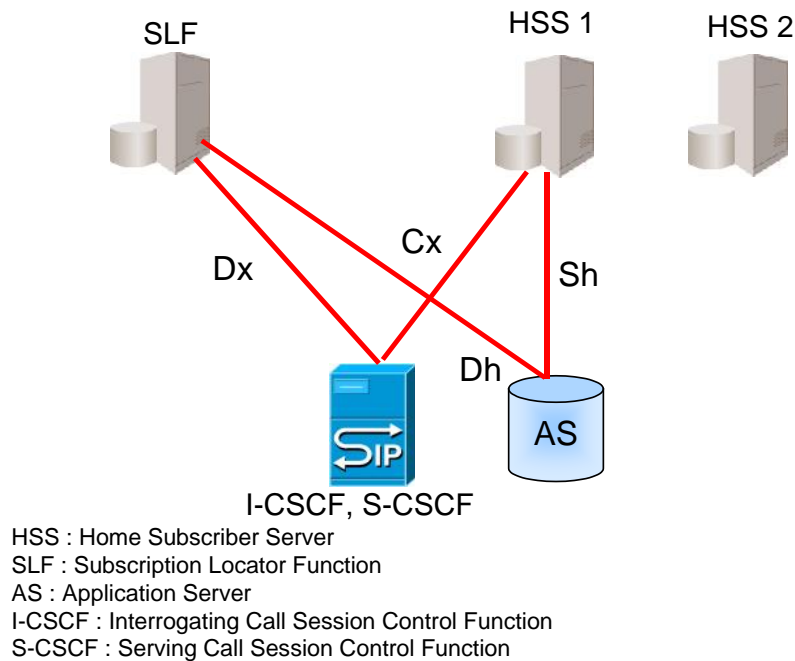


Figure 5 : DIAMETER Interfaces in IMS Architecture

Those related to GAA/GBA are :

- **Zh (GAA/GBA)** : The Bootstrapping Zh interface allows the The Bootstrapping Server Function (BSF) performing the retrieval of an authentication vector and possibly GBA User Security Settings from the HSS.
- **Dz (GAA/GBA)** : When multiple and separately addressable HSSs have been deployed in the network, the BSF cannot know which HSS it needs to contact. However, the BSF needs to contact the SLF first. For this purpose the Dz interface was introduced. To get an HSS address, the BSF sends to the SLF the Zh request aimed for the HSS. On receipt of the HSS address from the SLF, the BSF will send the Zh request to the HSS.
- **Zn (GAA/GBA)** : Zn interface allows Network Application Function (NAF) retrieving the key material and possibly user security settings data from BSF after UE is authenticated with the BSF, every time the UE wants to interact with an NAF.

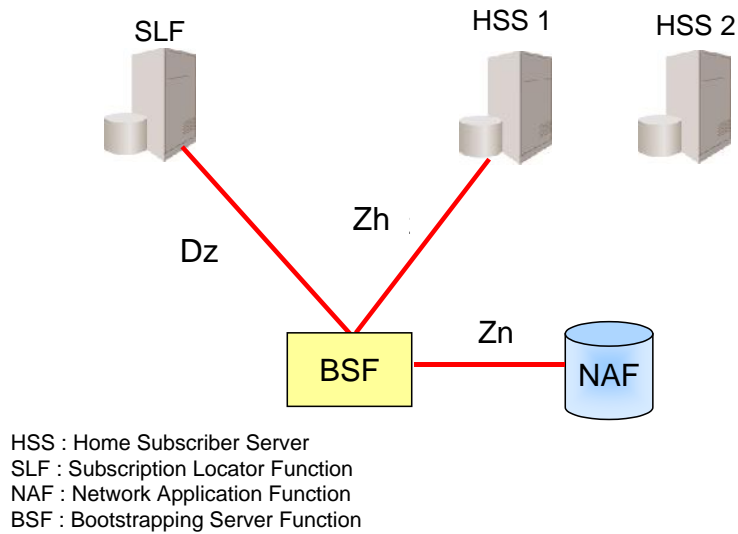


Figure 6 : DIAMETER Interfaces in GAA/GBA Architecture

3 Recommendations related to DIAMETER applications

This chapter lists the interfaces presented earlier and identifies the recommendations which specify them.

