様式第17の4（第23条の9の3関係）

接続約款設定（変更）届出書

[redacted]

令和７年 12 月 24 日

総務大臣　殿

郵便番号　１００－６１５０
（ふりがな）　とうきょうとちよだくながたちょう
住　　所　東京都千代田区永田町２－１１－１
（ふりがな）　かぶしきがいしゃえぬ・てぃ・てぃ・どこも
氏　　名　株式会社ＮＴＴドコモ
代表取締役社長　前田　義晃
登録年月日　平成１６年４月１日
登録番号　第７４号
連絡先　[redacted]

電気通信事業法第 34 条第２項の規定により、別紙のとおり接続約款を変更するので届け出ます。

実　施　期　日	令和７年１２月３１日

注１　用紙の大きさは、日本産業規格Ａ列４番とすること。

添付資料

別紙　接続約款新旧対照表
別紙　技術的条件集新旧対照表
別紙　別表 14 直接協定事業者 HSS 接続用インタフェース仕様
別紙　別表 15 直接協定事業者 SMSC 接続用インタフェース仕様
別紙　接続会計に基づく令和 6 年度算定接続料と令和 5 年度届出の令和 6 年度適用予測接続料との比較
様式第１７の４の２
様式第１７の４の３
様式第１７の４の４
様式第１７の４の５
様式第１７の４の６
様式第１７の４の７
様式第１７の４の８
様式第１７の４の９
様式第１７の４の１０
令和３年総務省告示第４１０号に基づく様式第１・２（Ｒ６用）

接続約款新旧対照表（本則・附則）（2025/12/31 改正）

新

（用語の定義）

第３条　この約款においては、次表の左欄の用語はそれぞれ右欄の意味で使用します。

用　語	意　味
45　直収パケット交換機	当社の契約者が指定する移動無線装置と協定事業者の電気通信設備とのパケット通信に係る接続経路の設定を行うために設置する当社が指定する交換設備
45-2　移動管理装置	当社と協定事業者の利用者情報の管理・認証に必要な設備との間で利用者の移動管理等を行うために設置する当社の移動管理設備

（標準的な接続箇所）

第５条　当社の指定電気通信設備と他事業者の電気通信設備との標準的な接続箇所は次のとおりとします。

標準的な接続箇所	内　容
(１)～(4) 略	略
(5) 移動管理装置のルータ	移動管理装置に接続されたルータと接続される他事業者の電気通信設備の当社側端子

旧

（用語の定義）

第３条　この約款においては、次表の左欄の用語はそれぞれ右欄の意味で使用します。

用　語	意　味
45　直収パケット交換機	当社の契約者が指定する移動無線装置と協定事業者の電気通信設備とのパケット通信に係る接続経路の設定を行うために設置する当社が指定する交換設備

（標準的な接続箇所）

第５条　当社の指定電気通信設備と他事業者の電気通信設備との標準的な接続箇所は次のとおりとします。

標準的な接続箇所	内　容
(１)～(4) 略	略

接続約款新旧対照表（本則・附則）（2025/12/31 改正）

新	旧
（接続により提供する機能の休廃止の円滑な実施） 第９条の２　別表１（接続により提供する機能）の１－１（基本接続機能）に規定する機能のうち、第二種指定電気通信設備接続料規則（平成28年総務省令第31号。以下、「接続料規則」といいます。）第４条に定める法定機能（以下、「法定機能」といいます。）に該当する機能又はＵＳＩＭカードの機能を休廃止しようとするときは、当社は当該機能を利用する協定事業者に対して、機能を休廃止する３年前までにその情報を対面等説明（事業法施行規則第23条の９の７第１項に定める説明をいいます。以下、この条において同じとします。）により提供するものとし、法定機能に該当しない機能を休廃止しようとするときは、当該機能を利用する協定事業者に対して、機能を休廃止する１年前までにその情報を対面等説明により提供するものとします。（併せて、代替措置の提案等、他の電気通信事業者が必要な対応を行うための措置の実施についても行うこととします。） ２　前項に規定する法定機能に該当する機能又はＵＳＩＭカードの機能の休廃止に関する情報を当該機能を利用する協定事業者に提供し、その協定事業者と協議が調った場合は、前項の規定にかかわらず、情報の提供から３年未満で当社は当該機能を休廃止することがあります。また、前項に規定する法定機能に該当しない機能の休廃止に関する情報を当該機能を利用する協定事業者に提供し、その協定事業者と協議が調った場合は、前項の規定にかかわらず、情報の提供から１年未満で当社は当該機能を休廃止することがあります。 ３　当社が休廃止する予定の機能について、接続申込者から当該機能を新たに利用する旨の意思表示があったときは、当社は速やかに当該機能の休廃止に係る情報を対面等説明により提供します。この場合において、当社は接続申込者との協定の締結又は変更をもって、事業法第34条の２に定める周知を行ったこととします。 ４　前３項の規定にかかわらず、当該機能を現に利用する協定事業者がいない場合は、当社は速やかに当該機能を休廃止することがあります。	（接続により提供する機能の休廃止の円滑な実施） 第９条の２　別表１（接続により提供する機能）の１－１（基本接続機能）に規定する機能を休廃止しようとするときは、当社は当該機能を利用する協定事業者に対して、機能を休廃止する１年前までにその情報を対面等説明（事業法施行規則第23条の９の７第１項に定める説明をいいます。以下、この条において同じとします。）により提供するものとします。（併せて、代替措置の提案等、他の電気通信事業者が必要な対応を行うための措置の実施についても行うこととします。） ２　前項に規定する機能の休廃止に関する情報を当該機能を利用する協定事業者に提供し、その協定事業者と協議が調った場合は、前項の規定にかかわらず、情報の提供から１年未満で当社は当該機能を休廃止することがあります。 ３　当社が休廃止する予定の機能について、接続申込者から当該機能を新たに利用する旨の意思表示があったときは、当社は速やかに当該機能の休廃止に係る情報を対面等説明により提供します。この場合において、当社は接続申込者との協定の締結又は変更をもって、事業法第34条の２に定める周知を行ったこととします。 ４　前３項の規定にかかわらず、当該機能を現に利用する協定事業者がいない場合は、当社は速やかに当該機能を休廃止することがあります。

接続約款新旧対照表（本則・附則）（2025/12/31 改正）

新	旧
（料金等） 第51条　当社が設定する接続料は、料金及び工事又は手続きに関する費用とします。 ２　当社が設定する料金は、料金表第１表（接続料金）に規定する接続料金とし、網使用料及び網改造料とします。 ３　当社が設定する接続において必要となる工事又は手続きに関する費用は、料金表第２表（工事費及び手続費）に規定する工事費又は手続費とします。 ４　前３項に規定する料金及び費用のほか、当社は電話ユニバーサルサービス料、ＵＳＩＭカードの貸与に係る費用、業務支援システムの利用及び電話リレーサービス料に係る費用を設定します。	（料金等） 第51条　当社が設定する接続料は、料金及び工事又は手続きに関する費用とします。 ２　当社が設定する料金は、料金表第１表（接続料金）に規定する接続料金とし、網使用料及び網改造料とします。 ３　当社が設定する接続において必要となる工事又は手続きに関する費用は、料金表第２表（工事費及び手続費）に規定する工事費又は手続費とします。 ４　前３項に規定する料金及び費用のほか、当社はユニバーサルサービス料、ＵＳＩＭカードの貸与に係る費用、業務支援システムの利用及び電話リレーサービス料に係る費用を設定します。
（電話ユニバーサルサービス料の支払義務） 第56条の２　協定事業者は、第53条の２（定額制の網使用料の支払義務）第１項の規定に基づき別表１（接続により提供する機能）１－１（基本接続機能）に規定するＦＯＭＡ特定接続契約者回線管理機能、Ｘｉ特定接続契約者回線管理機能、５Ｇ特定接続契約者回線管理機能、ＦＯＭＡ特定接続契約者（音声）回線管理機能、Ｘｉ特定接続契約者（音声）回線管理機能又は５Ｇ特定接続契約者（音声）回線管理機能の支払いを要する場合には、当社に対して電話ユニバーサルサービス料の支払いを要します。ただし、番号規則別表第3号に定める電気通信番号を用いる場合は、この限りではありません。 ２　前項の場合において、協定事業者が支払いを要する電話ユニバーサルサービス料の料金額は、ＦＯＭＡサービス契約約款、Ｘｉサービス契約約款又は５Ｇサービス契約約款に規定する電話ユニバーサルサービス料に相当する額とします。 ３　第１項の場合において、支払義務に関する取扱いは、第53条の２（定額制の網使用料の支払義務）第２項及び第３項を準用することとし、同条第２項中「定額制の網使用料」とあるのは、「電話ユニバーサルサービス料」と読み替えるものとします。	（ユニバーサルサービス料の支払義務） 第56条の２　協定事業者は、第53条の２（定額制の網使用料の支払義務）第１項の規定に基づき別表１（接続により提供する機能）１－１（基本接続機能）に規定するＦＯＭＡ特定接続契約者回線管理機能、Ｘｉ特定接続契約者回線管理機能、５Ｇ特定接続契約者回線管理機能、ＦＯＭＡ特定接続契約者（音声）回線管理機能、Ｘｉ特定接続契約者（音声）回線管理機能又は５Ｇ特定接続契約者（音声）回線管理機能の支払いを要する場合には、当社に対してユニバーサルサービス料の支払いを要します。ただし、番号規則別表第3号に定める電気通信番号を用いる場合は、この限りではありません。 ２　前項の場合において、協定事業者が支払いを要するユニバーサルサービス料の料金額は、ＦＯＭＡサービス契約約款、Ｘｉサービス契約約款又は５Ｇサービス契約約款に規定するユニバーサルサービス料に相当する額とします。 ３　第１項の場合において、支払義務に関する取扱いは、第53条の２（定額制の網使用料の支払義務）第２項及び第３項を準用することとし、同条第２項中「定額制の網使用料」とあるのは、「ユニバーサルサービス料」と読み替えるものとします。
（従量制の網使用料等の支払義務）	（従量制の網使用料等の支払義務）

接続約款新旧対照表（本則・附則）（2025/12/31 改正）

新	旧
第53条　当社の指定電気通信設備との接続において従量制の網使用料（網使用料のうち月額で定める料金（以下、「定額制の網使用料」といいます。）以外のものをいいます。以下、同じとします。）又は網改造料（この条において、料金表第１表（接続料金）第２（網改造料）１（適用）１－１（網改造料の対象となる機能）第３欄に係る料金をいいます。）（以下、従量制の網使用料と網改造料をあわせて「従量制の網使用料等」といいます。）の支払いを要する協定事業者は、第44条（接続形態）に規定する接続形態ごとに、別表２（接続形態）第４表（網使用料支払事業者）に規定するところによります。 ２　前項の規定により支払いを要することとなる協定事業者は、相互接続通信において利用する第52条（接続料金の区分）に規定する機能ごとに、第57条（従量制の網使用料等の計算方法）の規定に基づいて算定した従量制の網使用料等を支払うことを要します。 ３　協定事業者は、従量制の網使用料等について、当社の機器の故障等により正しく算定することができなかった場合は、次の方法により算定した料金を支払うこととします。この場合において、特別の事情があるときは、当社は協定事業者と協議するものとします。 (1) 協定事業者が通信時間若しくは通信回数、又は通信量を記録している場合 協定事業者の記録する通信時間若しくは通信回数と料金表第１表（接続料金）第１（網使用料）２（料金額）第１欄から第５欄又は第15欄イ欄に規定する料金額に基づいて算定した額、又は協定事業者の記録する通信量と料金表第１表（接続料金）第１（網使用料）２（料金額）第15欄ア欄及びウ欄に規定する料金額に基づいて算定した額 (2) (1)以外の場合 把握可能な実績（機器の故障等により正しく算定することができなかった日の初日（初日が確定できないときにあっては、種々の事情を総合的に判断して機器の故障等があったと認められる日）の属する暦月（毎月初日の午前０時から末日の午後12時までの期間とします。）の前12暦月を最長として、その間の通信時間若しくは通信回数、又は通信量の累計をいいます。）に基づい	第53条　当社の指定電気通信設備との接続において従量制の網使用料（網使用料のうち月額で定める料金（以下、「定額制の網使用料」といいます。）以外のものをいいます。以下、同じとします。）又は網改造料（この条において、料金表第１表（接続料金）第２（網改造料）１（適用）１－１（網改造料の対象となる機能）第３欄に係る料金をいいます。）（以下、従量制の網使用料と網改造料をあわせて「従量制の網使用料等」といいます。）の支払いを要する協定事業者は、第44条（接続形態）に規定する接続形態ごとに、別表２（接続形態）第４表（網使用料支払事業者）に規定するところによります。 ２　前項の規定により支払いを要することとなる協定事業者は、相互接続通信において利用する第52条（接続料金の区分）に規定する機能ごとに、第57条（従量制の網使用料等の計算方法）の規定に基づいて算定した従量制の網使用料等を支払うことを要します。 ３　協定事業者は、従量制の網使用料等について、当社の機器の故障等により正しく算定することができなかった場合は、次の方法により算定した料金を支払うこととします。この場合において、特別の事情があるときは、当社は協定事業者と協議するものとします。 (1) 協定事業者が通信時間又は通信回数を記録している場合 協定事業者の記録する通信時間又は通信回数と料金表第１表（接続料金）第１（網使用料）２（料金額）第１欄から第５欄に規定する料金額に基づいて算定した額 (2) (1)以外の場合 把握可能な実績（機器の故障等により正しく算定することができなかった日の初日（初日が確定できないときにあっては、種々の事情を総合的に判断して機器の故障等があったと認められる日）の属する暦月（毎月初日の午前０時から末日の午後12時までの期間とします。）の前12暦月を最長として、その間の通信時間又は通信回数の累計をいいます。）に基づいて１日平均の通信時間又は通信回数を算出し、その値に算定できなかった期間の日数を乗じた値と料金表第１表（接続料金）第１（網使用料）２（料金額）第１

接続約款新旧対照表（本則・附則）（2025/12/31 改正）

新	旧
て１日平均の通信時間若しくは通信回数、又は通信量を算出し、その値に算定できなかった期間の日数を乗じた値と料金表第１表（接続料金）第１（網使用料）２（料金額）第１欄から第５欄又は第15欄イ欄に規定する料金額に基づいて算定した額、又は料金表第１表（接続料金）第１（網使用料）２（料金額）第15欄ア欄及びウ欄に規定する料金額に基づいて算定した額	欄から第５欄に規定する料金額に基づいて算定した額
（従量制の網使用料等の計算方法） 第57条　当社は、従量制の網使用料等は暦月に従って、毎月初日の午前０時から末日の午後12時までの間に終了した通信について、次条により測定する通信時間又は通信回数の累積と料金表第１表（接続料金）第１（網使用料）２（料金額）第１欄から第５欄又は第15欄イ欄の規定により計算します。 ２　前項の規定にかかわらず、通信量は暦月に従って、次条により測定する通信量の累積と料金表第１表（接続料金）第１（網使用料）２（料金額）第15欄ア欄及びウ欄の規定により計算します。	（従量制の網使用料等の計算方法） 第57条　当社は、従量制の網使用料等は暦月に従って、毎月初日の午前０時から末日の午後12時までの間に終了した通信について、次条により測定する通信時間又は通信回数の累積と料金表第１表（接続料金）第１（網使用料）２（料金額）第１欄から第５欄の規定により計算します。
（通信時間の測定等） 第58条　通信時間は、当社の電気通信設備が応答信号を受信した時点から起算し、当社の電気通信設備が切断信号を受信した時点までの経過時間とし、当社の機器により測定します。 ２　ショートメッセージ通信モードに係る通信回数は、当社の電気通信設備が移動無線装置から着信完了を示す信号を受信した時点を１回とし、当社の機器により測定します。 ３　前２項及び第４項の規定にかかわらず、次に掲げる通信については、当社は通信時間若しくは通信回数、又は通信量の測定を行いません。 (1) 試験用の通信（当社又は協定事業者の設定した試験番号に係る通信に限ります。） (2) 課金に影響を及ぼす設備故障等に遭遇した通信 ４　通信量は、当社の電気通信設備が受信したデータ（制御信号のうちデータとみなされるものを含みます。）の情報量とし、当社の機器により測定します。	（通信時間の測定等） 第58条　通信時間は、当社の電気通信設備が応答信号を受信した時点から起算し、当社の電気通信設備が切断信号を受信した時点までの経過時間とし、当社の機器により測定します。 ２　ショートメッセージ通信モードに係る通信回数は、当社の電気通信設備が移動無線装置から着信完了を示す信号を受信した時点を１回とし、当社の機器により測定します。 ３　前２項の規定にかかわらず、次に掲げる通信については、当社は通信時間又は通信回数の測定を行いません。 (1) 試験用の通信（当社又は協定事業者の設定した試験番号に係る通信に限ります。） (2) 課金に影響を及ぼす設備故障等に遭遇した通信

接続約款新旧対照表（本則・附則）（2025/12/31 改正）

新	旧
（定額制の網使用料及び網改造料並びに電話ユニバーサルサービス料及び電話リレーサービス料の計算方法） 第59条　当社は、定額制の網使用料及び網改造料並びに電話ユニバーサルサービス料及び電話リレーサービス料は暦月に従って計算します。 ２　当社は、第53条の２（定額制の網使用料の支払義務）第１項若しくは第２項、第54条（網改造料の支払義務）第６項、第56条の２（電話ユニバーサルサービス料の支払義務）第１項及び第３項又は第56条の5（電話リレーサービス料の支払義務）第１項及び第３項の規定に該当するときに限り、定額制の網使用料（特定接続契約者（ＩＭＳ接続）回線管理機能に係る料金を除く）、網改造料、電話ユニバーサルサービス料又は電話リレーサービス料について、その利用した暦日数に応じて日割を行います。この場合において、第53条の２（定額制の網使用料の支払義務）第２項、第54条（網改造料の支払義務）第６項、第56条の２（電話ユニバーサルサービス料の支払義務）第３項及び第56条の５（電話リレーサービス料の支払義務）第3項に規定する料金の算定にあたっては、その日数計算の単位となる24時間をその開始時刻が属する暦日とみなします。 （料金等の支払い） 第60条　協定事業者は、料金等（接続料金、工事費、手続費、割増金、延滞利息、電話ユニバーサルサービス料、ＵＳＩＭカードの貸与に係る費用、業務支援システムの利用及び電話リレーサービス料に係る費用をいいます。以下同じとします。）について、当社が別に定める期日までに、当社が指定する金融機関等において支払うことを要します。 ２　料金等の請求又は支払方法については、当社が協定事業者と協議の上定める料金事務処理確認事項又は個別建設契約、接続用ソフトウェア開発契約若しくはその他の工事に係る契約に規定します。 ただし、第62条のただし書きに規定する料金額の適用が見込まれるときその他料金等の請求又は支払方法について、別段の定めがある場合は、その定めるところによります。	（定額制の網使用料及び網改造料並びにユニバーサルサービス料及び電話リレーサービス料の計算方法） 第59条　当社は、定額制の網使用料及び網改造料並びにユニバーサルサービス料及び電話リレーサービス料は暦月に従って計算します。 ２　当社は、第53条の２（定額制の網使用料の支払義務）第１項若しくは第２項、第54条（網改造料の支払義務）第６項、第56条の２（ユニバーサルサービス料の支払義務）第１項及び第３項又は第56条の5（電話リレーサービス料の支払義務）第１項及び第３項の規定に該当するときに限り、定額制の網使用料、網改造料、ユニバーサルサービス料又は電話リレーサービス料について、その利用した暦日数に応じて日割を行います。この場合において、第53条の２（定額制の網使用料の支払義務）第２項、第54条（網改造料の支払義務）第６項、第56条の２（ユニバーサルサービス料の支払義務）第３項及び第56条の５（電話リレーサービス料の支払義務）第3項に規定する料金の算定にあたっては、その日数計算の単位となる24時間をその開始時刻が属する暦日とみなします。 （料金等の支払い） 第60条　協定事業者は、料金等（接続料金、工事費、手続費、割増金、延滞利息、ユニバーサルサービス料、ＵＳＩＭカードの貸与に係る費用、業務支援システムの利用及び電話リレーサービス料に係る費用をいいます。以下同じとします。）について、当社が別に定める期日までに、当社が指定する金融機関等において支払うことを要します。 ２　料金等の請求又は支払方法については、当社が協定事業者と協議の上定める料金事務処理確認事項又は個別建設契約、接続用ソフトウェア開発契約若しくはその他の工事に係る契約に規定します。 ただし、第62条のただし書きに規定する料金額の適用が見込まれるときその他料金等の請求又は支払方法について、別段の定めがある場合は、その定めるところによります。

接続約款新旧対照表（本則・附則）（2025/12/31 改正）

新

料金表
通則
（消費税相当額の加算）
1　第53条（従量制の網使用料等の支払義務）から第56条の４（業務支援システムの利用に係る費用の支払義務）までの規定その他この約款の規定により料金表に定める料金等の支払いを要するものとされている額は、この料金表に定める額に消費税相当額を加算した額とします。
（料金等の臨時減免）
2　当社は、災害が発生したときは、特定端末系事業者の公衆電話から発信する通信について、第53条（従量制の網使用料等の支払義務）の規定にかかわらず、臨時に、料金表第１表（接続料金）第１（網使用料）２（料金額）第１欄、第２欄、第４欄、第４欄の２ア欄、第５欄及び第15欄ア欄に規定する料金額を減免する場合があります。

第１表　接続料金
第１　網使用料
1　適用

区　分	内　　容
(18)　適用する機能の組み合わせ	ＦＯＭＡ直収パケット接続機能及びＦＯＭＡ特定接続契約者回線管理機能は、第２(網改造料)１－１(網改造料の対象となる機能)表中第４欄、又は同表中第４欄及び第５欄に規定する機能とともに組み合わせて適用されます。また、Ｘｉ直収パケット接続機能及びＸｉ特定接続契約者回線管理機能、５Ｇ直収パケット接続機能及び５Ｇ特定接続契約者回線管理機能は、同表中第４欄、又は同表中第４欄及び第６欄に規定する機能とともに組み合わせて適用されます。

旧

料金表
通則
（消費税相当額の加算）
1　第53条（従量制の網使用料等の支払義務）から第56条の４（業務支援システムの利用に係る費用の支払義務）までの規定その他この約款の規定により料金表に定める料金等の支払いを要するものとされている額は、この料金表に定める額に消費税相当額を加算した額とします。
（料金等の臨時減免）
2　当社は、災害が発生したときは、特定端末系事業者の公衆電話から発信する通信について、第53条（従量制の網使用料等の支払義務）の規定にかかわらず、臨時に、料金表第１表（接続料金）第１（網使用料）２（料金額）第１欄、第２欄、第４欄、第４欄の２及び第５欄に規定する料金額を減免する場合があります。

第１表　接続料金
第１　網使用料
1　適用

区　分	内　　容
(18)　適用する機能の組み合わせ	ＦＯＭＡ直収パケット接続機能及びＦＯＭＡ特定接続契約者回線管理機能は、第２(網改造料)１－１(網改造料の対象となる機能)表中第４欄、又は同表中第４欄及び第５欄に規定する機能とともに組み合わせて適用されます。また、Ｘｉ直収パケット接続機能及びＸｉ特定接続契約者回線管理機能、５Ｇ直収パケット接続機能及び５Ｇ特定接続契約者回線管理機能は、同表中第４欄、又は同表中第４欄及び第６欄に規定する機能とともに組み合わせて適用されます。

接続約款新旧対照表（本則・附則）（2025/12/31 改正）

新

(19) ＩＭＳ接続機能に係る料金の適用	ＩＭＳ接続に係る料金については、２（料金額）(15)の料金額を適用します。
(20)特定接続契約者（ＩＭＳ接続）回線管理機能に係る料金の適用	特定接続契約者（ＩＭＳ接続）回線管理機能に係る料金については、２（料金額）(16)の料金額を適用します。

２　料金額

区　分		単　位	料金額	備考
(14) ５Ｇ特定接続契約者回線課金情報提供機能		１契約者回線ごとに	8円	月額
（15）ＩＭＳ接続機能	ア　通話モード接続機能	1GBごとに	2,662円	—
	イ　ショートメッセージ通信モード接続機能（ＳＭＳinＭＥ）	1通ごとに	0.24853円	—
	ウ　ショートメッセージ通信モード接続機能（ＳＭＳoverＩＰ）	1GBごとに	508円	—
（16）特定接続契約者（ＩＭＳ接続）		1契約者回線ご	25円	月額

旧

２　料金額

区　分	単　位	料金額	備考
(14) ５Ｇ特定接続契約者回線課金情報提供機能	１契約者回線ごとに	8円	月額

接続約款新旧対照表（本則・附則）（2025/12/31 改正）

新

回線管理機能	とに		

第２　網改造料
　１　適用
１－１　網改造料の対象となる機能

区　分		備　考
(1)～(9)略	略	―
(10) Diameterアプリケーション利用機能	第１（網使用料）第２（料金額）表中第15欄に規定する機能を利用するにあたり必要となる当社の電気通信設備と協定事業者の電気通信設備との間の移動管理装置を介した通信の経路設定等の処理を行う機能	―

別表１　接続により提供する機能
　１－１　基本接続機能

区　分	内　容	備　考
削除	――――――	―
ＩＭＳ接続機能	電気通信番号使用計画の認定を受ける仮想携帯電話通信事業者の音声呼の制御に必要な設備（ＩＭＳ又はこれに相当する設備）、ショートメッセージの制御に必要な設備（ＳＭＳＣ又はこれに相当する設備）、及び利用者情報の管理・認証に必要な設備（ＨＳＳ又はこれに相当	―

旧

第２　網改造料
　１　適用
１－１　網改造料の対象となる機能

区　分		備　考
(1)～(9)略	略	―

別表１　接続により提供する機能
　１－１　基本接続機能

区　分	内　容	備　考
削除	――――――	―

新			旧
	する設備)と当社の電気通信設備との間で連携を行う機能		
特定接続契約者（ＩＭＳ接続）回線管理機能	ＩＭＳ接続機能を利用するＸｉ特定接続契約者（ＩＭＳ接続）回線又は５Ｇ特定接続契約者（ＩＭＳ接続）回線に係る情報の管理等を行う機能	一	

接続約款新旧対照表（本則・附則）（2025/12/31 改正）

新

別表２　接続形態

(2)　表の適用

本表において接続形態を次の各号により規定します。

ア　「発信事業者」欄に示す事業者から発信し、「経由事業者」欄に示す事業者（２－２表においては、同一事業者を複数経由する場合も含みます。）を経由して「着信事業者」欄に示す事業者に着信する通信。ただし、該当の事業者が存在しない場合はその欄を空欄とし、右の「着信事業者」欄に示す事業者に着信するものとします。なお、技術的条件集第2章第11節　対移動体事業者（ＳＭＳ）インタフェース、第12節　対移動体事業者（IP）インタフェース、及び第13節　対地域／国際事業者（IP）インタフェースで接続する場合の接続形態は２－３表に規定します。２－３表に規定する発信事業者欄、着信事業者欄、利用者料金設定事業者欄、利用者料金請求事業者欄又は網使用料支払事業者欄において「協定事業者」と記述がある場合には、当社以外の全ての事業者に適用できるものとします（ＩＭＳ接続機能を活用して音声接続等を行う仮想携帯電話通信事業者を含む。）。

イ　各表適用欄においては、左欄の記号はそれぞれ右欄の意味で使用します。

記号	意　味
(a)	第75条（ローミング等に係る特例）に規定する特例を適用する通信
(b)	当社が他社相互接続通信について利用者料金（役務区間単位料金）の課金を行う通信
(c)	協定事業者が相互接続通信について利用者料金（役務区間単位料金）の課金を行う通信
(d)	当社が協定事業者から課金に係る情報を受信し課金を行う通信
(e)	第82条（個別契約事業者に対する契約者情報の提供）の規定に基づき契約者情報の提供が可能な通信
(f)	別表１（接続により提供する機能）１－１（基本接続機能）に規定するＦＯＭＡ直収パケット接続機能、Ｘｉ直収パケット接続機能若しくは５Ｇ直収パケット接続機能に係る通信、又は00XY自動付与機能に係る通信
（ｇ）	別表１（接続により提供する機能）１－１（基本接続機能）に規定するＩＭＳ接続機能に係る通信

別添２のとおり

旧

別表２　接続形態

(2)　表の適用

本表において接続形態を次の各号により規定します。

ア　「発信事業者」欄に示す事業者から発信し、「経由事業者」欄に示す事業者（２－２表においては、同一事業者を複数経由する場合も含みます。）を経由して「着信事業者」欄に示す事業者に着信する通信。ただし、該当の事業者が存在しない場合はその欄を空欄とし、右の「着信事業者」欄に示す事業者に着信するものとします。なお、技術的条件集第2章第13節　対地域／国際事業者（IP）インタフェースで接続する場合の接続形態は２－３表に規定します。２－３表に規定する発信事業者欄、着信事業者欄、利用者料金設定事業者欄、利用者料金請求事業者欄又は網使用料支払事業者欄において「協定事業者」と記述がある場合には、当社以外の全ての事業者に適用できるものとします。

イ　各表適用欄においては、左欄の記号はそれぞれ右欄の意味で使用します。

記号	意　味
(a)	第75条（ローミング等に係る特例）に規定する特例を適用する通信
(b)	当社が他社相互接続通信について利用者料金（役務区間単位料金）の課金を行う通信
(c)	協定事業者が相互接続通信について利用者料金（役務区間単位料金）の課金を行う通信
(d)	当社が協定事業者から課金に係る情報を受信し課金を行う通信
(e)	第82条（個別契約事業者に対する契約者情報の提供）の規定に基づき契約者情報の提供が可能な通信
(f)	別表１（接続により提供する機能）１－１（基本接続機能）に規定するＦＯＭＡ直収パケット接続機能、Ｘｉ直収パケット接続機能若しくは５Ｇ直収パケット接続機能に係る通信又は00XY自動付与機能に係る通信

別添１のとおり

接続約款新旧対照表（本則・附則）（2025/12/31 改正）

<table>
<tr><th>新</th><th>旧</th></tr>
<tr><td>
附　則（令和７年 12 月 16 日経企第 000600002870-01 号）
（実施期日）
１　この改正規定は、令和７年 12 月 31 日から実施します。

附　則（令和７年 12 月 22 日経企第 000600002939-01 号）
（実施期日）
１　この改正規定は、令和７年 12 月 31 日から実施します。

（接続料金の実績に基づく精算）
２　当社は、第 61 条の３（接続料金の実績に基づく精算）及び「接続料算定における費用配賦の見直しについて（要請）（令和６年３月 29 日総基料第 55 号）」に基づき、料金表第１表（接続料金）第１（網使用料）２（料金額）の規定にかかわらず、第６欄、第７欄、第７欄の２、第８欄、第９欄及び第９欄の２に定める料金額について、令和６年度に適用していた料金額と次表に規定する料金額との差額に、令和６年度の需要の実績値を乗じて得た額を、協定事業者と精算します。

<table>
<tr><th colspan="2">区分</th><th>単位</th><th>料金額</th><th>備考</th></tr>
<tr><td rowspan="3">（6）ＦＯＭＡ直収パケット接続機能</td><td rowspan="2">ア　GTP 接続</td><td>（ア）10Mb/s のもの</td><td>128,625 円</td><td>月額</td></tr>
<tr><td>（イ）10Mb/s を超える 1.0Mb/s ごとに</td><td>12,862 円</td><td>月額</td></tr>
<tr><td colspan="4">イ　削除</td></tr>
<tr><td>（7）Ｘｉ直収パケット接続機能</td><td>ア　GTP 接続</td><td>（ア）10Mb/s のもの</td><td>128,625 円</td><td>月額</td></tr>
</table>
</td><td></td></tr>
</table>

接続約款新旧対照表（本則・附則）（2025/12/31 改正）

新					旧
		（イ）10Mb/s を超える 1.0Mb/s ごとに	12,862 円	月額	
	イ 削除				
（7）の２ ５Ｇ直収パケット接続機能	GTP 接続	（ア）10Mb/s のもの	128,625 円	月額	
		（イ）10Mb/s を超える 1.0Mb/s ごとに	12,862 円	月額	
（8）ＦＯＭＡ特定接続契約者回線管理機能		1 契約者回線ごとに	63 円	月額	
（9）Ｘｉ 特定接続契約者回線管理機能		1 契約者回線ごとに	63 円	月額	
（9）の２ ５Ｇ 特定接続契約者回線管理機能		1 契約者回線ごとに	63 円	月額	

【別添１】

２－２：当社以外が利用者料金設定を行う接続形態

NO.	第1表						第2表				第3表				第4表	適用	備考
	発信事業者	経由事業者				着信事業者	利用者料金設定事業者				利用者料金請求事業者				網使用料支払事業者		
	発信	経由				着信	区間Ａ	設定者	区間Ｂ	設定者	区間Ａ	請求者	区間Ｂ	請求者			
A-6-20	当社					MVNO	発信-着信	MVNO			発信-着信	MVNO			MVNO	(f)	

接続約款新旧対照表（本則・附則）（2025/12/31 改正）

【別添２】

２－２：当社以外が利用者料金設定を行う接続形態

NO.	第1表						第2表				第3表				第4表	適用	備考
	発信事業者	経由事業者				着信事業者	利用者料金設定事業者				利用者料金請求事業者				網使用料支払事業者		
	発信	経由				着信	区間Ａ	設定者	区間Ｂ	設定者	区間Ａ	請求者	区間Ｂ	請求者			
A-6-20	当社					MVNO	発信-着信	MVNO			発信-着信	MVNO			MVNO	(f) (g)	

別紙

✓ 当社は、電気通信事業法第 34 条第 2 項に基づく第 2 種指定電気通信設備に係る接続約款(以下、「接続約款」という。)第 61 条の3(接続料金の実績に基づく精算)及び「接続料算定における費用配賦の見直しについて(要請)(令和 6 年 3 月 29 日総基料第 55 号)」に基づき、接続約款料金表第1表(接続料金)第1(網使用料)2(料金額)の規定にかかわらず、第6欄、第7欄、第7欄の2、第8欄、第9欄及び第9欄の2に定める料金額について、令和 6 年度接続会計を基礎として算定するデータ伝送交換機能に係る精算接続料(以降「令和 6 年度算定接続料」)が令和 6 年 2 月に届出を行った令和 6 年度に適用される予測接続料(以降「令和 6 年度適用接続料」)を上回ったことから、令和 6 年度適用接続料を上限値として協定事業者と精算することとします。

【接続会計に基づく令和 6 年度算定接続料と令和 5 年度届出の令和 6 年度適用予測接続料との比較】

表1 回線容量単位の精算接続料

	令和 6 年度算定接続料	令和 6 年度適用接続料
接続料(万円/(10Mbps・月))	134,376	128,625
原価【億円】	9,384	8,530
利潤【億円】	1,072	1,055
需要【Gbps】	6,742	6,466

表2 回線数単位の精算接続料

	令和 6 年度算定接続料	令和 6 年度適用接続料
接続料【円/(回線・月)】	65	63
原価【億円】	594	588
利潤【億円】	98	79
需要【万回線】	8,794	8,820

[1] 令和 6 年度接続会計を基礎として算定したデータ伝送交換機能に係る精算接続料
[2] 費用配賦の見直し適用前の令和 5 年度接続会計に相当するものに基づき合理的に算定するデータ伝送交換機能に係る令和 6 年度適用接続料

接続約款新旧対照表（本則・附則）（2025/12/31改正）

<table>
<tr><th>新</th><th>旧</th></tr>
<tr><td>
第１章　通則
（用語の定義）
第１条　この技術的条件集においては、次表の左欄の用語はそれぞれの右欄の意味で使用します。
<table>
<tr><th>用語</th><th>意味</th></tr>
<tr><td>(1) 形態</td><td>接続インタフェースごとにインタフェース種別を区別した接続条件を指します。</td></tr>
<tr><td>(2)～(31)　（略）</td><td>（略）</td></tr>
</table>
（標準的な接続箇所）
</td><td>
第１章　通則
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<tr><td>(1) 形態</td><td>接続インタフェースごとにインタフェース種別を区別した概念形態ごとの接続条件は第５条(1)、第９条(1)、第46条(1)および第50条(1)を参照</td></tr>
<tr><td>(2)～(31)　（略）</td><td>（略）</td></tr>
</table>
（標準的な接続箇所）
</td></tr>
</table>

接続約款新旧対照表（本則・附則）（2025/12/31改正）

新

第２条　本則に規定する標準的な接続箇所は次のとおりとします。

標準的な接続箇所	技術的条件
(1) 関門交換機の伝送装置	技術的条件集第２章第１節、第２節、第９節、第11節、および第12節第45条、および第13節第49条に規定するところによります。
(2) 削除	削除
(3) 直収パケット交換機のルータ	技術的条件集第２章第６節第20条、第10節第36条に規定するところによります。
(4) 移動管理装置のルータ	技術的条件集第２章第14節第53条、および第15節第57条に規定するところによります。

第２章　形態別技術的条件

旧

第２条　本則に規定する標準的な接続箇所は次のとおりとします。

標準的な接続箇所	技術的条件
(1) 関門交換機の伝送装置	技術的条件集第２章第１節、第２節、第９節、第11節、および第12節第45条、および第13節第49条に規定するところによります。
(2) 削除	削除
(3) 直収パケット交換機のルータ	技術的条件集第２章第６節第20条、第10節第36条に規定するところによります。

第２章　形態別技術的条件

接続約款新旧対照表（本則・附則）（2025/12/31改正）

新	旧
第14節　直接協定事業者HSS接続用インタフェース （網構成） 第53条　当社網と直接協定事業者網間の回線網の構成は次のとおりとします。 (1) 当社のMME及びDEAと直接協定事業者のHSS及びDEAとの接続は、本則の相互接続点の設置場所に定める相互接続点単位に行うものとします。 (2) 当社網と直接協定事業者網は広域イーサネット等を介して接続され、相互接続点は直収パケット交換機に接続されたルータと接続される回線終端装置（直接協定事業者が当社側に設置するもの）の当社側端子とします。なお、当該回線終端装置と直収パケット交換機に接続されたルータ間の接続はイーサネットとします。 （接続方式） 第54条　当社網と直接協定事業者網間での使用する接続方式は、次のとおりとします。 (1) 当社網と直接協定事業者網間はIP接続方式を適用します。 (2) 当社網と直接協定事業者網間の通信経路については冗長化構成をとることができます。 （信号方式） 第55条　当社網と直接協定事業者網間で使用する制御信号方式は、以下のDiameterとします。 (1)制御プロトコルとしてDiameterを使用する。 ア　Diameter仕様は、3GPP TS 29.272に準拠します。Diameterプロトコルは「技術的条件集別表14－１　制御プロトコル仕様」に示すとおりとします。なお、当社網が直接協定事業者網から本プロトコル仕様で規定された以外のメッセージ、パラメータ、パラメータ情報要素を受信した場合、当社は接続に関わる正常性を保証しません。 イ　UDP仕様は、RFC768（User Datagram Protocol）に準拠します。	

接続約款新旧対照表（本則・附則）（2025/12/31改正）

新	旧
ウ　IP仕様は、RFC791(Internet Protocol)に準拠します。 （その他接続に必要な事項） 第56条　当社網と直接協定事業者網間で、その他接続に必要な事項は次のとおりとします。 (1) 電気通信回線設備の新設・増減設単位や、その他の接続に必要な事項のうち細目にわたるものについては当社と直接協定事業者間で別途協議の上、決定することとします。 (2) 直接協定事業者間で実装すべき保守制御（迂回機能、総量規制等）は、当社と直接協定事業者間で別途協議の上、決定することとします。 (3) 当社が準拠する標準規格・バージョンの変更に伴い接続条件における後方互換性が維持されず、直接協定事業者網の設備等に改造又は変更が必要になる場合がありますが、当社は一切の責を負いません。 (4) 緊急呼等の接続の扱いについては協議の上で決定することとします。 第15節　直接協定事業者SMSC接続用インタフェース （網構成） 第57条　当社網と直接協定事業者網間の回線網の構成は次のとおりとします。 (1) 当社のMME及びDEAと直接協定事業者のSMSC及びDEAとの接続は、本則の相互接続点の設置場所に定める相互接続点単位に行うものとします。 (2) 当社網と直接協定事業者網は広域イーサネット等を介して接続され、相互接続点は直収パケット交換機に接続されたルータと接続される回線終端装置（直接協定事業者が当社側に設置するもの）の当社側端子とします。なお、当該回線終端装置と直収パケット交換機に接続されたルータ間の接続はイーサネットとします。 （接続方式） 第58条　当社網と直接協定事業者網間での使用する接続方式は、次のとおりと	