3.1 Recommendations related to EPS interfaces

- S6a interface between MME and HSS is defined in 3GPP TS 29.272.
- S6d interface between S4-SGSN and HSS is specified in 3GPP TS 29.272.
- S13 interface between MME and HSS is standardized in 3GPP TS 29.272.
- S13' interface between S4-SGSN and HSS is presented in 3GPP TS 29.272.
- SWx interface between 3GPP AAA Server and HSS is specified in 3GPP TS 29.273
- SWm interface between ePDG and 3GPP AAA Server is standardized in 3GPP TS 29.273
- STa interface between Trusted non-3GPP WAN (TWAN) and 3GPP AAA Server is defined in 3GPP TS 29.273.
- SWa interface between non-trusted non-3GPP WAN and 3GPP AAA Server is specified in 3GPP TS 29.273.
- SWd interface between 3GPP Proxy and 3GPP AAA Server is described in 3GPP TS 29.273.
- S6b interface between PDN GW and 3GPP AAA Server is defined in 3GPP TS 29.273.
- SLg location based interface between GMLC and MME is specified in 3GPP TS 29.172.
- Lgd location based interface between GMLC and SGSN is standardized in 3GPP TS 29.172.
- SLh location based interface between GMLC and HSS is described in 3GPP TS 29.173.

3.2 Recommendations related to Policy and Charging Control (PCC) interfaces

- Gx interface PCRF and PCEF is specified in 3GPP TS 29.212.
- Gxx(*) (Gxa, Gxb, Gxc) interfaces between PCRF and BBERF are defined in 3GPP TS 29.212.
- Sd interface between PCRF and TDF is described in 3GPP TS 29.212.
- Rx interface between P-CSCF (AF) and PCRF is specified in 3GPP TS 29.214.
- S9 interface between vPCRF and hPCRF is described in 3GPP TS 29.215.
- Sp interface PCRF and SPR (not specified yet) is often emulated by the Sh interface standardized in 3GPP TS 29.328.
- Gy interface between PCEF and OCS is described in 3GPP TS 32.299.
- Gz interface between PCEF and OFCS is presented in 3GPP TS 32.299.
- Rc interface between OCS and ABMF is specified in 3GPP TS 32.296.
- Re interface between OCS and RF is standardized 3GPP TS 32.296.
- Sy interface between OCS and PCRF is specified in 3GPP TS 29.219.
- Ro interface between IMS-GWF or AS/MRFC and OCS is standardized in 3GPP TS.
- Rf interface between IMS entities (i.e., P-CSCF, I-CSCF, S-CSCF, MRFC, AS, MGCF, BCGF) and CDF is defined in 3GPP TS.

3.3 Recommendations related to IMS interfaces

- Cx interface between I-CSCF or S-CSCF and HSS is described in 3GPP TS 29.228 and 29.229.
- Dx interface between I-CSCF or S-CSCF and SLF is described in dans 3GPP TS 29.228 and 29.229.
- Sh interface between AS and HSS is defined in 3GPP TS 29.328 and 29.329.
- Dh interface between AS and SLF is defined in 3GPP TS 29.328 and 29.329.

3.4 Recommendations related to GAA/GBA interfaces

- Zh interface between BSF and HSS is standardized in 3GPP TS 29.109.
- Dz interface between BSF and SLF is presented in 3GPP TS 29.109.
- Zn interface between NAF and BSF is defined in 3GPP TS 29.109.

4 Commands associated to the DIAMETER Applications

This chapter describes the commands associated to each DIAMETER application.