接続約款新旧対照表（本則・附則）（2025/12/31改正）

新	旧
します。 (1) 当社網と直接協定事業者網間はIP接続方式を適用します。 (2) 当社網と直接協定事業者網間の通信経路については冗長化構成をとることができます。 （信号方式） 第59条　当社網と直接協定事業者網間で使用する制御信号方式は、以下のDiameterとします。 (1)制御プロトコルとしてDiameterを使用する。 ア　Diameter仕様は、3GPP TS 29.338に準拠します。Diameterプロトコルは「技術的条件集別表15－１　制御プロトコル仕様」に示すとおりとします。なお、当社網が直接協定事業者網から本プロトコル仕様で規定された以外のメッセージ、パラメータ、パラメータ情報要素を受信した場合、当社は接続に関わる正常性を保証しません。 イ　UDP仕様は、RFC768（User Datagram Protocol）に準拠します。 ウ　IP仕様は、RFC791(Internet Protocol)に準拠します。 （その他接続に必要な事項） 第60条　当社網と直接協定事業者網間で、その他接続に必要な事項は次のとおりとします。 (1) 電気通信回線設備の新設・増減設単位や、その他の接続に必要な事項のうち細目にわたるものについては当社と直接協定事業者間で別途協議の上、決定することとします。 (2) 直接協定事業者間で実装すべき保守制御（迂回機能、総量規制等）は、当社と直接協定事業者間で別途協議の上、決定することとします。 (3) 当社が準拠する標準規格・バージョンの変更に伴い接続条件における後方互換性が維持されず、直接協定事業者網の設備等に改造又は変更が必要になる場合がありますが、当社は一切の責を負いません。	技術的条件集別表

接続約款新旧対照表（本則・附則）（2025/12/31改正）

新	旧
技術的条件集別表 別表10　パケットデータ直収（ＬＴＥ）ユーザインタフェース仕様 2．削除 3．削除 4．削除 5　アクセス制御機能概要(GTPv2-C) 5.1　システム構成 　アクセス制御プロトコルは、直収パケット交換機～直収回線等接続事業者ノードにおいてGTPv2-Cプロトコルを用いてアクセス制御を行うための信号を規定します。アクセス制御は以下の8つの機能で構成されます。 　なお、※を付与したアクセス制御については第14節　直接協定事業者HSS接続用インタフェースを参照しない場合は使用しません。 ・ノード監視処理(Echo Request/Echo Response) ・セッション設定処理(Create Session Request/Create Session Response) ・ベアラ設定処理(Create Bearer Request ※/Create Bearer Response ※) ・ベアラ更新処理(Modify Bearer Request/Modify Bearer Response) ・ベアラ(Dedicated)更新処理(Update Bearer Request ※/Update Bearer Response ※) ・位置情報取得処理(Create Bearer Request ※/Create Bearer Response ※/Update Bearer Request ※/Update Bearer Response ※) ・セッション削除処理(Delete Session Request/Delete Session Response) ・ベアラ切断処理(Delete Bearer Request/Delete Bearer Response/Delete Bearer Command ※/Delete Bearer Failure Indication ※)	別表10　パケットデータ直収（ＬＴＥ）ユーザインタフェース仕様 2．(欠番) 3．(欠番) 4．(欠番) 5　アクセス制御機能概要(GTPv2-C) 5.1　システム構成 　アクセス制御プロトコルは、直収パケット交換機～直収回線等接続事業者ノードにおいてGTPv2-Cプロトコルを用いてアクセス制御を行うための信号を規定します。アクセス制御は以下の5つの機能で構成されます。 ・ノード監視処理(Echo Request/Echo Response) ・セッション設定処理(Create Session Request/Create Session Response) ・ベアラ更新処理(Modify Bearer Request/Modify Bearer Response) ・セッション削除処理(Delete Session Request/Delete Session Response) ・ベアラ切断処理(Delete Bearer Request/Delete Bearer Response)

接続約款新旧対照表（本則・附則）（2025/12/31改正）

新

5.2 コネクション

直収パケット交換機～直収回線等接続事業者ノード間で規定するアクセス制御プロトコルはGTPv2-Cプロトコルを用いるため、下位層にUDPを使用します。そのためコネクションの確立・切断は行いません。

(1) タイマ及びリクエスト送信回数

アクセス制御プロトコルで用いるGTPv2-Cインタフェースのタイマ詳細一覧を表5.2-1に示します。また、GTPv2-Cインタフェースのリクエスト送信回数一覧を表5.2-2に示します。

表5.2-1 タイマ詳細一覧(GTPv2-Cインタフェース)※

名称	概要	タイマ値
Echo Response 待ちタイマ	Echo Request送出時に起動されるタイマ。タイムアウト時にリクエスト回数再送します。	20秒
Create Session Response 待ちタイマ	Create Session Request送出時に起動されるタイマ。タイムアウト時にリクエスト回数再送します。	3秒
Modify Bearer Response 待ちタイマ	Modify Bearer Request送出時に起動されるタイマ。タイムアウト時にリクエスト回数再送します。	3秒
Delete Session Response 待ちタイマ	Delete Session Request送出時に起動されるタイマ。タイムアウト時にリクエスト回数再送します。	3秒
Delete Bearer Request	Delete Bearer Command送出時に起動されるタイマ。タイムアウト時にリクエス	20秒

旧

5.2 コネクション

直収パケット交換機～直収回線等接続事業者ノード間で規定するアクセス制御プロトコルはGTPv2-Cプロトコルを用いるため、下位層にUDPを使用します。そのためコネクションの確立・切断は行いません。

(1) タイマ及びリクエスト送信回数

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表5.2-1 タイマ詳細一覧(GTPv2-Cインタフェース)※

名称	概要	タイマ値
Echo Response 待ちタイマ	Echo Request送出時に起動されるタイマ。タイムアウト時にリクエスト回数再送します。	20秒
Create Session Response 待ちタイマ	Create Session Request送出時に起動されるタイマ。タイムアウト時にリクエスト回数再送します。	3秒
Modify Bearer Response 待ちタイマ	Modify Bearer Request送出時に起動されるタイマ。タイムアウト時にリクエスト回数再送します。	3秒
Delete Session Response 待ちタイマ	Delete Session Request送出時に起動されるタイマ。タイムアウト時にリクエスト回数再送します。	3秒

接続約款新旧対照表（本則・附則）（2025/12/31改正）

新

待ちタイマ	ト回数再送します。	

※　当社直収パケット交換機から直収回線等接続事業者ノードへ信号送出時に設定されるタイマになります。

表5.2-2　リクエスト送信回数一覧(GTPv2-Cインタフェース)※1

名称	概要	回数※2
Echo Request 送信回数	Echo Request送出時の同一ノードに対する送信回数。	6回
Create Session Request 送信回数	Create Session Request送出時の同一ノードに対する送信回数。	3回
Modify Bearer Request 送信回数	Modify Bearer Request送出時の同一ノードに対する送信回数。	3回
Delete Session Request 送信回数	Delete Session Request送出時の同一ノードに対する送信回数。	3回
Delete Bearer Command 送信回数	Delete Bearer Request送出時の同一ノードに対する送信回数。	6回

※1　当社直収パケット交換機から直収回線等接続事業者ノードへ信号送出時に再送される回数になります。
※2　初回送信分を含みます。

5.5　ベアラ設定処理(Create Bearer Request/Create Bearer Response)

旧

※　当社直収パケット交換機から直収回線等接続事業者ノードへ信号送出時に設定されるタイマになります。

表5.2-2　リクエスト送信回数一覧(GTPv2-Cインタフェース)※1

名称	概要	回数※2
Echo Request 送信回数	Echo Request送出時の同一ノードに対する送信回数。	6回
Create Session Request 送信回数	Create Session Request送出時の同一ノードに対する送信回数。	3回
Modify Bearer Request 送信回数	Modify Bearer Request送出時の同一ノードに対する送信回数。	3回
Delete Session Request 送信回数	Delete Session Request送出時の同一ノードに対する送信回数。	3回

※1　当社直収パケット交換機から直収回線等接続事業者ノードへ信号送出時に再送される回数になります。
※2　初回送信分を含みます。

接続約款新旧対照表（本則・附則）（2025/12/31改正）

<table>
<tr><th>新</th><th>旧</th></tr>
<tr><td>

(1) 処理概要
接続中のセッションに対してベアラを追加する場合、直収回線等接続事業者ノードから直収パケット交換機に対し、Create Bearer Requestを送信します。直収パケット交換機は、直収回線等接続事業者ノードに対しCreate Bearer Responseを返送します。

(2) ベアラ設定処理対象信号
直収パケット交換機～直収回線等接続事業者ノード間で使用するベアラ設定処理対象信号を表5.5-1に示します。
表5.5-1 ベアラ設定処理対象信号

<table>
<tr><th>制御信号</th><th colspan="3">方向</th></tr>
<tr><td>Create Bearer Request</td><td>直収パケット交換機</td><td>←</td><td>直収回線等接続事業者ノード</td></tr>
<tr><td>Create Bearer Response</td><td>直収パケット交換機</td><td>→</td><td>直収回線等接続事業者ノード</td></tr>
</table>

5.6 ベアラ更新処理(Modify Bearer Request/Modify Bearer Response)

5.7 ベアラ(Dedicated)更新処理(Update Bearer Request/Update Bearer Response)
(1) 処理概要
直収回線等接続事業者ノードよりQoS情報の更新を要求する場合、直収回線等接続事業者ノードより直収パケット交換機に対してUpdate Bearer Requestを送信します。Update Bearer Requestを受信した直収パケット交換機は、直収回線等接続事業者ノードに対し、Update Bearer Responseを送信します。

</td><td>

5.5 ベアラ更新処理(Modify Bearer Request/Modify Bearer Response)

</td></tr>
</table>

接続約款新旧対照表（本則・附則）（2025/12/31改正）

新	旧

(2) 位置情報取得処理対象信号

直収パケット交換機～直収回線等接続事業者ノード間で使用する位置情報取得処理対象信号を表5.7-1に示します。

表5.7-1 位置情報取得処理対象信号

制御信号	方向		
Update Bearer Request	直収パケット交換機	←	直収回線等接続事業者ノード
Update Bearer Response	直収パケット交換機	→	直収回線等接続事業者ノード

5.8 位置情報取得処理(Create Bearer Request/Create Bearer Response/Update Bearer Request/Update Bearer Response)

(1) 処理概要

直収回線等接続事業者ノードより位置情報取得(NetLoc)を要求する場合、直収回線等接続事業者ノードより直収パケット交換機に対してCreate Bearer Request又はUpdate Bearer Requestを送信します。Create Bearer Request/Update Bearer Requestを受信した直収パケット交換機は、必要な処理を実施し、直収回線等接続事業者ノードに対し、Create Bearer Response/Update Bearer Responseを送信します。

(2) 位置情報取得処理対象信号

直収パケット交換機～直収回線等接続事業者ノード間で使用する位置情報取得処理対象信号を表5.8-1に示します。

表5.8-1 位置情報取得処理対象信号

接続約款新旧対照表（本則・附則）（2025/12/31改正）

新

制御信号	方向		
Create Bearer Request	直収パケット交換機	←	直収回線等接続事業者ノード
Create Bearer Response	直収パケット交換機	→	直収回線等接続事業者ノード
Update Bearer Request	直収パケット交換機	←	直収回線等接続事業者ノード
Update Bearer Response	直収パケット交換機	→	直収回線等接続事業者ノード

5.9　セッション削除処理(Delete Session Request/Delete Session Response)

(1)～(2)　（略）

(3) セッション削除処理対象信号

直収パケット交換機～直収回線等接続事業者ノード間で使用するセッション削除処理対象信号を表5.9-1に示します。

表5.9-1　セッション削除処理対象信号

制御信号	方向		
Delete Session Request	直収パケット交換機	→	直収回線等接続事業者ノード
Delete Session Response	直収パケット交換機	←	直収回線等接続事業者ノード

5.10　ベアラ切断処理(Delete Bearer Request/Delete Bearer

旧

5.6　セッション削除処理(Delete Session Request/Delete Session Response)

(1)～(2)　（略）

(3) セッション削除処理対象信号

直収パケット交換機～直収回線等接続事業者ノード間で使用するセッション削除処理対象信号を表5.6-1に示します。

表5.6-1　セッション削除処理対象信号

制御信号	方向		
Delete Session Request	直収パケット交換機	→	直収回線等接続事業者ノード
Delete Session Response	直収パケット交換機	←	直収回線等接続事業者ノード

接続約款新旧対照表（本則・附則）（2025/12/31改正）

<table>
<tr><th>新</th><th>旧</th></tr>
<tr><td>
Response/Delete Bearer Command/Delete Bearer Failure Indication)
(1) 処理概要
直収回線等接続事業者ノードより接続終了を要求する場合、直収回線等接続事業者ノードより直収パケット交換機に対してDelete Bearer Requestを送信します。Delete Bearer Requestを受信した直収パケット交換機は、切断に必要な処理を実施し、直収回線等接続事業者ノードに対し、Delete Bearer Responseを送信します。
特定のベアラの接続終了を要求する場合、直収パケット交換機から直収回線等接続事業者ノードに対してDelete Bearer Commandを送信します。Delete Bearer Commandが失敗した場合、直収回線等接続事業者ノードより直収パケット交換機に対してDelete Bearer Failure Indicationを送信します。

(2) タイムアウト時の処理
表5.2-2標記の回数送信します。リトライアウト後は、送信を停止し移動無線装置との間のベアラを切断します。

(3) 接続終了処理対象信号
直収パケット交換機～直収回線等接続事業者ノード間で使用するベアラ切断処理対象信号を表5.10-1に示します。

表5.10-1 ベアラ切断処理対象信号
<table>
<tr><th>制御信号</th><th colspan="3">方向</th></tr>
<tr><td>Delete Bearer Request</td><td>直収パケット交換機</td><td>←</td><td>直収回線等接続事業者ノード</td></tr>
<tr><td>Delete Bearer</td><td>直収パケット交換機</td><td>→</td><td>直収回線等接続事業者ノ</td></tr>
</table>
</td><td>
5.7 ベアラ切断処理(Delete Bearer Request/Delete Bearer Response)
(1) 処理概要
直収回線等接続事業者ノードより接続終了を要求する場合、直収回線等接続事業者ノードより直収パケット交換機に対してDelete Bearer Requestを送信します。Delete Bearer Requestを受信した直収パケット交換機は、切断に必要な処理を実施し、直収回線等接続事業者ノードに対し、Delete Bearer Responseを送信します。

(2) 接続終了処理対象信号
直収パケット交換機～直収回線等接続事業者ノード間で使用するベアラ切断処理対象信号を表5.7-1に示します。

表5.7-1 ベアラ切断処理対象信号
<table>
<tr><th>制御信号</th><th colspan="3">方向</th></tr>
<tr><td>Delete Bearer</td><td>直収パケット交換機</td><td>←</td><td>直収回線等接続事業者ノ</td></tr>
</table>
</td></tr>
</table>

接続約款新旧対照表（本則・附則）（2025/12/31改正）

新				旧			
Response			ード	Request			ード
Delete Bearer Command	直収パケット交換機	←	直収回線等接続事業者ノード	Delete Bearer Response	直収パケット交換機	→	直収回線等接続事業者ノード
Delete Bearer Failure Indication	直収パケット交換機	→	直収回線等接続事業者ノード				

5.11　IPアドレス払い出し処理

5.11.1　IPv4アドレス払い出し処理
　DTEへのIPv4アドレスの払い出しは、セッション設定処理時に行われます。直収回線等接続事業者ノードが任意にIPアドレスを指定し払い出しを実施します。

5.11.2　IPv6アドレス払い出し処理
　DTEへのIPv6アドレスの払い出しは、セッション設定処理時に行われます。IPv6アドレスのうち64bitのInterface-IdはDTE側で任意に設定することになります。直収回線等接続事業者ノードが任意にIPv6 Prefixを指定し払い出しを実施します。

5.11.3　IPv4/IPv6アドレス払い出し処理
　IPv4とIPv6を同時に払い出す場合は、5.11.1，5.11.2のそれぞれに従います。

6．GTPv2-Cパケット

6.1　GTPv2-Cパケット構成

5.8　IPアドレス払い出し処理

5.8.1　IPv4アドレス払い出し処理
　DTEへのIPv4アドレスの払い出しは、セッション設定処理時に行われます。直収回線等接続事業者ノードが任意にIPアドレスを指定し払い出しを実施します。

5.8.2　IPv6アドレス払い出し処理
　DTEへのIPv6アドレスの払い出しは、セッション設定処理時に行われます。IPv6アドレスのうち64bitのInterface-IdはDTE側で任意に設定することになります。直収回線等接続事業者ノードが任意にIPv6 Prefixを指定し払い出しを実施します。

5.8.3　IPv4/IPv6アドレス払い出し処理
　IPv4とIPv6を同時に払い出す場合は、5.8.1，5.8.2のそれぞれに従います。

6．GTPv2-Cパケット

接続約款新旧対照表（本則・附則）（2025/12/31改正）

新

GTPv2-C パケットは、Version、Protocol Type、TEID flag、MP(Message Priority flag)、Message Type、Message Length、TEID、Sequence Number、Message Priorityからなる共通部分と、信号毎に異なるパラメータを設定する情報要素部分から構成されます。

GTPv2-Cパケットの構成及びGTPv2-Cパケットの構成要素概要を図6.1-1及び表6.1-1に示します。

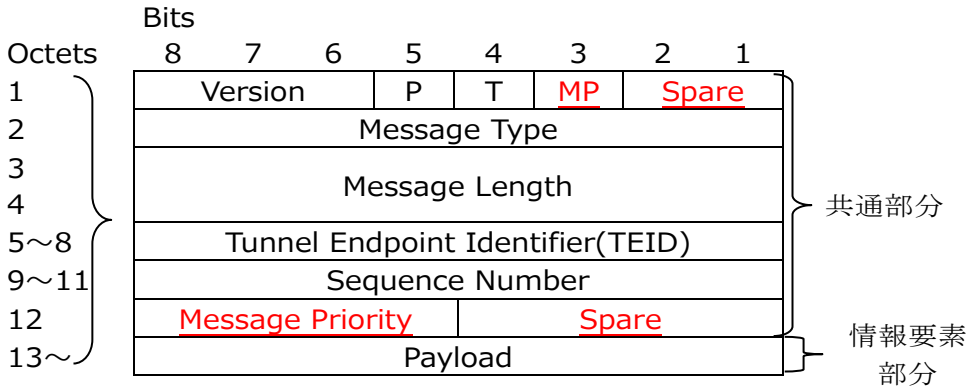

図6.1-1　GTPv2-Cパケットの構成

表6.1-1　GTPv2-Cパケットの構成要素概要

項番	情報要素	参照	情報長	内容
1	Version	6.1.1	3bits	GTPのバージョンを示します
2	P(Piggybacking flag)	6.1.2	1bit	Piggybacking有無を示します
3	T(TEID flag)	6.1.3	1bit	TEIDの設定有無を示します
4	MP(Message Priority flag)	6.1.4	1bit	Message Priorityの有無を示します。

旧

6.1　GTPv2-Cパケット構成

GTPv2-Cパケットは、Version、Protocol Type、TEID flag、Message Type、Message Length、TEID、Sequence Numberからなる共通部分と、信号毎に異なるパラメータを設定する情報要素部分から構成されます。

GTPv2-Cパケットの構成及びGTPv2-Cパケットの構成要素概要を図6.1-1及び表6.1-1に示します。

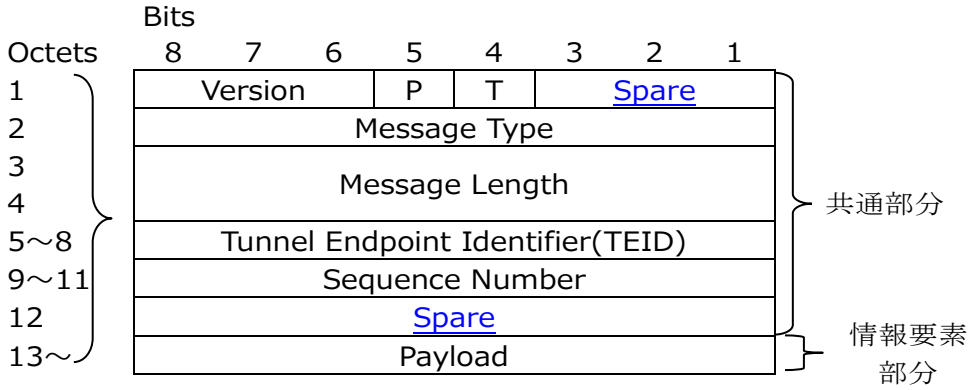

図6.1-1　GTPv2-Cパケットの構成

表6.1-1　GTPv2-Cパケットの構成要素概要

項番	情報要素	参照	情報長	内容
1	Version	6.1.1	3bits	GTPのバージョンを示します
2	P(Piggybacking flag)	6.1.2	1bit	Piggybacking有無を示します
3	T(TEID flag)	6.1.3	1bit	TEIDの設定有無を示します

接続約款新旧対照表（本則・附則）（2025/12/31改正）

新

5	Spare	-	3bits	予約領域０を設定します
6	Message Type	6.1.4	1octet	GTPのメッセージ種別を示します
7	Message Length	6.1.5	2octets	Payload部の情報長を示します
8	TEID	6.1.6	4octets	回線接続時に払い出される回線を識別する番号になります。T(TEID flag)が1の場合のみ設定します。
9	Sequence Number	6.1.7	3octets	GTPv2-C の Request と Responseを対応させるトランザクションIDとして使用されます
10	Message Priority	6.1.9	4bits	メッセージの優先度を示します。
11	Payload	6.1.8	-	各GTPv2-Cメッセージ個別のパラメータ設定に使用します

6.1.1 Version(バージョン)

直収パケット交換機と直収回線等接続事業者ノードで使用されるGTPのバージョンを示します。GTP verion2 のみ使用いたします。Version設定値を表6.1.1-1に示します。

表6.1.1-1 Version設定値の説明

bit	8	7	6	意味	備考
	0	0	0	GTP version 0	未使用
	0	0	1	GTP version 1	未使用
	0	1	0	GTP version 2	使用

旧

4	Spare	-	3bits	予約領域０を設定します
5	Message Type	6.1.4	1octet	GTPのメッセージ種別を示します
6	Message Length	6.1.5	2octets	Payload部の情報長を示します
7	TEID	6.1.6	4octets	回線接続時に払い出される回線を識別する番号になります。T(TEID flag)が1の場合のみ設定します。
8	Sequence Number	6.1.7	3octets	GTPv2-C の Request と Responseを対応させるトランザクションIDとして使用されます
9	Payload	6.1.8	-	各GTPv2-Cメッセージ個別のパラメータ設定に使用します

6.1.1 Version(バージョン)

直収パケット交換機と直収回線等接続事業者ノードで使用されるGTPのバージョンを示します。GTP verion2 のみ使用いたします。Version設定値を表6.1.1-1に示します。

表6.1.1-1 Version設定値の説明

bit	8	7	6	情報長	備考
	0	0	0	GTP version 0	未使用
	0	0	1	GTP version 1	未使用

接続約款新旧対照表（本則・附則）（2025/12/31改正）

新

6.1.2 P(Piggybacking flag)

直収パケット交換機と直収回線等接続事業者ノードで使用されるGTPのプロトコルでのPiggybacking有無を示します。0(Piggybacking無)のみ使用いたします。P(Piggybacking flag)設定値を表6.1.2-1に示します。

表6.1.2-1 P(Piggybacking flag)設定値の説明

bit	5	意味	備考
	0	Piggybacking無	使用
	1	Piggybacking有	未使用

6.1.3 T(TEID flag)

TEIDの存在有無を示します。直収パケット交換機と直収回線等接続事業者ノード間では、Echo Request、Echo ResponseとVersion Not Supported IndicationメッセージのGTPv2-Cメッセージヘッダには TEIDフィールドを設定いたしません。T(TEID flag)設定値を表6.1.3-1に示します。

表6.1.3-1 T(TEID flag)設定値の説明

bit	4	意味	備考
	0	TEIDが存在しない	使用
	1	TEIDが存在する	使用

6.1.4 MP (Message Priority)

MP (Message Priority)の有無を示します。Modify Bearer Requestのみ設定する場合があります。MP(Message Priority flag)設定値を表6.1.4-1に示します。

旧

	0	1	0	GTP version 2	使用

6.1.2 P(Piggybacking flag)

直収パケット交換機と直収回線等接続事業者ノードで使用されるGTPのプロトコルでのPiggybacking有無を示します。0(Piggybacking無)のみ使用いたします。P(Piggybacking flag)設定値を表6.1.2-1に示します。

表6.1.2-1 P(Piggybacking flag)設定値の説明

bit	5	情報長	備考
	0	Piggybacking無	使用
	1	Piggybacking有	未使用

6.1.3 T(TEID flag)

TEIDの存在有無を示します。直収パケット交換機と直収回線等接続事業者ノード間では、Echo Request、Echo ResponseとVersion Not Supported IndicationメッセージのGTPv2-Cメッセージヘッダには TEIDフィールドを設定いたしません。T(TEID flag)設定値を表6.1.3-1に示します。

表6.1.3-1 T(TEID flag)設定値の説明

bit	3	情報長	備考
	0	TEIDが存在しない	使用
	1	TEIDが存在する	使用

接続約款新旧対照表（本則・附則）（2025/12/31改正）

新

表6.1.4-1　MP(Message Priority flag)設定値の説明

bit	3	意味	備考
	0	Message Priorityが存在しない	使用
	1	Message Priorityが存在する	使用

6.1.5　Message Type

Message Typeフィールドは、GTPv2-Cパケットのタイプを識別します。直収パケット交換機はサポート外のMessage Typeを持つGTPv2-Cパケットを受信した場合、信号を破棄もしくは、エラー応答します。直収パケット交換機でサポートするGTPv2-Cパケットのメッセージ種別を表6.1.5-1に示します。

表6.1.5-1　GTPv2-Cパケットのメッセージ種別一覧

項番	メッセージ名	メッセージ種別値	備考
（略）			
14	Delete Bearer Command (MME/SGSN to PGW – S11/S4, S5/S8)	66	使用
15	Delete Bearer Failure Indication (PGW to MME/SGSN – S5/S8, S11/S4))	67	使用
（略）			
20	Create Bearer Request	95	使用

旧

6.1.4　Message Type

Message Typeフィールドは、GTPv2-Cパケットのタイプを識別します。直収パケット交換機はサポート外のMessage Typeを持つGTPv2-Cパケットを受信した場合、信号を破棄もしくは、エラー応答します。直収パケット交換機でサポートするGTPv2-Cパケットのメッセージ種別を表6.1.4-1に示します。

表6.1.4-1　GTPv2-Cパケットのメッセージ種別一覧

項番	メッセージ名	メッセージ種別値	備考
（略）			
14	Delete Bearer Command (MME/SGSN to PGW – S11/S4, S5/S8)	66	未使用
15	Delete Bearer Failure Indication (PGW to MME/SGSN – S5/S8, S11/S4))	67	未使用
（略）			
20	Create Bearer Request	95	未使用
21	Create Bearer Response	96	未使用

接続約款新旧対照表（本則・附則）（2025/12/31改正）

新

21	Create Bearer Response	96	使用
22	Update Bearer Request	97	使用
23	Update Bearer Response	98	使用
（略）			

6.1.6　Message Length（Payload情報長）
6.1.7　TEID

TEIDフィールドは、回線接続時もしくは直収パケット交換機変更時に、直収パケット交換機及び直収回線等接続事業者ノード内ユニークに払い出される回線を識別する番号となります。

直収パケット交換機で払い出したGTPv2-C用のTEID値は、Create Session RequestのPayload部のパラメータ[Sender F-TEID for Control Plane]（直収パケット交換機変更時は、Modify Bearer RequestのPayload部のパラメータ[Sender F-TEID for Control Plane]に設定されます)に設定して直収回線等接続事業者ノードに渡されます。

直収回線等接続事業者ノードで払い出されたGTPv2-C用のTEID値は、Create Session ResponseのPayload部のパラメータ[PGW S5/S8 F-TEID for PMIP based interface or for GTP based Control Plane interface]に設定して直収パケット交換機に渡されます。TEID（共通部分の設定）の構成及び設定値を図6.1.7-1、表6.1.7-1に示します。

8	1	
Tunnel Endpoint Identifier(1st octet)		1
Tunnel Endpoint Identifier(2nd octet)		2

旧

22	Update Bearer Request	97	未使用
23	Update Bearer Response	98	未使用
（略）			

6.1.5　Message Length（Payload情報長）
6.1.6　TEID

TEIDフィールドは、回線接続時もしくは直収パケット交換機変更時に、直収パケット交換機及び直収回線等接続事業者ノード内ユニークに払い出される回線を識別する番号となります。

直収パケット交換機で払い出したGTPv2-C用のTEID値は、Create Session RequestのPayload部のパラメータ[Sender F-TEID for Control Plane]（直収パケット交換機変更時は、Modify Bearer RequestのPayload部のパラメータ[Sender F-TEID for Control Plane]に設定されます)に設定して直収回線等接続事業者ノードに渡されます。

直収回線等接続事業者ノードで払い出されたGTPv2-C用のTEID値は、Create Session ResponseのPayload部のパラメータ[PGW S5/S8 F-TEID for PMIP based interface or for GTP based Control Plane interface]に設定して直収パケット交換機に渡されます。TEID（共通部分の設定）の構成及び設定値を図6.1.6-1、表6.1.6-1に示します。

8	1	
Tunnel Endpoint Identifier(1st octet)		1
Tunnel Endpoint Identifier(2nd octet)		2
Tunnel Endpoint Identifier(3rd octet)		3
Tunnel Endpoint Identifier(4th octet)		4

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Tunnel Endpoint Identifier(3rd octet)	3
Tunnel Endpoint Identifier(4th octet)	4

図6.1.7-1　TEID（共通部分の設定）の構成

表6.1.7-1　TEID（共通部分の設定）の設定値

信号名	設定値
Echo Request	フィールド自体設定されません
Echo Response	フィールド自体設定されません
Create Session Request	0が設定されます
Create Session Response	直収パケット交換機が払い出したTEIDを設定されます
Modify Bearer Request	直収回線等接続事業者ノードが払い出したTEIDを設定されます
Modify Bearer Response	直収パケット交換機が払い出したTEIDを設定されます
Delete Session Request	直収回線等接続事業者ノードが払い出したTEIDを設定されます
Delete Session Response	直収パケット交換機が払い出したTEIDを設定されます
Delete Bearer Command	直収パケット交換機が払い出したTEIDを設定されます
Delete Bearer Failure	直収回線等接続事業者ノードが払い出したTEID

旧

図6.1.6-1　TEID（共通部分の設定）の構成

表6.1.6-1　TEID（共通部分の設定）の設定値

信号名	設定値
Echo Request	フィールド自体設定されません
Echo Response	フィールド自体設定されません
Create Session Request	0が設定されます
Create Session Response	直収パケット交換機が払い出したTEIDを設定されます
Modify Bearer Request	直収回線等接続事業者ノードが払い出したTEIDを設定されます
Modify Bearer Response	直収パケット交換機が払い出したTEIDを設定されます
Delete Session Request	直収回線等接続事業者ノードが払い出したTEIDを設定されます
Delete Session Response	直収パケット交換機が払い出したTEIDを設定されます
Delete Bearer Request	直収パケット交換機が払い出したTEIDを設定されます
Delete Bearer Response	直収回線等接続事業者ノードが払い出したTEIDを設定されます

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Indication	を設定されます
Create Bearer Request	直収回線等接続事業者ノードが払い出したTEIDを設定されます
Create Bearer Response	直収パケット交換機が払い出したTEIDを設定されます
Update Bearer Request	直収回線等接続事業者ノードが払い出したTEIDを設定されます
Update Bearer Response	直収パケット交換機が払い出したTEIDを設定されます
Delete Bearer Request	直収パケット交換機が払い出したTEIDを設定されます
Delete Bearer Response	直収回線等接続事業者ノードが払い出したTEIDを設定されます

6.1.8 Sequence Number（シーケンスナンバ）

Sequence Numberフィールドは、GTPv2-CのRequest MessageとResponse Messageを対応付けさせるためのトランザクションIDとして使用されます。Request受信後にResponseを返送する時にRequestに設定されたSequence Number をコピーしてResponseのSequence Number に設定いたします。シーケンスナンバの構成を図6.1.81に示します。

8	1	
Sequence Number (1st Octet)		1
Sequence Number (2nd Octet)		2
Sequence Number (3rd Octet)		3

旧

6.1.7 Sequence Number（シーケンスナンバ）

Sequence Numberフィールドは、GTPv2-CのRequest MessageとResponse Messageを対応付けさせるためのトランザクションIDとして使用されます。Request受信後にResponseを返送する時にRequestに設定されたSequence Number をコピーしてResponseのSequence Number に設定いたします。シーケンスナンバの構成を図6.1.7-1に示します。

8	1	
Sequence Number (1st Octet)		1
Sequence Number (2nd Octet)		2
Sequence Number (3rd Octet)		3

図6.1.7-1 シーケンスナンバの構成

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図6.1.8-1　シーケンスナンバの構成

6.1.9　Message Priority

Message Priorityフィールドは、GTPv2-Cメッセージの優先度を示します。0～15までの任意の値を取ることができ、0が最も優先度が高く、15が最も優先度が低く扱われます。

6.2　GTPv2-CパケットのPayload

各GTPv2-CパケットのPayloadに設定されるパラメータは表6.2-1に従い記述されます。なお、パラメータの条件等は1.3　適用規定に従います。

表6.2-1　GTPv2-CパケットのPayloadに設定されるパラメータ一覧の説明

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
パラメータ名を記述します。	参照する項を示します。	Attributesの設定種別を示します。 ○記号一覧 M（Mandatory）：必須 C（Conditional）：条件付※ O（Optional）：オプション CO（Conditional-Optional）：条件付オプション	パラメータが固定長であるか可変長であるかを示します。 ○記号一覧 F (Fixed length)：固定長 V (Variable length):可変長	パラメータの情報長を示します。 単位は[Octet]です。 固定部分(1～4octets)は含まない。 ※可変長は-(ハイフン)とする。	パラメータの条件等を示します。

旧

6.2　GTPv2-CパケットのPayload

各GTPv2-CパケットのPayloadに設定されるパラメータは表6.2-1に従い記述されます。なお、パラメータの条件等は1.3　適用規定に従います。

表6.2-1　GTPv2-CパケットのPayloadに設定されるパラメータ一覧の説明

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
パラメータ名を記述します。	参照する項を示します。	Attributesの設定種別を示します。 ○記号一覧 M（Mandatory）：必須 C（Conditional）：条件付※ O（Optional）：オプション C0（Conditional-Optional）：条件付オプション※	パラメータが固定長であるか可変長であるかを示します。 ○記号一覧 F (Fixed length)：固定長 V (Variable length):可変長	パラメータの情報長を示します。 単位は[Octet]です。 固定部分(1～4octets)は含まない。	パラメータの条件等を示します。

6.2.2　Echo Response

Echo Responseは、直収パケット交換機と直収回線等接続事業者ノード間でヘルスチェックを行うため双方から送信されるEcho Request の応答の信

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		※			

6.2.2 Echo Response

Echo Responseは、直収パケット交換機と直収回線等接続事業者ノード間でヘルスチェックを行うため双方から送信されるEcho Request の応答の信号となります。Echo Responseのパラメータを表6.2.2-1及び表6.2.2-2に示します。

表6.2.2-2 Echo Responseのパラメータ

方向：直収パケット交換機←直収回線等接続事業者ノード

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
Recovery	7.3	M	F	1	
Cause	7.2	O	V	-	Don’t care
Sending Node Feature	-	CO	V	-	Don’t care
Private Extension	-	O	V	-	Don’t care

6.2.4 Create Session Request

Create Session Requestは、直収パケット交換機に対して移動無線装置から接続要求があった際、回線接続を行うために直収回線等接続事業者ノードへ送信されます。Create Session Requestのパラメータを表6.2.4-1に示します。

表6.2.4-1 Create Session Requestのパラメータ

旧

号となります。Echo Responseのパラメータを表6.2.2-1及び表6.2.2-2に示します。

表6.2.2-2 Echo Responseのパラメータ

方向：直収パケット交換機←直収回線等接続事業者ノード

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
Recovery	7.3	M	F	1	
Cause	7.2	O	V	2～6	Don’t care
Sending Node Feature	-	CO	V	-	Don’t care
Private Extension	-	O	V	-	Don’t care

6.2.4 Create Session Request

Create Session Requestは、直収パケット交換機に対して移動無線装置から接続要求があった際、回線接続を行うために直収回線等接続事業者ノードへ送信されます。Create Session Requestのパラメータを表6.2.4-1に示します。

表6.2.4-1 Create Session Requestのパラメータ

方向：直収パケット交換機→直収回線等接続事業者ノード

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
IMSI	7.1	M	F	8	

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方向：直収パケット交換機→直収回線等接続事業者ノード

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
IMSI	7.1	M	F	8	
MSISDN	7.8	C	V	-	
Mobile Equipment Identity (MEI)	7.7	C	F	8	
User Location Information (ULI)	7.15	C	V	-	
Serving Network	7.14	C	F	3	
RAT Type	7.13	M	F	1	
Indication Flags	7.9	C	V	-	
Sender F-TEID for Control Plane	7.16	M	V	-	
PGW S5/S8 Address for Control Plane or PMIP	-	C	V	-	未設定
Access Point Name (APN)	7.4	M	V	-	
Selection Mode	7.21	C	F	1	
PDN Type	7.19	C	F	1	
PDN Address Allocation (PAA)	7.11	C	V	-	

旧

MSISDN	7.8	C	V	6～8	
Mobile Equipment Identity (MEI)	7.7	C	F	8	
User Location Information (ULI)	7.15	C	V		
Serving Network	7.14	C	F	3	
RAT Type	7.13	M	F	1	
Indication Flags	7.9	C	V	4～6	
Sender F-TEID for Control Plane	7.16	M	V	-	
PGW S5/S8 Address for Control Plane or PMIP	-	C	V	-	未設定
Access Point Name (APN)	7.4	M	V	-	
Selection Mode	7.21	C	F	1	
PDN Type	7.19	C	F	1	
PDN Address Allocation (PAA)	7.11	C	V		
Maximum APN Restriction	7.20	C	F	1	0 (No Existing Contexts or Restriction)を設定します
Aggregate MAX Bit	7.5	C	F	8	

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Maximum APN Restriction	7.20	C	F	1	0 (No Existing Contexts or Restriction)を設定します
Aggregate MAX Bit Rate（APN-AMBR）	7.5	C	F	8	
Linked EPS Bearer ID	7.6	C	F	1	未設定
Protocol Configuration Options (PCO)	7.10	C	V	-	
Bearer Contexts to be created	7.17	M	V	-	表 6.2.4-2 Bearer Context to be created のパラメータ参照
Bearer Contexts to be removed	7.17	C	V	-	未設定
Trace Information	-	C	V	-	未設定
Recovery	7.3	C	F	1	
MME-FQ-CSID	-	C	V	-	未設定
SGW-FQ-CSID	-	C	V	-	未設定
ePDG-FQ-CSID	-	C	V	-	未設定
TWAN-FQ-CSID	-	C	V	-	未設定
UE Time Zone	7.22	CO	F	2	
User CSG Information	-	CO	V	-	未設定
Charging	-	C	F	2	未設定

旧

Rate（APN-AMBR）					
Linked EPS Bearer ID	7.6	C	F	-	未設定
Protocol Configuration Options (PCO)	7.10	C	V	-	
Bearer Contexts to be created	7.17	M	V	-	表 6.2.4-2 Bearer Context to be created のパラメータ参照
Bearer Contexts to be removed	7.17	C	V	-	未設定
Trace Information	-	C	F	-	未設定
Recovery	7.3	C	F	1	
MME-FQ-CSID	-	C	V	-	未設定
SGW-FQ-CSID	-	C	V	-	未設定
ePDG-FQ-CSID	-	C	V	-	未設定
TWAN-FQ-CSID	-	C	V	-	未設定
UE Time Zone	7.22	CO	F	2	
User CSG Information	-	CO	V	-	未設定
Charging Characteristics	-	C	F	-	未設定
（略）					

6.2.5 Create Session Response

Create Session Responseは、直収パケット交換機からCreate Session Requestを受信後、接続を許容・非許容に関わらず直収回線等接続事業者

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新

Characteristics					
（略）					

6.2.5 Create Session Response

Create Session Responseは、直収パケット交換機からCreate Session Requestを受信後、接続を許容・非許容に関わらず直収回線等接続事業者ノードから直収パケット交換機に送信されます。接続を許容させる場合は、causeパラメータに”Request Accepted”を設定します。非許容にする場合は、”Request Accepted”以外の非許容cause値を設定します。Create Session Responseのパラメータを表6.2.5-1に示します。