4.1 EPS Applications

S6a/S6d (Application Identifier = 16777251)

Request sent by MME/S4-SGSN to HSS : Update-Location-Request (ULR)

Answer returned by HSS to MME/S4-SGSN : Update-Location-Answer (ULA)

Request sent by MME/S4-SGSN to HSS : Purge-UE-Request (PUR)

Answer returned by HSS to MME/S4-SGSN : Purge-UE-Answer (PUA)

Request sent by MME/S4-SGSN to HSS : Authentication-Information-Request (AIR)

Answer returned by HSS to MME/S4-SGSN : Authentication-Information-Answer (AIA)

Request sent by HSS to MME/S4-SGSN: Cancel-Location-Request (CLR)

Answer returned by MME/S4-SGSN to HSS : Cancel-Location-Answer (CLA)
Request sent by HSS to MME/S4-SGSN: Insert-Subscriber-Data-Request (IDR)
Answer returned by MME/S4-SGSN to HSS : Insert-Subscriber-Data-Answer (IDA)
Request sent by HSS to MME/S4-SGSN: Delete-Subscriber-Data-Request (IDR)
Answer returned by MME/S4-SGSN to HSS : Delete-Subscriber-Data-Answer (IDA)
Request sent by HSS to MME/S4-SGSN: Reset-Request (RSR)
Answer returned by MME/S4-SGSN to HSS : Reset-Answer (RSA)
Request sent by MME/S4-SGSN to HSS : Notify-Request (NOR)
Answer returned by HSS to MME/S4-SGSN : Notify-Answer (NOA)

S13/S13' (Application Identifier = 16777252)

Request sent by MME/S4-SGSN à l'EIR: ME-Identity-Check-Request (ECR)
Answer returned by l'EIR to MME/S4-SGSN : ME-Identity-Check-Answer (ECA)

SWm (Application Identifier = 16777264)

Request sent by ePDG to 3GPP AAA Server : Diameter-EAP-Request (DER)
Answer returned by 3GPP AAA Server to ePDG : Diameter-EAP-Answer (DEA)
Request sent by ePDG to 3GPP AAA Server : Authenticate-Authorize-Request (AAR)
Answer returned by 3GPP AAA Server to ePDG : Authenticate-Authorize-Answer (AAA)
Request sent by 3GPP AAA Server to ePDG: Abort-Session-Request (ASR)
Answer returned by ePDG to 3GPP AAA Server : Abort-Session-Answer (AAA)
Request sent by 3GPP AAA Server to ePDG: Re-Auth-Request (RAR)
Answer returned by ePDG to 3GPP AAA Server : Re-Auth-Answer (RAA)

STa (Application Identifier = 16777250)

Request sent by TWAN to 3GPP AAA Server : Diameter-EAP-Request (DER)
Answer returned by 3GPP AAA Server to TWAN : Diameter-EAP-Answer (DEA)
Request sent by TWAN to 3GPP AAA Server : AA-Request (AAR)
Answer returned by 3GPP AAA Server to TWAN : AA-Answer (AAA)
Request sent by 3GPP AAA Server to TWAN: Abort-Session-Request (ASR)
Answer returned by TWAN to 3GPP AAA Server : Abort-Session-Answer (AAA)
Request sent by 3GPP AAA Server to TWAN: Re-Auth-Request (RAR)
Answer returned by le TWAN to 3GPP AAA Server : Re-Auth-Answer (RAA)
Request sent by TWAN to 3GPP AAA Server : Session-Termination-Request (STR)
Answer returned by 3GPP AAA Server to TWAN : Session-Termination-Answer (STA)

SWx (Application Identifier = 16777265)

Request sent by 3GPP AAA Server to HSS : Server-Assignment-Request (SAR)
Answer returned by HSS to 3GPP AAA Server : Server-Assignment-Answer (SAA)
Request sent by HSS to 3GPP AAA Server : Registration-Termination-Request (RTR)
Answer returned by 3GPP AAA Server to HSS : Registration-Termination-Answer (RTA)
Request sent by HSS to 3GPP AAA Server : Push-Profile-Request (PPR)
Answer returned by 3GPP AAA Server to HSS : Push-Profile-Answer (PPA)
Request sent by 3GPP AAA Server to HSS : Multimedia-Authentication-Request (MAR)
Answer returned by HSS to 3GPP AAA Server : Multimedia-Authentication-Answer (MAA)