表6.2.5-1 Create Session Responseのパラメータ

方向：直収パケット交換機←直収回線等接続事業者ノード

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
Cause	7.2	M	V	-	
Change Reporting Action	-	C	V	-	Don’t Care
CSG Information Reporting Action	-	CO	V	-	Don’t Care
H(e)NB Information Reporting	-	CO	V	-	Don’t Care
Sender F-TEID for Control Plane	7.16	C	V	-	Don’t Care
PGW S5/S8 F-TEID for PMIP based	7.16	C	V	-	

旧

ノードから直収パケット交換機に送信されます。接続を許容させる場合は、causeパラメータに”Request Accepted”を設定します。非許容にする場合は、”Request Accepted”以外の非許容cause値を設定します。Create Session Responseのパラメータを表6.2.5-1に示します。

表6.2.5-1 Create Session Responseのパラメータ

方向：直収パケット交換機←直収回線等接続事業者ノード

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
Cause	7.2	M	V	2～6	
Change Reporting Action	-	C	F	-	Don’t Care
CSG Information Reporting Action	-	CO	V	-	Don’t Care
H(e)NB Information Reporting	-	CO	V	-	Don’t Care
Sender F-TEID for Control Plane	7.16	C	V	-	Don’t Care
PGW S5/S8 F-TEID for PMIP based interface or for GTP based Control Plane interface	7.16	C	V	-	
PDN Address Allocation (PAA)	7.11	C	V	-	

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interface or for GTP based Control Plane interface					
PDN Address Allocation (PAA)	7.11	C	V	-	
APN Restriction	7.20	C	F	1	
Aggregate Maximum Bit Rate (APN-AMBR)	7.5	C	F	8	
Linked EPS Bearer ID	7.6	C	F	1	Don’t Care
（略）					

表6.2.5-2　Bearer Context createdのパラメータ

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
EPS Bearer ID	7.6	M	F	5	
Cause	7.2	M	V	-	
（略）					

6.2.6　Modify Bearer Request

旧

APN Restriction	7.20	C	F	1	
Aggregate Maximum Bit Rate (APN-AMBR)	7.5	C	F	8	
Linked EPS Bearer ID	7.6	C	F	-	Don’t Care
（略）					

表6.2.5-2　Bearer Context createdのパラメータ

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
EPS Bearer ID	7.6	M	F	5	
Cause	7.2	M	V	2～6	
（略）					

6.2.6　Modify Bearer Request

Modify Bearer Requestは、通信中に移動無線装置の移動に伴いベアラ情報が変更された場合、直収パケット交換機から直収回線等接続事業者ノードに対し、Modify Bearer Requestを送信しベアラ情報が変更されたことを通知いたします。Modify Bearer Requestのパラメータを表6.2.6-1に示します。

表6.2.6-1　Modify Bearer Requestのパラメータ

方向：直収パケット交換機→直収回線等接続事業者ノード

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Modify Bearer Requestは、通信中に移動無線装置の移動に伴いベアラ情報が変更された場合、直収パケット交換機から直収回線等接続事業者ノードに対し、Modify Bearer Requestを送信しベアラ情報が変更されたことを通知いたします。Modify Bearer Requestのパラメータを表6.2.6-1に示します。

表6.2.6-1　Modify Bearer Requestのパラメータ
方向：直収パケット交換機→直収回線等接続事業者ノード

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
ME Identity (MEI)	7.7	C	V	-	条件により設定される場合があります
User Location Information (ULI)	7.15	C	V	-	未設定
Serving Network	7.14	C0	F	-	
RAT Type	7.13	C	F	1	
Indication Flags	7.9	C	V	-	
Sender F-TEID for Control Plane	7.16	C	V	-	
Aggregate Maximum Bit Rate (APN-AMBR)	7.5	C	F	8	未設定
Delay Downlink Packet Notification	-	C	F	1	未設定

旧

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
ME Identity (MEI)	7.7	C	V	-	条件により設定される場合があります
User Location Information (ULI)	7.15	C	V	-	未設定
Serving Network	7.14	C0	F	-	
RAT Type	7.13	C	F	1	
Indication Flags	7.9	C	F	-	未設定
Sender F-TEID for Control Plane	7.16	C	V	-	
Aggregate Maximum Bit Rate (APN-AMBR)	7.5	C	F	-	未設定
Delay Downlink Packet Notification Request	-	C	F	-	未設定
（略）					

6.2.7　Modify Bearer Response

Modify Bearer Responseは、直収パケット交換機からModify Bearer Requestを受信後、接続を許容・非許容に関わらず直収回線等接続事業者ノードから直収パケット交換機に送信されます。接続を許容させる場合は、causeパラメータに”Request Accepted”を設定します。非許容にする場合

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新

Request					
（略）					

6.2.7 Modify Bearer Response

Modify Bearer Responseは、直収パケット交換機からModify Bearer Requestを受信後、接続を許容・非許容に関わらず直収回線等接続事業者ノードから直収パケット交換機に送信されます。接続を許容させる場合は、causeパラメータに”Request Accepted”を設定します。非許容にする場合は、”Request Accepted”以外の非許容cause値を設定します。Modify Bearer Responseのパラメータを表6.2.7-1に示します。

表6.2.7-1 Modify Bearer Responseのパラメータ

方向：直収パケット交換機←直収回線等接続事業者ノード

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
Cause	7.2	M	V	-	
MSISDN	7.8	C	V	-	
Linked EPS Bearer ID	7.6	C	F	1	Don’t Care
Aggregate Maximum Bit Rate (APN-AMBR)	7.5	C	F	8	Don’t Care
APN Restriction	7.20	C	F	1	Don’t Care

旧

は、”Request Accepted”以外の非許容cause値を設定します。Modify Bearer Responseのパラメータを表6.2.7-1に示します。

表6.2.7-1 Modify Bearer Responseのパラメータ

方向：直収パケット交換機←直収回線等接続事業者ノード

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
Cause	7.2	M	V	2～6	
MSISDN	7.8	C	V	6～8	
Linked EPS Bearer ID	7.6	C	F	-	Don’t Care
Aggregate Maximum Bit Rate (APN-AMBR)	7.5	C	F	-	Don’t Care
APN Restriction	7.20	C	F	-	Don’t Care
（略）					

表6.2.7-2 Bearer Context modifiedのパラメータ

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
EPS Bearer ID	7.6	M	F	5	

接続約款新旧対照表（本則・附則）（2025/12/31改正）

新

（略）

表6.2.7-2　Bearer Context modifiedのパラメータ

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
EPS Bearer ID	7.6	M	F	5	
Cause	7.2	M	V	-	
（略）					

6.2.8　Delete Session Request

Delete Session Requestは、直収パケット交換機と直収回線等接続事業者ノード間回線切断を行うために送信されます。移動無線装置主導で回線切断を行う場合、直収パケット交換機から直収回線等接続事業者ノードへ送信されます。Delete Session Requestのパラメータを表6.2.8-1に示します。

表6.2.8-1　Delete Session Requestのパラメータ

方向：直収パケット交換機→直収回線等接続事業者ノード

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
Cause	7.2	C	V	-	条件により設定される場合があります

旧

Cause	7.2	M	V	2～6	
（略）					

6.2.8　Delete Session Request

Delete Session Requestは、直収パケット交換機と直収回線等接続事業者ノード間回線切断を行うために送信されます。移動無線装置主導で回線切断を行う場合、直収パケット交換機から直収回線等接続事業者ノードへ送信されます。Delete Session Requestのパラメータを表6.2.8-1に示します。

表6.2.8-1　Delete Session Requestのパラメータ

方向：直収パケット交換機→直収回線等接続事業者ノード

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
Cause	7.2	C	V	-	条件により設定される場合があります
Linked EPS Bearer ID (LBI)	7.6	C	F	1	
User Location Information (ULI)	7.15	C	V	-	未設定
Indication Flags	7.9	C	F	-	未設定
Protocol Configuration Options (PCO)	7.10	C	V	-	未設定

接続約款新旧対照表（本則・附則）（2025/12/31改正）

新

Linked EPS Bearer ID (LBI)	7.6	C	F	1	
User Location Information (ULI)	7.15	C	V	-	未設定
Indication Flags	7.9	C	F	-	未設定
Protocol Configuration Options (PCO)	7.10	C	V	-	未設定
Originating Node	-	C	F	1	未設定
（略）					

6.2.9 Delete Session Response

Delete Session Responseは、直収パケット交換機から送信されたDelete Session Requestに対する応答信号になります。Delete Session Responseのパラメータを表6.2.9-1に示します。

表6.2.9-1 Delete Session Responseのパラメータ

方向：直収パケット交換機←直収回線等接続事業者ノード

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
Cause	7.2	M	V	-	
（略）					

旧

Originating Node	-	C	F	-	未設定
（略）					

6.2.9 Delete Session Response

Delete Session Responseは、直収パケット交換機から送信されたDelete Session Requestに対する応答信号になります。Delete Session Responseのパラメータを表6.2.9-1に示します。

表6.2.9-1 Delete Session Responseのパラメータ

方向：直収パケット交換機←直収回線等接続事業者ノード

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
Cause	7.2	M	V	2～6	
（略）					

接続約款新旧対照表（本則・附則）（2025/12/31改正）

新	旧

6.2.10　Create Bearer Request

　Create Bearer Requestは、接続中のセッションに対してベアラを追加する又は位置情報取得を要求する場合、直収回線等接続事業者ノードから直収パケット交換機に送信します。Create Bearer Requestのパラメータを表6.2.10-1に示します。

表6.2.10-1　Create Bearer Requestのパラメータ

方向：直収パケット交換機←直収回線等接続事業者ノード

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
Procedure Transaction Id (PTI)	7.24	C	F	1	
Linked Bearer Identity (LBI)	7.6	M	F	1	
Protocol Configuration Options (PCO)	7.10	O	V	-	
Bearer Contexts	7.17	M	V	-	表　6.2.10-2　Bearer Contextのパラメータ参照

表6.2.10-2　Bearer Contextのパラメータ

新

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
EPS Bearer ID	7.6	M	F	5	
TFT	7.23	M	V	-	
S5/8-U PGW F-TEID	7.16	C	V	-	
Bearer Level QoS	7.12	M	F	26	
Charging Id	7.18	C	F	8	

6.2.11 Create Bearer Response

Create Bearer Responseは、直収回線等接続事業者ノードから送信されたCreate Bearer Requestに対する応答信号になります。Create Bearer Responseのパラメータを表6.2.11-1に示します。

表6.2.11-1 Create Bearer Responseのパラメータ

方向：直収パケット交換機→直収回線等接続事業者ノード

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
Cause	7.2	M	V	-	
Bearer Contexts	7.17	M	V	-	表 6.2.11-2 Bearer Contextのパラメータ参照

旧

新	旧

Recovery	7.3	C	F	1	
Protocol Configuration Options (PCO)	7.10	C	V	-	
User Location Information (ULI)	7.15	CO	V	-	条件により設定される場合があります

表6.2.11-2 Bearer Contextのパラメータ

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
EPS Bearer ID	7.6	M	F	5	
Cause	7.2	M	V	-	
S5/8-U SGW F-TEID	7.16	C	V	-	
S5/8-U PGW F-TEID	7.16	C	V	-	

6.2.12 Update Bearer Request

Update Bearer Requestは、位置情報取得(NetLoc)を要求するため直収回線等接続事業者ノードから直収パケット交換機に送信する。Update Bearer Requestのパラメータを表6.2.12-1に示します。

表6.2.12-1 Update Bearer Requestのパラメータ

方向：直収パケット交換機←直収回線等接続事業者ノード

接続約款新旧対照表（本則・附則）（2025/12/31改正）

新	旧

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
Bearer Contexts	7.17	M	V	-	表　6.2.12-2　Bearer Contextのパラメータ参照
Procedure Transaction Id (PTI)	7.24	C	F	1	
Protocol Configuration Options (PCO)	7.10	C	V	-	
Aggregate Maximum Bit Rate (APN-AMBR)	7.5	M	F	8	
Indication flags	7.9	CO	V	-	

表6.2.12-2　Bearer Contextのパラメータ

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
EPS Bearer ID	7.6	M	F	5	
TFT	7.23	C	V	-	
Bearer Level QoS	7.12	C	F	26	

接続約款新旧対照表（本則・附則）（2025/12/31改正）

<table>
<tr><th>新</th><th>旧</th></tr>
<tr><td>

6.2.13 Update Bearer Response

Update Bearer Responseは、直収回線等接続事業者ノードから送信されたUpdate Bearer Requestに対する応答信号になります。Update Bearer Responseのパラメータを表6.2.13-1に示します。

表6.2.13-1 Update Bearer Responseのパラメータ

方向：直収パケット交換機→直収回線等接続事業者ノード

<table>
<tr><th rowspan="2">パラメータ</th><th rowspan="2">参照</th><th rowspan="2">種別</th><th colspan="2">情報長</th><th rowspan="2">備考</th></tr>
<tr><th>F.V</th><th>Oct</th></tr>
<tr><td>Cause</td><td>7.2</td><td>M</td><td>V</td><td>-</td><td></td></tr>
<tr><td>Bearer Contexts</td><td>7.17</td><td>M</td><td>V</td><td>-</td><td>表 6.2.13-2 Bearer Contextのパラメータ参照</td></tr>
<tr><td>Protocol Configuration Options (PCO)</td><td>7.10</td><td>CO</td><td>V</td><td>-</td><td></td></tr>
<tr><td>Recovery</td><td>7.3</td><td>C</td><td>F</td><td>1</td><td></td></tr>
<tr><td>User Location Information (ULI)</td><td>7.15</td><td>CO</td><td>V</td><td>-</td><td>条件により設定される場合があります</td></tr>
</table>

表6.2.13-2 Bearer Contextのパラメータ

</td><td>

6.2.10 Delete Bearer Request

Delete Bearer Requestは、直収パケット交換機と直収回線等接続事業者ノード間回線切断を行うために送信されます。直収回線等接続事業者ノード主導で回線切断を行う場合、直収回線等接続事業者ノードから直収パケット

</td></tr>
</table>

接続約款新旧対照表（本則・附則）（2025/12/31改正）

新

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
EPS Bearer ID	7.6	M	F	5	
Cause	7.2	M	V	-	

6.2.14 Delete Bearer Request

Delete Bearer Requestは、直収パケット交換機と直収回線等接続事業者ノード間回線切断を行うために送信されます。直収回線等接続事業者ノード主導で回線切断を行う場合、直収回線等接続事業者ノードから直収パケット交換機へ送信されます。Delete Bearer Requestのパラメータを表6.2.14-1に示します。

表6.2.14-1 Delete Bearer Requestのパラメータ

方向：直収パケット交換機←直収回線等接続事業者ノード

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
Linked EPS Bearer ID (LBI)	7.6	C	F	1	
EPS Bearer IDs	7.6	C	F	1	Don’t Care
Failed Bearer Contexts	7.17	O	V	-	Don’t Care
Procedure Transaction Id (PTI)	7.24	C	F	1	Don’t Care

旧

交換機へ送信されます。Delete Bearer Requestのパラメータを表6.2.10-1に示します。

表6.2.10-1 Delete Bearer Requestのパラメータ

方向：直収パケット交換機←直収回線等接続事業者ノード

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
Linked EPS Bearer ID (LBI)	7.6	C	F	1	
EPS Bearer IDs	7.6	C	F	-	Don’t Care
Failed Bearer Contexts	7.17	O	V	-	Don’t Care
Procedure Transaction Id (PTI)	-	C	F	-	Don’t Care
（略）					

6.2.11 Delete Bearer Response

Delete Bearer Responseは、直収回線等接続事業者ノードから送信されたDelete Bearer Requestに対する応答信号になります。Delete Bearer Responseのパラメータを表6.2.11-1に示します。

表6.2.11-1 Delete Bearer Responseのパラメータ

方向：直収パケット交換機→直収回線等接続事業者ノード

接続約款新旧対照表（本則・附則）（2025/12/31改正）

新

（略）

6.2.15　Delete Bearer Response

Delete Bearer Responseは、直収回線等接続事業者ノードから送信されたDelete Bearer Requestに対する応答信号になります。Delete Bearer Responseのパラメータを表6.2.15-1に示します。

表6.2.15-1　Delete Bearer Responseのパラメータ

方向：直収パケット交換機→直収回線等接続事業者ノード

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
Cause	7.2	M	V	-	
Linked EPS Bearer ID (LBI)	7.6	C	F	1	
Bearer Contexts	7.17	C	V	-	
（略）					

表6.2.15-2　Bearer Contextのパラメータ

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
EPS Bearer ID	7.6	M	F	1	
Cause	7.2	M	V	-	

旧

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
Cause	7.2	M	V	2～6	
Linked EPS Bearer ID (LBI)	7.6	C	F	1	
Bearer Contexts	7.17	C	V	-	未設定
（略）					

新

6.2.16 Delete Bearer Command

Delete Bearer Commandは、直収パケット交換機と直収回線等接続事業者ノード間回線切断を要求するために送信します。直収パケット交換機主導で回線切断を要求する場合に直収パケット交換機から直収回線等接続事業者ノードに送信します。Delete Bearer Commandのパラメータを表6.2.16-1に示します。

表6.2.16-1 Delete Bearer Commandのパラメータ

方向：直収パケット交換機→直収回線等接続事業者ノード

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
Bearer Context	7.17	M	V	-	表 6.2.16-2 Bearer Contextのパラメータ参照
Sender F-TEID for Control Plane	7.16	CO	V	-	

表6.2.16-2 Bearer Contextのパラメータ

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
EPS Bearer ID	7.6	M	F	5	

6.2.17 Delete Bearer Failure Indication

Delete Bearer Failure Indicationは、直収回線等接続事業者ノードか

旧

新

らDelete Bearerするために送信します。直収パケット交換機主導で回線切断を要求する場合に直収パケット交換機から直収回線等接続事業者ノードに送信します。Delete Bearer Commandのパラメータを表6.2.17-1に示します。

表6.2.17-1 Delete Bearer Failure Indicationのパラメータ
方向：直収パケット交換機→直収回線等接続事業者ノード

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
Cause	7.2	M	V	-	
Bearer Context	7.17	M	V	-	
Recovery	7.3	C	F	1	

表6.2.17-2 Bearer Contextのパラメータ

パラメータ	参照	種別	情報長		備考
			F.V	Oct	
EPS Bearer ID	7.6	M	F	5	
Cause	7.2	M	V	-	

旧

7．GTPv2-Cパケット構成要素

直収パケット交換機と直収回線等接続事業者ノード間で使用するGTPv2-Cパラメータの一覧を表7-1に示します

表7-1 GTPv2-Cパラメータ一覧

値	パラメータ	備考
（略）		
84	EPS Bearer Level Traffic Flow Template (Bearer TFT)	未使用

接続約款新旧対照表（本則・附則）（2025/12/31改正）

新

7．GTPv2-Cパケット構成要素

直収パケット交換機と直収回線等接続事業者ノード間で使用するGTPv2-Cパラメータの一覧を表7-1に示します

表7-1　GTPv2-Cパラメーター一覧

値	パラメータ	備考
（略）		
84	EPS Bearer Level Traffic Flow Template (Bearer TFT)	使用
（略）		
100	Procedure Transaction ID	使用
（略）		

7.23　EPS Bearer Level Traffic Flow Template (Bearer TFT)

EPS Bearer Level Traffic Flow Template は5オクテット以上で構成され、EPS Bearer Level Traffic Flow Template (TFT)が設定されます。EPS Bearer Level Traffic Flow Template (Bearer TFT)のフォーマットおよび情報要素を図7.23-1に示します。

Bits							
Octets	8	7	6	5	4	3	2	1
1	Type = 84(decimal)							
2 to 3	Length = n							
4	Spare				Instance			

旧

（略）		
100	Procedure Transaction ID	未使用
（略）		

接続約款新旧対照表（本則・附則）（2025/12/31改正）

新

5 to (n+4)	EPS Bearer Level Traffic Flow Template (TFT)	

図7.23-1　EPS Bearer Level Traffic Flow Template (Bearer TFT)

7.24　Procedure Transaction ID

Procedure Transaction ID は５オクテットで構成され、Procedure Transaction IDが設定されます。Procedure Transaction IDのフォーマットおよび情報要素を図7.24-1に示します。

Octets	Bits 8	7	6	5	4	3	2	1
1	Type = 100 (decimal)							
2 to 3	Length = n							
4	Spare				Instance			
5	Procedure Transaction ID							
6 to (n+4)	These octet(s) is/are present only if explicitly specified							

図7.24-1　Procedure Transaction IDフォーマット

表10－１－３　シーケンス

シーケンス番号一覧

(アクセス制御プロトコルGTPv2-C/ユーザデータ転送プロトコルGTPv1-U)

分類	分類番号		種別	ページ
(略)				
再開	O	1	直収パケット交換機再開	技別10-1-

旧

別表10－１－３　シーケンス

シーケンス番号一覧

(アクセス制御プロトコルGTPv2-C/ユーザデータ転送プロトコルGTPv1-U)

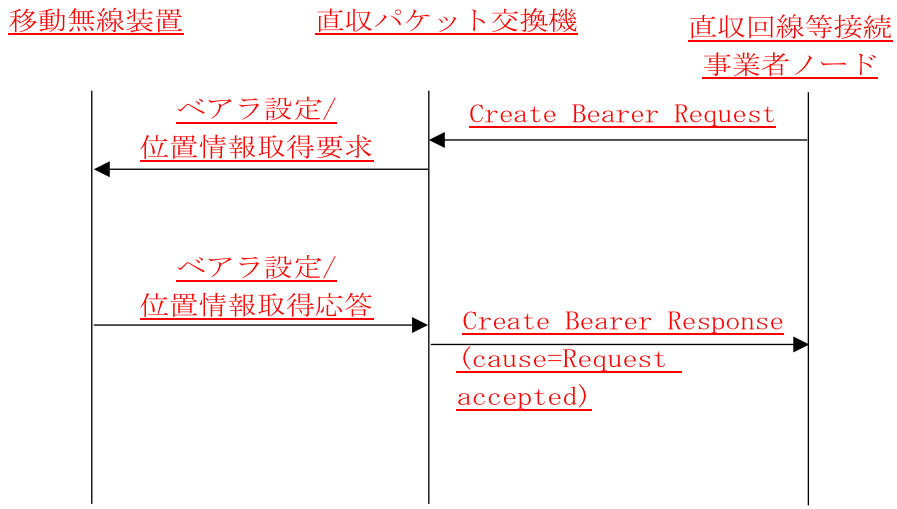
分類	分類番号		種別	ページ
(略)				
再開	O	1	直収パケット交換機再開	技別10-1-3-16
		2	直収回線等接続事業者ノード再開	技別10-1-3-17

接続約款新旧対照表（本則・附則）（2025/12/31改正）

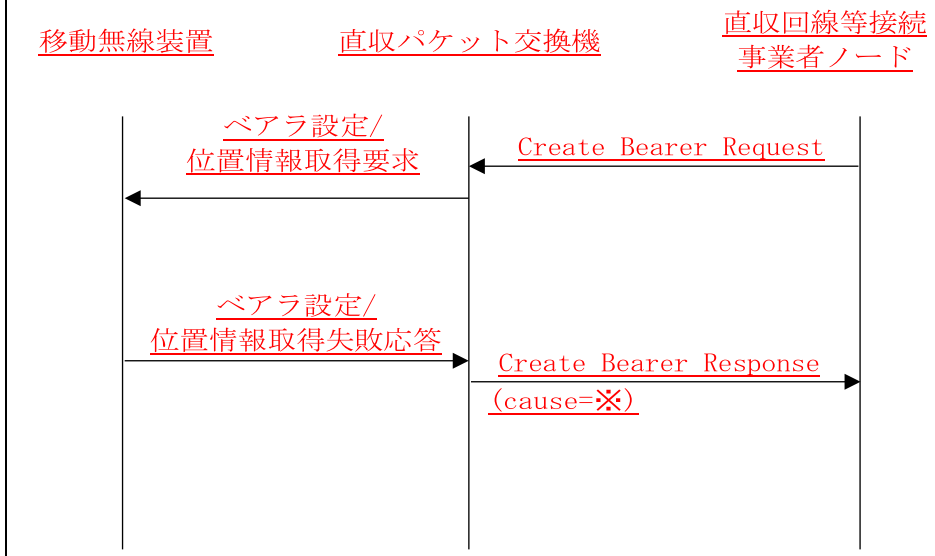
新					旧
				3-16	（中略）
		2	直収回線等接続事業者ノード再開	技別10-1-3-17	
ベアラ設定処理/位置情報取得	P	1	Dedicated Bearer設定/位置情報取得成功	技別10-1-3-19	
		2	Dedicated Bearer設定/位置情報取得失敗	技別10-1-3-19	
ベアラ更新/位置情報取得	Q	1	ベアラ(Dedicated)更新/位置情報取得成功	技別10-1-3-20	
		2	ベアラ(Dedicated)更新/位置情報取得失敗	技別10-1-3-20	
ベアラ切断処理(直収パケット交換機起動)	R	1	Delete Bearer Command成功	技別10-1-3-21	
		2	Delete Bearer Command失敗	技別10-1-3-22	
		3	Delete Bearer Commandリトライアウト	技別10-1-3-22	
（中略）					

接続約款新旧対照表（本則・附則）（2025/12/31改正）

新			旧
ベアラ設定処理/位置情報取得処理（直収回線等接続事業者網起動）	P 1	Dedicated Bearer設定成功/位置情報取得成功	

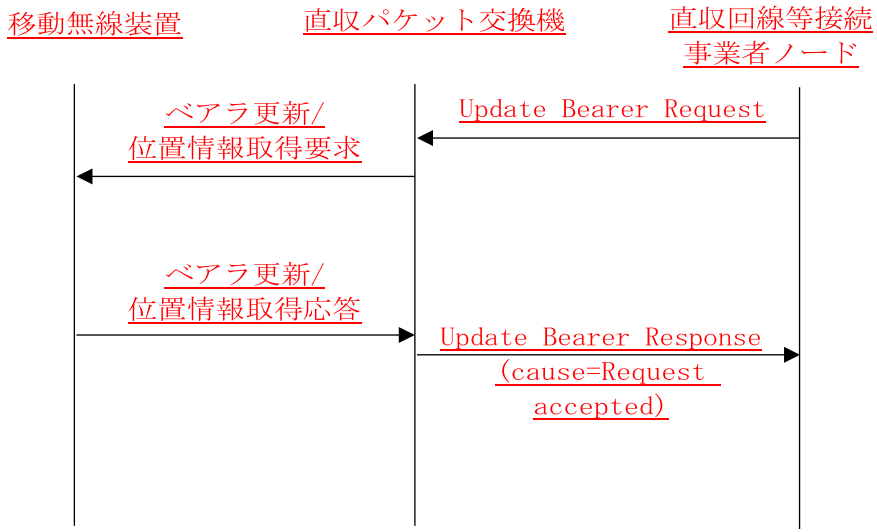


接続約款新旧対照表（本則・附則）（2025/12/31改正）

新	旧
ベアラ設定処理/位置情報取得処理（直収回線等接続事業者網起動）　P 2　Dedicated Bearer設定失敗/位置情報取得失敗  ※Request accepted以外	

接続約款新旧対照表（本則・附則）（2025/12/31改正）

新			旧
ベアラ更新/位置情報取得処理（直収回線等接続事業者網起動）	Ｑ１	Dedicated Bearer設定失敗/位置情報取得失敗	

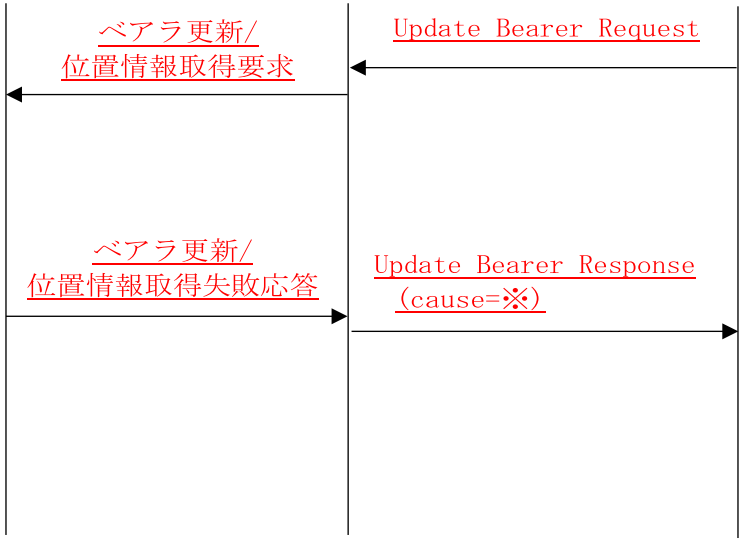


接続約款新旧対照表（本則・附則）（2025/12/31改正）

新	旧

ベアラ更新/位置情報取得処理（直収回線等接続事業者網起動）	Ｑ２	ベアラ(Dedicated)更新/位置情報取得失敗

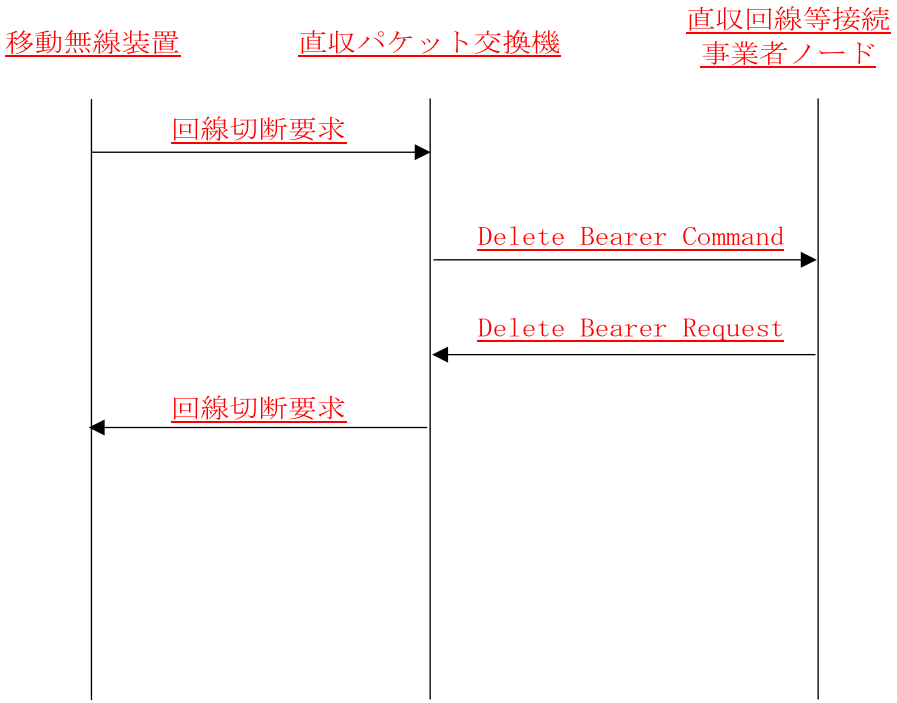
移動無線装置　　直収パケット交換機　　直収回線等接続事業者ノード



※Request accepted以外

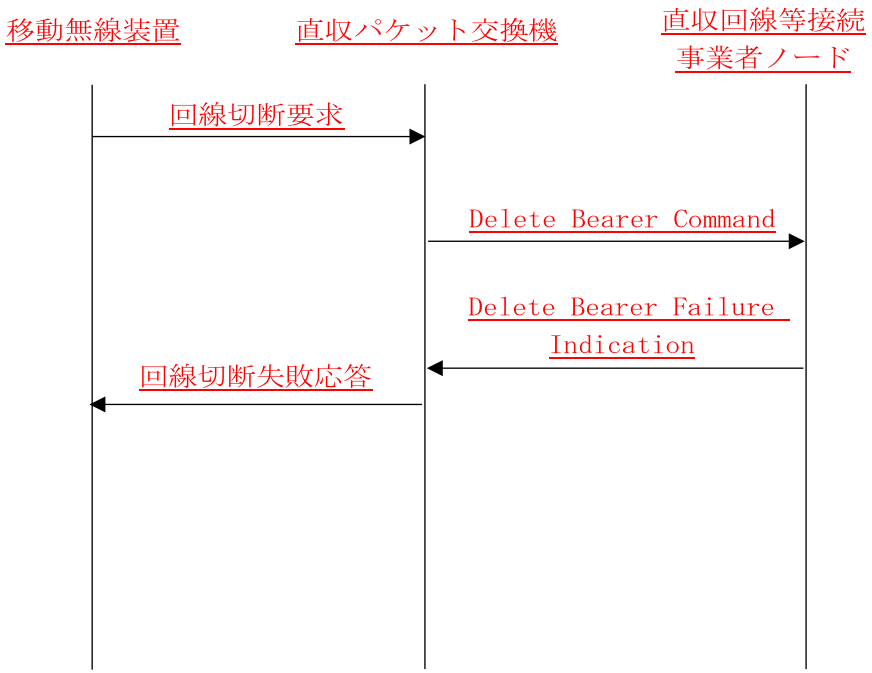
接続約款新旧対照表（本則・附則）（2025/12/31改正）

新			旧
ベアラ切断処理（移動無線装置起動）	R１	ベアラ切断成功(Delete Bearer Request以降はK1と同様)	

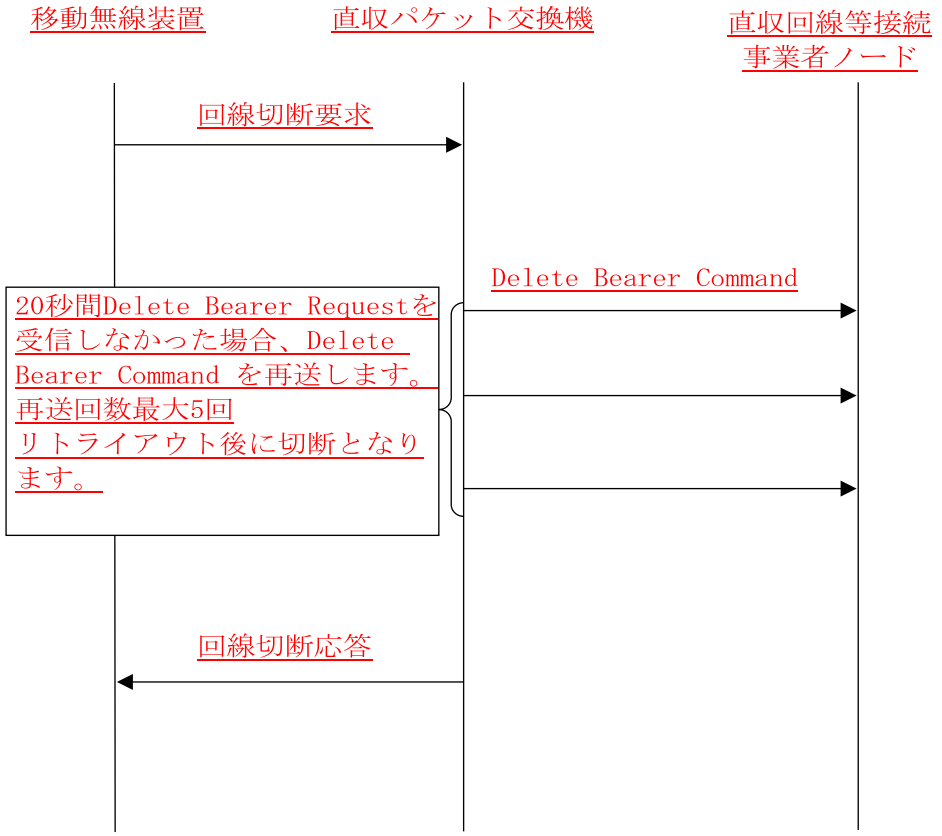


接続約款新旧対照表（本則・附則）（2025/12/31改正）

新			旧
ベアラ切断処理（移動無線装置起動）	R２	ベアラ切断失敗(Delete Bearer Command失敗)	



接続約款新旧対照表（本則・附則）（2025/12/31改正）

新	旧
ベアラ切断処理（移動無線装置起動）	R３	Delete Bearer Commandリトライアウト  	

接続約款新旧対照表（本則・附則）（2025/12/31改正）

新	旧
別表14　直接協定事業者HSS接続用インタフェース仕様 別表15　直接協定事業者SMSC接続用インタフェース仕様	

技術的条件集別表14
直接協定事業者
HSS接続用
インタフェース仕様

技術的条件集別表14－１
制御プロトコル仕様

本別表の規定内容は、3GPP TS 29.272 V11.5.0 (2012-12)を参照している。
本別表では、3GPP 標準の規定に対して当社の準拠状況及び留意点を記述するとともに、当社による追記箇所を青字で記載している。

各項における[DOCOMO Compliance]において 3GPP 標準の規定に対する当社の準拠状況を示す。
- Not Applicable : 該当なし
- Full Compliance : 準拠
- Partial Compliance : 一部準拠
- Not Compliance : 非準拠

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

この技術仕様書は、3GPP によって作成された。

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

本文書の内容は TSG 内での継続的な作業の対象であり、TSG による正式承認後に変更される可能性がある。TSG が本文書の内容を変更した場合、TSG により再発行され、発行日を変更して識別し、バージョン番号を以下のように追加する：

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

バージョン x.y.z

以下を意味する：

x 最初の桁：

1 TSG に情報提供するために提出されたもの。

2 TSG に承認されるために提出されたもの。

3 3 以上は TSG による変更管理下で承認された文書。

y 2 番目の桁は、技術的改良、修正、更新など、内容に変更があるすべての改訂で追加される。

z 3 番目の桁は、文書に編集上の変更のみが組み込まれた場合に追加される。

[DOCOMO Compliance]

Compliance : Not Applicable

［ドコモ仕様の準拠状況］

準拠状況 : 該当なし

1 Scope

The present document describes the Mobility Management Entity (MME) and Serving GPRS Support Node (SGSN) related diameter-based interfaces towards the Home Subscriber Server (HSS) or the CSG Subscriber Server (CSS), and the MME and the SGSN related diameter-based interface towards the Equipment Identity Register (EIR).

本文書は、利用者管理認証装置（HSS）又は CSG 加入者サーバー（CSS）に対する移動管理装置（MME）及びサービス GPRS サポートノード（SGSN）関連の diameter ベースインターフェース、並びに機器識別登録（EIR）に対する MME 及び SGSN 関連の diameter ベースインターフェースについて記述する。

This specification defines the Diameter application for the MME-HSS, S6a reference point, for the MME-CSS, S7a reference point, for the SGSN-HSS, S6d reference point, and for the SGSN-CSS, S7d reference point. The interactions between the HSS/CSS and the MME/SGSN are specified, including the signalling flows.

本仕様は、MME-HSS 間の S6a 参照点、MME-CSS 間の S7a 参照点、SGSN-HSS 間の S6d 参照点及び SGSN-CSS 間の S7d 参照点における Diameter アプリケーションを定義する。HSS/CSS と MME/SGSN 間の相互作用（シグナリングフローを含む）を規定する。

This specification defines the Diameter application for the MME-EIR, S13 reference point, and for the SGSN-EIR, S13' reference point. The interactions between the MME/SGSN and the EIR are specified, including the signalling flows.

本仕様は、MME-EIR 間及び SGSN-EIR 間の S13 参照ポイントにおける Diameter アプリケーションを定義する。MME/SGSN と EIR 間の相互作用（シグナリングフローを含む）を規定する。

In this specification, if there is no specific indication, the following principles apply:

- "SGSN" refers to an SGSN which at least supports the S4 interface and may support Gn and Gp interfaces.
- "S4-SGSN" refers to an SGSN which supports the S4 interface and does not support Gn and Gp interfaces.
- Gn/Gp-SGSN refers to an SGSN which supports the Gn and Gp interfaces and does not support S4 interface.
- "GPRS subscription data" refers to the parameters in the HLR column in Table 5.2. in 3GPP TS 23.008 [30].
- "EPS subscription data" refers to the parameters in the HSS column in Table 5.2A-1 in 3GPP TS 23.008 [30].

The Evolved Packet System stage 2 description (architecture and functional solutions) is specified in 3GPP TS 23.401 [2] and in 3GPP TS 23.060 [12].