SLh (Application Identifier = 16777291)

Request sent by GMLC to HSS : LCS-Routing-Info-Request (RIR)
Answer returned by HSS to GMLC : LCS-Routing-Info-Answer (RIA)

SLg/Lgd (Application Identifier = 16777255)

Request sent by GMLC to MME/SGSN : Provide-Location-Request (PLR)
Answer returned by MME/SGSN to GMLC : Provide-Location-Answer (PLA)
Request sent by MME/SGSN to GMLC : Location-Report-Request (LRR)
Answer returned by GMLC to MME/SGSN : Location-Report-Answer (LRA)

S6b (Application Identifier = 16777272)

Request sent by PDN GW to 3GPP AAA Server/Proxy : AA-Request (AAR)
Answer returned by 3GPP AAA Server/Proxy to PDN GW : AA-Answer (AAA)
Request sent by PGW to 3GPP AAA Server/Proxy: Session-Termination-Request (STR)
Answer returned by 3GPP AAA Server/Proxy to PGW: Session-Termination-Answer (STA)
Request sent by 3GPP AAA Server/Proxy to PDN GW: Abort-Session-Request (ASR)
Answer returned by PDN GW to 3GPP AAA Server/Proxy : Abort-Session-Answer (AAA)
Request sent by 3GPP AAA Server/Proxy to PDN GW: Re-Auth-Request (RAR)
Answer returned by PDN GW to 3GPP AAA Server/Proxy : Re-Auth-Answer (RAA)

4.2 PCC Applications

Gx (Application Identifier = 16777238)

Request sent by PCEF to PCRF : Credit-Control-Request (CCR)
Answer returned by PCRF to PCEF : Credit-Control-Answer (CCA)
Request sent by PCRF to PCEF : Re-Auth-Request (RAR)
Answer returned by PCEF to PCRF : Re-Auth-Answer (RAA)

Gxx (Application Identifier = 16777266)

Request sent by BBERF to PCRF : Credit-Control-Request (CCR)
Answer returned by PCRF à la BBERF : Credit-Control-Answer (CCA)
Request sent by PCRF à la BBERF : Re-Auth-Request (RAR)
Answer returned by la BBERF to PCRF : Re-Auth-Answer (RAA)

Sd (Application Identifier = 16777303)

Request sent by PCRF to TDF : TDF-Session-Request (TSR)
Answer returned by TDF to PCRF : TDF-Session-Answer(TSA)
Request sent by TDF to PCRF : Credit-Control-Request (CCR)
Answer returned by PCRF to TDF : Credit-Control-Answer (CCA)
Request sent by PCRF to TDF : Re-Auth-Request (RAR)
Answer returned by TDF to PCRF : Re-Auth-Answer (RAA)

Gy/Ro (Application Identifier = 4)

Request sent by PCEF to OCS : Credit-Control-Request (CCR)
Answer returned by OCS to PCEF : Credit-Control-Answer (CCA)
Request sent by OCS to PCEF : Re-Auth-Request (RAR)
Answer returned by PCEF to OCS : Re-Auth-Answer (RAA)

Gz/Rf (Application Identifier = 3)

Request sent by PCEF to OFCS : Accounting-Request (ACR)
Answer returned by OFCS to PCEF : Accounting-Answer (ACA)

S9 (Application Identifier = 16777267)

Request sent by visited PCRF to home PCRF : Credit-Control-Request (CCR)
Answer returned by home PCRF to visited PCRF : Credit-Control-Answer (CCA)
Request sent by home PCRF to visited PCRF : Re-Auth-Request (RAR)
Answer returned by visited PCRF to home PCRF : Re-Auth-Answer (RAA)