本仕様書において、特に指定がない場合、以下の原則が適用される：

- 「SGSN」とは、少なくとも S4 インターフェースをサポートし、Gn 及び Gp インターフェースをサポートする場合もある SGSN を指す。
- 「S4-SGSN」とは、S4 インターフェースをサポートし、Gn 及び Gp インターフェースをサポートしない SGSN を指す。
- 「Gn/Gp-SGSN」とは、Gn 及び Gp インターフェースをサポートし、S4 インターフェースをサポートしない SGSN を指す。
- 「GPRS 加入者データ」とは、3GPP TS 23.008［30］の表 5.2 の HLR 欄に記載されているパラメータを指す。

- 「EPS 加入者データ」とは、3GPP TS 23.008［30］の表 5.2A-1 の HSS 欄に記載されているパラメータを指す。

The Evolved Packet System ステージ 2 の仕様（アーキテクチャ及び機能ソリューション）は、3GPP TS 23.401［2]及び 3GPP TS 23.060［12］に規定されている。

[DOCOMO Compliance]

Compliance : Not Applicable

［ドコモ仕様の準拠状況］

準拠状況 : 該当なし

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.401: "GPRS enhancements for E-UTRAN access ".

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

[4] IETF RFC 3588: "Diameter Base Protocol".

[5] 3GPP TS 33.401: "3GPP System Architecture Evolution: Security Architecture".

[6] IETF RFC 4005: "Diameter Network Access Server Application".

[7] IETF RFC 2234: "Augmented BNF for syntax specifications".

[8] 3GPP TS 32.299: "Charging management; Diameter charging applications".

[9] 3GPP TS 29.229: "Cx and Dx interfaces based on the Diameter protocol".

[10] 3GPP TS 29.212: "Policy and Charging Control (PCC); Reference points".

[11] 3GPP TS 29.214: "Policy and Charging Control over Rx reference point".

[12] 3GPP TS 23.060: "General Packet Radio Service (GPRS); Service description; Stage 2".

[13] 3GPP TS 22.016: "International Mobile station Equipment Identities (IMEI)".

[14] IETF RFC 4960: "Stream Control Transmission Protocol".

[15] Void

[16] 3GPP TS 33.210: "3G Security; Network Domain Security; IP Network Layer Security"..

[17] 3GPP TS 29.228: "IP multimedia (IM) Subsystem Cx and Dx Interfaces; Signalling flows and Message Elements".

[18] 3GPP TS 33.102: "3G Security; Security Architecture".

[19] 3GPP TS 36.413: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 Application Protocol (S1AP)".

[20] IETF RFC 5778: "Diameter Mobile IPv6: Support for Home Agent to Diameter Server Interaction".

[21] 3GPP TS 29.061: "Interworking between the Public Land Mobile Network (PLMN) supporting packet based services and Packet Data Networks (PDN)".

[22] 3GPP TS 32.298: "Charging Management; CDR parameter description".

[23] 3GPP TS 32.422: "Telecommunication management; Subscriber and equipment trace; Trace control and configuration management".

[24] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[25] 3GPP TS 29.329: "Sh Interface based on the Diameter protocol".

[26] IETF RFC 5447: "Diameter Mobile IPv6: Support for Network Access Server to Diameter Server Interaction".

[27] IETF RFC 4004: "Diameter Mobile IPv4 Application".

[28] 3GPP2 A.S0022: "Interoperability Specification (IOS) for Evolved High Rate Packet Data (eHRPD) Radio Access Network Interfaces and Interworking with Enhanced Universal Terrestrial Radio Access Network (E-UTRAN)".

[29] 3GPP TS 23.011: "Technical realization of Supplementary Services - General Aspects".

[30] 3GPP TS 23.008: "Organization of subscriber data".

[31] 3GPP TS 24.008: "Mobile radio interface Layer 3 specification; Core network protocols; Stage 3".

[32] IETF RFC 5516: "Diameter Command Code Registration for Third Generation Partnership Project (3GPP) Evolved Packet System (EPS)".

[33] 3GPP TS 32.251: "Telecommunication management; Charging management; Packet Switched (PS) domain charging".

[34] 3GPP TS 23.292: " IP Multimedia Subsystem (IMS) centralized services ".

[35] 3GPP TS 23.216: "Single Radio Voice Call Continuity (SRVCC)".

[36] 3GPP TS 23.015:"Technical realization of Operator Determined Barring (ODB)".

[37] 3GPP TS 29.173: "Diameter-based SLh interface for Control Plane LCS".

[38] 3GPP TS 29.303: "Domain Name System Procedures; Stage 3".

[39] 3GPP TS 29.060: "General Packet Radio Service (GPRS); GPRS Tunnelling Protocol (GTP) across the Gn and Gp Interface".

[40] 3GPP TS 36.300: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2".

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

[42] 3GPP TS 22.042: "Network Identity and TimeZone (NITZ); Service description; Stage 1".

[43] 3GPP TS 23.007: "Restoration procedures".

[44] 3GPP TS 23.272: "Circuit Switched (CS) fallback in Evolved Packet System (EPS); Stage 2".

[45] 3GPP TS 29.010: "Information element mapping between Mobile Station - Base Station System (MS - BSS) and Base Station System - Mobile-services Switching Centre (BSS - MSC)".

[DOCOMO Compliance]

Compliance : Not Applicable

3 Definitions and abbreviations

[DOCOMO Compliance]

Compliance : Not Applicable

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].**CSG subscription data from CSS:** It identifies the CSG subscription data that a MME or a SGSN has received from a CSS for a subscriber identified by its IMSI.

CSG subscription data from HSS: It identifies the CSG subscription data that a MME or a SGSN has received from a HSS for a subscriber identified by its IMSI.

[DOCOMO Compliance]

Compliance : Not Applicable

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

AVP	Attribute Value Pair
C	Conditional
CSS	CSG Subscriber Server
EIR	Equipment Identity Register
ESM	EPS Session Management
HSS	Home Subscriber Server
IE	Information Element
M	Mandatory
MME	Mobility Management Entity
NR	New Radio
O	Optional
ODB	Operator Determined Barring
URRP-MME	User Reachability Request Parameter for MME
URPP-SGSN	User Reachability Request Parameter for SGSN

[DOCOMO Compliance]

Compliance : Not Applicable

4 General Description

This document describes the S6a/S6d and S13/S13' interfaces related procedures, message parameters and protocol specifications.

The procedures, message parameters and protocol are similar between S6a and S6d. S6a is used for location changes of the MME, while S6d is for location changes of the SGSN. Refer to section 5 for the differences, especially section 5.2.1.

The procedures, message parameters and protocol are identical as for the S13 and S13'. See section 6 for details.

In the tables that describe the Information Elements transported by each Diameter command, each Information Element is marked as (M) Mandatory, (C) Conditional or (O) Optional in the "Cat." column. For the correct handling of the Information Element according to the category type, see the description detailed in section 6 of the 3GPP TS 29.228 [17].

[DOCOMO Compliance]

Compliance : Not Applicable

5 MME – HSS (S6a) and SGSN – HSS (S6d)

[DOCOMO Compliance]

Compliance : Not Applicable

Comment :

- No description is applicable for SGSN, which is the precondition throughout this document.

5.1 Introduction

The S6a interface enables the transfer of subscriber related data between the MME and the HSS as described in the 3GPP TS 23.401 [2].

The S6d interface enables the transfer of subscriber related data between the SGSN and the HSS as described in 3GPP TS 23.060 [12].

[DOCOMO Compliance]

Compliance : Not Applicable

5.2 Mobility Services

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.1 Location Management Procedures

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.1.1 Update Location

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.1.1.1 General

The Update Location Procedure shall be used between the MME and the HSS and between the SGSN and the HSS to update location information in the HSS. The procedure shall be invoked by the MME or SGSN and is used:

- to inform the HSS about the identity of the MME or SGSN currently serving the user, and optionally in addition;
- to update MME or SGSN with user subscription data;
- to provide the HSS with other user data, such as Terminal Information or UE SRVCC Capability.

This procedure is mapped to the commands Update-Location-Request/Answer (ULR/ULA) in the Diameter application specified in chapter 7.

Table 5.2.1.1.1/1 specifies the involved information elements for the request.

Table 5.2.1.1.1/2 specifies the involved information elements for the answer.

Table 5.2.1.1.1/1: Update Location Request

Information element name	Mapping to Diameter AVP	Cat.	Description
IMSI	User-Name (See IETF RFC 3588 [4])	M	This information element shall contain the user IMSI, formatted according to 3GPP TS 23.003 [3], clause 2.2.
Supported Features (See 3GPP TS 29.229 [9])	Supported-Features	O	If present, this information element shall contain the list of features supported by the origin host.
Terminal Information (See 7.3.3)	Terminal-Information	O	This information element shall contain information about the user's mobile equipment. Within this Information Element, only the IMEI and the Software-Version AVPs shall be used on the S6a/S6d interface.
ULR Flags (See 7.3.7)	ULR-Flags	M	This Information Element contains a bit mask. See 7.3.7 for the meaning of the bits.
Visited PLMN Id (See 7.3.9)	Visited-PLMN-Id	M	This IE shall contain the MCC and the MNC, see 3GPP TS 23.003[3]. It may be used to apply roaming based features.
Equivalent PLMN List (See 7.3.151)	Equivalent-PLMN-List	O	This Information Element shall contain the equivalent PLMN list of which the MME/SGSN requests the corresponding CSG Subscription data.
RAT Type (See 7.3.13)	RAT-Type	M	This Information Element contains the radio access type the UE is using. See section 7.3.13 for details.
SGSN number (See 7.3.102)	SGSN-Number	C	This Information Element contains the ISDN number of the SGSN, see 3GPP TS 23.003 [3]. It shall be present when the message is sent on the S6d interface and the SGSN supports LCS or SMS functionalities or the Gs interface. It may be present when the message is sent on the S6a interface and the requesting node is a combined MME/SGSN.
Homogeneous Support of IMS Voice Over PS Sessions	Homogeneous-Support-of-IMS-Voice-Over-PS-Sessions	O	This Information Element, if present, indicates whether or not "IMS Voice over PS Sessions" is supported homogeneously in all TAs or RAs in the serving node (MME or SGSN or combined MME/SGSN). The value "SUPPORTED" indicates that there is support for "IMS Voice over PS Sessions" in all TAs or RAs. The value "NOT_SUPPORTED" indicates that theres is not support for "IMS Voice over PS Sessions" in any of the TAs or RAs.
V-GMLC address	GMLC-Address	C	This Information Element shall contain, if available, the IPv4 or IPv6 address of the V-GMLC associated with the serving node.
Active APN	Active-APN	O	This Information Element, if present, contains the list of active APNs stored by the MME or SGSN, including the identity of the PDN GW assigned to each APN. For the case of explicitly subscribed APNs, the following information shall be present: - Context-Identifier: context id of subscribed APN in use - Service-Selection: name of subscribed APN in use - MIP6-Agent-Info: including PDN GW identity in use for subscribed APN - Visited-Network-Identifier: identifies the PLMN where the PDN GW was allocated For the case of the Wildcard APN, the following information shall be present: - Context-Identifier: context id of the Wildcard APN - Specific-APN-Info: list of APN-in use and related PDN GW identity when the subscribed APN is the wildcard APN It may be present when MME or SGSN needs to restore PDN GW data in HSS due to a Reset procedure.
UE SRVCC Capability	UE-SRVCC-Capability	C	This information element shall indicate if the UE supports or does not support the SRVCC capability and shall be present if the MME or the SGSN supports SRVCC and this information is available to the MME or the SGSN.
MME Number for MT SMS	MME-Number-for-MT-SMS	C	This Information Element contains the ISDN number of the MME to route SMS to the UE through the MME, see 3GPP TS 23.003 [3]. It shall be present when the MME supports SMS in MME and wishes to provide SMS in MME.

SMS Register Request	SMS-Register-Request	C	This information element is used to inform the HSS if the MME needs to be registered for SMS, prefers not to be registered for SMS or has no preference. It shall be present when the MME supports SMS in MME and requests to be registered for SMS.

Table 5.2.1.1.1/2: Update Location Answer

Information element name	Mapping to Diameter AVP	Cat.	Description
Supported Features (See 3GPP TS 29.229 [9])	Supported-Features	O	If present, this information element shall contain the list of features supported by the origin host.
Result (See 7.4)	Result-Code / Experimental-Result	M	This IE shall contain the result of the operation. The Result-Code AVP shall be used to indicate success / errors as defined in the Diameter Base Protocol. The Experimental-Result AVP shall be used for S6a/S6d errors. This is a grouped AVP which shall contain the 3GPP Vendor ID in the Vendor-Id AVP, and the error code in the Experimental-Result-Code AVP. The following errors are applicable: - User Unknown - Unknown EPS Subscription - RAT Not Allowed - Roaming Not Allowed
Error-Diagnostic	Error-Diagnostic	O	If the Experimental Result indicates "Unknown EPS Subscription", Error Diagnostic may be present to indicate whether or not GPRS subscription data are subscribed (i.e. whether or not Network Access Mode stored in the HSS indicates that only circuit service is allowed). If the Experimental Result indicates "Roaming Not Allowed", and the Update Location is rejected due to ODB, Error Diagnostic may be present to indicate the specific type of ODB.
ULA-Flags (See 7.3.8)	ULA-Flags	C	This Information Element contains a bit mask. See 7.3.8 for the meaning of the bits. It shall be present only when the Result-Code AVP is DIAMETER_SUCCESS.
Subscription Data (See 7.3.2)	Subscription-Data	C	This Information Element shall contain the complete subscription profile of the user. It shall be present if success is reported, unless an explicit "skip subscriber data" indication was present in the request.

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported. Unsupported parameters are not set when sending and are discarded when receiving.
- “Homogeneous Support of IMS Voice Over PS Sessions” is set to “supported” or “not supported” or this IE is not included as described in 3GPP TS 23.401 .

5.2.1.1.2 Detailed behaviour of the MME and the SGSN

The MME shall make use of this procedure to update the MME identity stored in the HSS (e.g. at initial attach, inter MME tracking area update or radio contact after HSS reset).

The SGSN shall make use of this procedure to update the SGSN identity stored in the HSS (e.g. at initial attach, inter SGSN routing area update or radio contact after HSS reset).

The MME shall make use of this procedure to request SMS data and and to become registered for SMS.

A combined MME/SGSN which uses different Diameter Identities for the MME and SGSN parts shall not send a second ULR when in a first ULA the ULA-Flag "Separation Indication" was not set.

For UEs receiving emergency services, in which the UE was not successfully authenticated, the MME or SGSN shall not make use of the Update Location procedure.

If the Update Location request is to be sent due to an inter node (SGSN to MME) update and the previous SGSN is a Gn/Gp SGSN, the MME shall set the "Single-Registration-Indication" flag in the ULR-Flags information element in the request.

If the Update Location request is to be sent due to an initial attach, the MME or SGSN shall set the "Initial-Attach-Indicator" flag in the ULR-Flags information element in the request.

A combined MME/SGSN shall set the "Skip Subscriber Data" flag in the ULR-Flags if subscriber data are already available due to a previous location update.

A combined MME/SGSN that has chosen the option to include the SGSN Number within ULR sent over S6a shall be prepared to receive a single subscription data update message (IDR or DSR) from the HSS when the subscription data is modified.

If the MME or SGSN knows about the homogeneity of the support of IMS Voice over PS Sessions in all TAs or RAs associated to that serving node (i.e., it is supported in all the TA/RAs or it is not supported in any of the TA/RAs), it shall include this indication to the HSS in the "Homogeneous Support of IMS Voice over PS Sessions" IE.

The MME or SGSN may include dynamic APN and PGW ID data in the list of Active-APN AVPs, in order to restore this information in the HSS after a Reset procedure.

The MME/SGSN may include an equivalent PLMN list to request the CSG Subscription data of the equivalent PLMNs.

A standalone MME shall not indicate its support for any SGSN specific features, and it shall not request explicitly the download of GPRS data (via the GPRS-Subscription-Data-Indicator flag; see clause 7.3.7). A standalone MME that does not support the "SMS in MME" feature shall not provide its MME Number for MT SMS, "SMS only" indication or SMS Registraton Request and therefore not indicate its support for any SMS related features (such as ODB or barring services).

For a standalone MME or SGSN, if EPS or GPRS subscription data is received, the standalone MME or SGSN shall replace all of the EPS or GPRS subscription data of the user in the MME or SGSN. Any optional EPS or GPRS data not received, but stored in the standalone MME or SGSN, shall be deleted.

For a combined MME/SGSN, if EPS subscription data of the user is received, it shall replace all of the EPS subscription data of the user. Any optional EPS data not received by the combined MME/ SGSN, but stored in the MME/SGSN, shall be deleted.

For a combined MME/SGSN, if GPRS subscription data of the user is received, it shall replace all of the GPRS subscription data of the user. Any optional GPRS data not received by the combined MME/ SGSN, but stored in the MME/SGSN, shall be deleted.

When receiving an Update Location response from the HSS, the MME or SGSN shall check the result code. If it indicates success the MME or SGSN shall store the received subscription profile (if any), and it shall store the HSS identity as received in the Origin-Host AVP.

If an Additional MSISDN (A-MSISDN) is available in the subscription data and downloaded in the A-MSISDN AVP to the MME/SGSN in an Update Location and if the MME or SGSN supports the additional MSISDN feature, the MME or SGSN shall use the Additional MSISDN as C-MSISDN.

For UEs receiving emergency services (i.e. emergency attached UEs or normal attached UEs with a UE Requested PDN Connection for emergency services), and if the MME or SGSN supports emergency services for users in limited service state, the MME or SGSN shall proceed even if the Update Location procedure fails (e.g. authenticated users with roaming restrictions or RAT-Type restrictions in HSS).

When receiving GPRS-Subscription-Data AVP in the response, the SGSN or combined MME/SGSN shall delete all the stored PDP-Contexts, if there are any, and then store all the received PDP-Contexts.

When receiving the APN-Configuration-Profile AVP in a ULA, the MME or SGSN shall delete all the stored APN-Configurations, if there are any, and then store all the received APN-Configurations.

For each of the received APN-Configurations in the APN-Configuration-Profile, if both the MIP6-Agent-Info and the PDN-GW-Allocation-Type AVPs are absent in the APN-Configuration AVP, the MME or SGSN shall perform the

PGW selection (static or dynamic) according to the local configuration. If MIP6-Agent-Info is present, and PDN-GW-Allocation-Type is not present, this means that the PDN GW address included in MIP6-Agent-Info has been statically allocated. If the MIP6-Agent-Info contains an FQDN of the PDN GW, the MME shall retrieve the PGW PLMN ID from the MIP-Home-Agent-Host AVP within the MIP6-Agent-Info AVP.

If the MME/SGSN supports interworking with Gn/Gp-SGSNs, it shall ensure that the context identifier sent over GTPv1 for each of the received APN-Configurations is within the range of 0 and 255.

NOTE 1: If the MME/SGSN receives from HSS a Contex-Identifier value higher than 255, how this value is mapped to a value between 0 and 255 is implementation specific.

If the subscriber is not roaming and the SIPTO-Permission information for an APN is present, the MME or SGSN shall allow SIPTO for that APN only if the SIPTO-Permission information indicates so.

If the subscriber is not roaming and the SIPTO-Permission information for an APN is not present, the MME or SGSN may allow SIPTO for that APN.

If the subscriber is roaming and the SIPTO-Permission information for an APN is present, the MME or SGSN shall allow SIPTO for that APN only if the SIPTO-Permission information indicates so and the VPLMN Dynamic Address is allowed and the MME or SGSN selects a PDN GW in the VPLMN.

If the subscriber is roaming and the SIPTO-Permission information for an APN is not present, the MME or SGSN shall not allow SIPTO for that APN.

NOTE 2: Based on local configuration, the MME or SGSN can determine not to allow SIPTO for an APN, regardless if the SIPTO-Permission information is present.

If MPS-Priority AVP is present and the UE is subscribed to the eMLPP or 1x RTT priority service in the CS domain as indicated by the MPS-CS-Priority bit of the AVP, the MME shall allow the UE to initiate the RRC connection with higher priority than other normal UEs during CS Fallback procedure. If the MPS-Priority AVP is present and the UE is subscribed to MPS in the EPS domain as indicated by the MPS-EPS-Priority bit of the AVP, the MME shall allow the UE to initiate the RRC connection with higher priority than other normal UEs.

If the subscriber is not roaming, the MME or SGSN may allow or prohibit the UE to use LIPA as indicated by LIPA-Permission for a specific APN.

If the subscriber is roaming and the VPLMN-LIPA-Allowed AVP indicates that the UE is not allowed to use LIPA in the VPLMN where the UE is attached, the MME or SGSN shall not provide LIPA for the UE and shall not consider the LIPA-Permission AVP. If the VPLMN-LIPA-Allowed AVP indicates that the UE is allowed to use LIPA in the VPLMN, the MME or SGSN may allow or prohibit the UE to use LIPA as indicated by LIPA-Permission for a specific APN. The VPLMN-Dynamic-Address-Allowed AVP shall not be considered if it is received when the MME or SGSN establishes a PDN connection with LIPA.