Rc (Application Identifier = 4)

Request sent by OCS to ABMF : Credit-Control-Request (CCR)
Answer returned by ABMF to OCS : Credit-Control-Answer (CCA)
Request sent by ABMF to OCS : Re-Auth-Request (RAR)
Answer returned by OCS to ABMF : Re-Auth-Answer (RAA)

Re (Application Identifier = 16777218)

Request sent by OCS to RF : Price-Request
Answer returned by RF to OCS : Price-Answer
Request sent by OCS to RF : Tariff-Request
Answer returned by RF to OCS : Tariff-Answer (RAA)

Rx (Application Identifier = 16777236)

Request sent by AF to PCRF : Authenticate and Authorize Request (AAR)
Answer returned by PCRF to AF : Authenticate and Authorize Answer (AAA)
Request sent by PCRF to AF : Re-Auth-Request (RAR)
Answer returned by AF to PCRF : Re-Auth-Answer (RAA)
Request sent by AF to PCRF : Session Termination Request (STR)
Answer returned by PCRF to AF : Session Termination Answer (STA)
Request sent by PCRF to AF : Abort-Session-Request (ASR)
Answer returned by AF to PCRF : Abort-Session-Answer (ASA)

Sy (Application Identifier = 16777302)

Request sent by PCRF to OCS : Spending-Limit-Request (SLR)
Answer returned by OCS to PCRF : Spending-Limit-Answer (SLA)
Request sent by OCS to PCRF : Spending-Status-Notification-Request (SNR)
Answer returned by PCRF to OCS : Spending-Status-Notification-Answer (SNA)
Request sent by PCRF to OCS : Session-Termination-Request (STR)
Answer returned by OCS to PCRF : Session-Termination-Answer (STA)

4.3 IMS Applications

Cx/Dx (Application Identifier = 16777216)

Request sent by S-CSCF to HSS : Server-Assignment-Request (SAR)
Answer returned by HSS to S-CSCF : Server-Assignment-Answer (SAA)
Request sent by HSS to S-CSCF : Registration-Termination-Request (RTR)
Answer returned by S-CSCF to HSS : Registration-Termination-Answer (RTA)
Request sent by HSS to S-CSCF : Push-Profile-Request (PPR)
Answer returned by S-CSCF to HSS : Push-Profile-Answer (PPA)
Request sent by S-CSCF to HSS : Multimedia-Authentication-Request (MAR)
Answer returned by HSS to S-CSCF : Multimedia-Authentication-Answer (MAA)
Request sent by I-CSCF to HSS : User-Authorization-Request (UAR)
Answer returned by HSS to I-CSCF : User-Authorization-Answer (UAA)
Request sent by I-CSCF to HSS : Location-Information-Request (LIR)
Answer returned by HSS to I-CSCF : Location-Information-Answer (LIA)

Sh/Dh (Application Identifier = 16777217)

Request sent by AS to HSS : User-Data-Request (UDR)
Answer returned by HSS to AS : User-Data-Answer (UDA)
Request sent by AS to HSS : Profile-Update-Request (UDR)
Answer returned by HSS to AS : Profile-Update-Answer (UDA)
Request sent by AS to HSS : Subscribe-Notifications-Request (SNR).
Answer returned by HSS to AS : Subscribe-Notifications-Answer (SNA)
Request sent by HSS to AS : Push-Notification-Request (PNR)
Answer returned by AS to HSS : Push-Notification-Answer (PNA)

4.4 GAA/GBA Applications

Zh (Application Identifier = 16777221)

Request sent by BSF to HSS : Multimedia-Authentication-Request (MAR)

Answer returned by HSS to BSF : Multimedia-Authentication-Answer (MAA)

Zn (Application Identifier = 16777220)

Request sent by NAF to BSF : Bootstrapping-Information-Request (BIR)

Answer returned by BSF to NAF : Bootstrapping-Information-Answer (BIA)