If the LIPA-Permission information for an APN indicates LIPA only, the MME or SGSN shall only allow LIPA for that APN via the authorized CSGs according to the CSG Subscription Data. If the LIPA-Permission information for an APN indicates LIPA prohibited, the MME or SGSN shall not allow LIPA for that APN. If the LIPA-Permission information for an APN indicates LIPA conditional, the MME or SGSN shall allow non LIPA, and LIPA for that APN via the authorized CSGs according to the CSG Subscription Data. If the LIPA-Permission AVP is not present for a specific APN, the APN shall not be allowed to use LIPA.

The LIPA-Permission information for the Wildcard APN shall apply to any APN that is not explicitly present in the subscription data.

The SIPTO-Permission information for the Wildcard APN shall apply to any APN that is not explicitly present in the subscription data.

If the subscription data received for a certain APN indicates that the APN was authorized as a consequence of having the Wildcard APN in the user subscription in HSS, then the MME shall not store this APN data beyond the lifetime of the UE session and the MME shall delete them upon disconnection of the UE.

If the MME supports the Relay Node functionality (see 3GPP TS 36.300 [40]) and the subscription data indicates that the subscriber is not a relay, the MME shall reject the attach request from a device attempting to attach to EPS as a Relay Node. If a device requests to be attached to EPS as an UE, the MME shall proceed with the attach procedure regardless of the content of the Relay Node Indicator.

If trace data are received in the subscriber data, the MME or SGSN shall start a Trace Session. For details, see 3GPP TS 32.422 [23].

If the Ext-PDP-Type AVP is present in the PDP-Context AVP, the SGSN or combined MME/SGSN shall ignore the value of the PDP-Type AVP.

If the subscriber is not roaming and the Subscribed-Periodic-RAU-TAU-Timer information is present, the MME or SGSN shall allocate the subscribed value to the UE as periodic RAU or TAU timer. If the subscriber is roaming and the Subscribed-Periodic-RAU-TAU-Timer information is present, the MME or SGSN may use the subscribed periodic RAU/TAU timer value as an indication to decide for allocating a locally configured periodic RAU/TAU timer value to the UE.

If the MME supports the "SMS in MME" feature and the UE has requested a combined EPS/IMSI attach or Combined TA/LA Update, as described in 3GPP TS 23.272 [44] and the MME is not currently registered for SMS, the MME requests to be registered for SMS by indicating its MME Number for SMS in the request, including SMS-Register-Request AVP and the SMS-Only-Indication flag set in the ULR-Flags AVP if UE indicates "SMS only".

If the HSS provides the MME with SMS data in the ULA and the ULA-Flags is received with "MME Registered for MT SMS" flag set, the MME shall store this data for providing SMS in MME service and consider itself registered for SMS.

If the SGSN supports the "SMS in SGSN" feature as specified in 3GPP TS 23.060 [12], clause 5.3.18, and wishes to provide SMS via SGSN it shall set the "SMS in SGSN" flag in the Feature-List AVP. If the UE has indicated "SMS-Only" this shall be indicated to the HSS setting the SMS-Only–Indication flag in the ULR-Flags AVP.

NOTE: the setting of the "SMS in SGSN" feature bit reflects the "SMS in SGSN Offered" as described in stage 2 above.

If the SMS-In-SGSN-Allowed-Indication flag is set in the received Subscription-Data-Flags AVP, the SGSN shall store the subscription data for providing SMS in SGSN service.

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.
- The local configuration is performed by the “dynamic” PGW selection..

5.2.1.1.3 Detailed behaviour of the HSS

When receiving an Update Location request the HSS shall check whether subscription data exists for the IMSI.

If the HSS determines that there is not any type of subscription for the IMSI (including EPS, GPRS and CS subscription data), a Result Code of DIAMETER_ERROR_USER_UNKNOWN shall be returned.

If the Update Location Request is received over the S6a interface, and the subscriber has not any APN configuration, the HSS shall return a Result Code of DIAMETER_ERROR_UNKNOWN_EPS_SUBSCRIPTION.

If the Update Location Request is received over the S6d interface, and the subscriber has neither an APN configuration profile nor GPRS subscription data, the HSS shall return a Result Code of DIAMETER_ERROR_UNKNOWN_EPS_SUBSCRIPTION.

When sending DIAMETER_ERROR_UNKNOWN_EPS_SUBSCRIPTION, an Error Diagnostic information may be added to indicate whether or not GPRS subscription data are subscribed (i.e. whether or not Network Access Mode stored in the HSS indicates that only circuit service is allowed).

The HSS shall check whether the RAT type the UE is using is allowed. If it is not, a Result Code of DIAMETER_ERROR_RAT_NOT_ALLOWED shall be returned.

The HSS shall check whether roaming is not allowed in the VPLMN due to ODB. If so a Result Code of DIAMETER_ERROR_ROAMING_NOT_ALLOWED shall be returned. When this error is sent due to the MME or

SGSN not supporting a certain ODB category, an Error Diagnostic information element may be added to indicate the type of ODB; if this error is sent due to the ODB indicating "Barring of Roaming", Error Diagnostic shall not be included.

If the Update Location Request is received over the S6a interface, the HSS shall send a Cancel Location Request with a Cancellation-Type of MME_UPDATE_PROCEDURE (CLR; see chapter 7.2.7) to the previous MME (if any) and replace the stored MME-Identity with the received value (the MME-Identity is received within the Origin-Host AVP). The HSS shall reset the "UE purged in MME" flag. If the "Single-Registration-Indication" flag was set in the received request, the HSS shall send a Cancel Location Request with a Cancellation-Type of SGSN _UPDATE_PROCEDURE to the SGSN (MAP Cancel Location), and delete the stored SGSN address and SGSN number. If the "Initial-Attach-Indicator" flag was set in the received request, and the "Single-Registration-Indication" flag was not set, the HSS shall send a Cancel Location Request with a Cancellation-Type of INITIAL_ATTACH_PROCEDURE (CLR; see chapter 7.2.7, or MAP Cancel Location) to the SGSN if there is an SGSN registration.

If the Update Location Request is received over the S6d interface, the HSS shall send a Cancel Location Request with a Cancellation-Type of SGSN_UPDATE_PROCEDURE (CLR; see chapter 7.2.7, or MAP Cancel Location) to the previous SGSN (if any) and replace the stored SGSN-Identity with the received value (the SGSN-Identity is received within the Origin-Host AVP). The HSS shall reset the "UE purged in SGSN" flag. If the "Initial-Attach-Indicator" flag was set in the received request, the HSS shall send a Cancel Location Request with a Cancellation-Type of INITIAL_ATTACH_PROCEDURE (CLR; see chapter 7.2.7) to the MME if there is an MME registration.

When the HSS receives the Update Location Request, if a 15th digit of the IMEI AVP is received, the HSS may discard the digit.

If the Update Location Request includes the list of active APNs, the HSS shall delete all the stored dynamic PDN GW information, if there are any, and then replace them by the PDN GW information received in the list of Active-APN AVPs.

If the Update Location Request includes an equivalent PLMN list, the HSS shall return the CSG list (if any) for each equivalent PLMN to the MME with the subscription data, and Visited-PLMN-Id AVP shall be present in the CSG-Subscription-Data AVP to indicate the corresponding PLMN. If there is no equivalent PLMN list received, the HSS may not include Visited-PLMN-Id AVP in the CSG-Subscription-Data AVP, and the CSG-Subscription-Data AVP shall contain the CSG subscription data of the registered PLMN of the MME or the SGSN.

If the Update Location Request is received over the S6a interface for a user for which the URRP-MME parameter is set in the HSS, the HSS shall clear the URRP-MME parameter and send an indication to the corresponding Service Related Entities.

If the Update Location Request is received over the S6d interface for a user for which the URRP-SGSN parameter is set in the HSS, the HSS shall clear the URRP-SGSN parameter and send an indication to the corresponding Service Related Entities.

If no result code has been sent to the MME or SGSN so far, the HSS shall include the subscription data in the ULA command according to the ULR-Flags and the supported/unsupported features of the MME or SGSN, unless an explicit "skip subscriber data" indication has been received in the request, and shall return a Result Code of DIAMETER_SUCCESS.

When the APN-Configuration-Profile AVP is present in the Subscription-Data AVP sent within a ULA, the AVP shall contain at least the default APN Configuration and a Context-Identifier AVP that identifies the per subscriber's default APN configuration. The default APN Configuration shall not contain the Wildcard APN (see 3GPP TS 23.003 [3], clause 9.2); the default APN shall always contain an explicit APN.

The GPRS Subscription data (if available in the HSS) shall only be present in the ULA command if it was indicated by the serving node in the ULR-Flags AVP (see clause 7.3.7), or when the subscription data is returned by a Pre-Rel-8 HSS (via an IWF) or when the Update Location Request is received over the S6d interface and there is no APN configuration profile stored for the subscriber.

The HSS shall use the indication received in the GPRS-Subscription-Data-Indicator for future use in the subscriber data update procedures.

The HSS shall store the new terminal information and/or the new UE SRVCC capability, if they are present in the request. If the UE SRVCC capability is not present, the HSS shall store that it has no knowledge of the UE SRVCC capability.

If the MME/SGSN indicates support of the Additional-MSISDN feature and an additional MSISDN (A-MSISDN) is available in the subscription data, the HSS shall send the provisioned additional MSISDN together with the MSISDN.

If the MME/SGSN does not support the Additional-MSISDN feature, the HSS shall populate the MSISDN AVP either with the subscribed MSISDN or the subscribed additional MSISDN based on operator policy and availability.

NOTE: When the MME/SGSN does not support the Additional-MSISDN feature, the MME/SGSN will use the MSISDN from the MSISDN AVP as C-MSISDN.

LCS-Info, Teleservice-List and Call-Barring-Info data shall be included according to the list of supported features indicated by the serving node (see clause 7.3.10).

If the HSS supports the "SMS in MME" feature and receives the indication that the MME supports the "SMS in MME" feature and requests to be registered for SMS by including the MME Number for MT SMS, SMS-Register-Request AVP and/or setting the SMS-Only-Indication flag in the ULR-Flags AVP if indicated from the UE, the HSS shall determine if SMS can be provided via the MME as described in 3GPP TS 23.272 [44]. If SMS in MME is accepted the HSS shall register the MME for MT SMS, store the "MME number for MT SMS" as the corresponding MSC number to be used for MT SMS and return an indication of MME registered for SMS in ULA-Flags AVP.

If the MME is successfully registered for SMS the HSS shall download the available SMS related subscription data that may comprise SMS teleservice, MSISDN, ODB and barring services for SMS according to supported features.

If the HSS supports the "SMS in SGSN" feature as described in 3GPP TS 23.060 [12], clause 5.3.18 and receives the indication from the SGSN that it supports "SMS in SGSN" feature, and the PS subscriber data allow for SMS services (e.g. the subscription information indicates "PS and SMS-Only"), the HSS may indicate in the ULA that "SMS in SGSN" is allowed to the SGSN and shall handle MT SMS as described in 3GPP TS 23.060 [12], clause 5.3.18.

The HSS may use the indication received in the Node-Type-Indicator for future use in the subscriber data update procedures.

Subscriber-Status AVP shall be present in the Subscription-Data AVP when sent within a ULA. If the value "OPERATOR_DETERMINED_BARRING" is sent, the Operator-Determined-Barring AVP or HPLMN-ODB AVP shall also be present in the Subscription-Data AVP, or vice versa.

Access-Restriction-Data AVP shall be present within the Subscription-Data AVP sent within a ULA if at least one of the defined restrictions applies.

The AMBR AVP shall be present in the Subscription-Data AVP when the APN-Configuration-Profile AVP is sent within a ULA (as part of the Subscription-Data AVP) and may be present in the Subscription-Data AVP when the GPRS-Subscription-Data AVP is present.

The EPS-Subscribed-QoS-Profile AVP and the AMBR AVP shall be present in the APN-Configuration AVP when the APN-Configuration AVP is sent in the APN-Configuration-Profile AVP and when the APN-Configuration-Profile AVP is sent within a ULA (as part of the Subscription-Data AVP).

For those APNs that have been authorized as a consequence of having the Wildcard APN in the user subscription, the HSS shall include the specific APN name and associated PDN-GW identity inside the APN context of the Wildcard APN. This indicates to the MME that the particular APN shall not be cached in the MME and it shall be deleted when the UE session is terminated.

If a Result Code of DIAMETER_SUCCESS is returned, the HSS shall set the Separation Indication in the response.

If the HSS receives an indication in the ULR command about the homogeneous support of IMS Voice over PS Sessions in all TA/RAs associated to a serving node, it may use this information in the future in order to skip the T-ADS data retrieval, as described in clause 5.2.2.1 (IDR/IDA commands).

Subscribed-VSRVCC AVP shall be present within the Subscription-Data AVP sent within a ULA only if the user is subscribed to the SRVCC and vSRVCC.

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.1.2 Cancel Location

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.1.2.1 General

The Cancel Location Procedure shall be used between the HSS and the MME and between the HSS and the SGSN to delete a subscriber record from the MME or SGSN. The procedure shall be invoked by the HSS and is used:

- to inform the MME or SGSN about the subscriber's subscription withdrawal, or a change in the subscriber profile that does not allow access to EPC anymore, or
- to inform the MME or SGSN about an ongoing update procedure i.e. MME or SGSN change or
- to inform the MME or SGSN about an initial attach procedure.

This procedure is mapped to the commands Cancel-Location-Request/Answer (CLR/CLA) in the Diameter application specified in chapter 7.

Table 5.2.1.2.1/1 specifies the involved information elements for the request.

Table 5.2.1.2.1/2 specifies the involved information elements for the answer.

Table 5.2.1.2.1/1: Cancel Location Request

Information element name	Mapping to Diameter AVP	Cat.	Description
IMSI	User-Name (See IETF RFC 3588 [4])	M	This information element shall contain the user IMSI, formatted according to 3GPP TS 23.003 [3], clause 2.2.
Supported Features (See 3GPP TS 29.229 [9])	Supported-Features	O	If present, this information element shall contain the list of features supported by the origin host.
Cancellation Type (See 7.3.24)	Cancellation-Type	M	Defined values that can be used are: - MME-Update Procedure, - SGSN-Update Procedure, - Subscription Withdrawal, - Update Procedure_IWF, - Initial Attach Procedure.
CLR Flags (See 7.3.152)	CLR-Flags	O	This Information Element contains a bit mask. See 7.3.152 for the meaning of the bits and the condition for each bit to be set or not.

Table 5.2.1.2.1/2: Cancel Location Answer

Information element name	Mapping to Diameter AVP	Cat.	Description
Supported Features (See 3GPP TS 29.229 [9])	Supported-Features	O	If present, this information element shall contain the list of features supported by the origin host.
Result (See 7.4)	Result-Code / Experimental-Result	M	The result of the operation. The Result-Code AVP shall be used to indicate success / errors as defined in the Diameter Base Protocol.

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported. Unsupported parameters are not set when sending and are discarded when receiving.
- No description is applicable for SGSN (as defined above).

5.2.1.2.2 Detailed behaviour of the MME and the SGSN

When receiving a Cancel Location request the MME or SGSN shall check whether the IMSI is known.

If it is not known, a result code of DIAMETER_SUCCESS is returned.

If it is known, the MME or SGSN shall check the Cancellation Type and act accordingly.

If the Cancellation Type is "Subscription Withdrawal", the MME or SGSN shall delete the subscription data and detach the UE; in addition, if the Reattach-Required flag is set, the MME or SGSN shall indicate to the UE to initiate an immediate re-attach procedure, as described in 3GPP TS 23.401 [2] and 3GPP TS 23.060 [12]. A result code of DIAMETER_SUCCESS shall be returned.

If a cancellation type of "Initial Attach Procedure" is received, the MME or SGSN shall not delete the subscription data. For details see 3GPP TS 23.401[2] and 3GPP TS 23.060[12]. If the MME receives this cancelation type, and it is registered for SMS, it shall consider itself as unregistered for SMS. Also in this case a result code of DIAMETER_SUCCESS shall be returned.

When a UE is served by a single combined MME/SGSN for both E-UTRAN and non-E-UTRAN access, the combined MME/SGSN shall check the Cancellation-Type. If it indicates Subscription Withdrawal or Update Procedure_IWF, the CLR is processed both in the MME part and in the SGSN part of the combined node. If it indicates Initial Attach Procedure, and if the CLR-Flags AVP is received and supported by the combined MME/SGSN, the CLR is processed only in the affected part of the combined node as indicated by the "S6a/S6d-Indicator" flag in the CLR-Flags AVP. Otherwise, the CLR is processed only in the affected part of the combined node and subscription data are kept for the not affected part.

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

5.2.1.2.3 Detailed behaviour of the HSS

The HSS shall make use of this procedure when the subscriber’s subscription is withdrawn by the HSS operator and when the HSS detects that the UE has moved to a new MME or SGSN area.

The HSS shall include a cancellation type of "Subscription Withdrawal" if the subscriber’s subscription is withdrawn by the operator and shall include a cancellation type of "MME Update Procedure" if the UE moved to a new MME area and shall include a cancellation type of "SGSN Update Procedure" if the UE moved to a new SGSN area, and shall include a cancellation type of "Initial Attach Procedure" if the cancel location is initiated due to an Initial Attach from the UE, and shall include a CLR-Flags with the "S6a/S6d-Indicator" flag indicating the affected part of the combined node if the cancel location is to be sent to a combined MME/SGSN during initial attach procedure.

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.1.3 Purge UE

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.1.3.1 General

The Purge UE Procedure shall be used between the MME and the HSS and between the SGSN and the HSS to indicate that the subscriber's profile has been deleted from the MME or SGSN either by an MMI interaction or automatically, e.g. because the UE has been inactive for several days.

This procedure is mapped to the commands Purge-UE-Request/Answer (PUR/PUA) in the Diameter application specified in chapter 7.

Table 5.2.1.3.1/1 specifies the involved information elements for the request.

Table 5.2.1.3.1/2 specifies the involved information elements for the answer.

Table 5.2.1.3.1/1: Purge UE Request

Information element name	Mapping to Diameter AVP	Cat.	Description
IMSI	User-Name (See IETF RFC 3588 [4])	M	This information element shall contain user IMSI, formatted according to 3GPP TS 23.003 [3], clause 2.2.
Supported Features (See 3GPP TS 29.229 [9])	Supported-Features	O	If present, this information element shall contain the list of features supported by the origin host.
PUR-Flags (See 7.3.149)	PUR-Flags	O	If present, this Information Element shall contain a bitmask. See section 7.3.149 for the meaning of the bits.

Table 5.2.1.3.1/2: Purge UE Answer

Information element name	Mapping to Diameter AVP	Cat.	Description
Supported Features (See 3GPP TS 29.229 [9])	Supported-Features	O	If present, this information element shall contain the list of features supported by the origin host.
Result (See 7.4)	Result-Code / Experimental-Result	M	This IE shall contain the result of the operation. The Result-Code AVP shall be used to indication success / errors as defined in the Diameter Base Protocol. The Experimental-Result AVP shall be used for S6a/S6d errors. This is a grouped AVP which shall contain the 3GPP Vendor ID in the Vendor-Id AVP, and the error code in the Experimental-Result-Code AVP. The following errors are applicable: - User Unknown
PUA-Flags (See 7.3.48)	PUA-Flags	C	This Information Element shall contain a bit mask. See section 7.3.48 for the meaning of the bits. It shall be present only when the Result-Code AVP is DIAMETER_SUCCESS.

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- No description is applicable for SGSN (as defined above).
- The description hatched with gray is unsupported.

5.2.1.3.2 Detailed behaviour of the MME and the SGSN

The MME shall make use of this procedure to set the "UE Purged in the MME" flag in the HSS when the subscription profile is deleted from the MME database due to MMI interaction or after long UE inactivity.

The SGSN shall make use of this procedure to set the "UE Purged in SGSN" flag in the HSS when the subscription profile is deleted from the SGSN database due to MMI interaction or after long UE inactivity.

The combined MME/SGSN shall make use of this procedure to set the "UE Purged in MME" and "UE Purged in SGSN" flags in the HSS when the subscription profile is deleted from the common MME/SGSN database due to MMI interaction or after long UE inactivity on all registered accesses. If the HSS has indicated support for the Partial Purge feature (see clause 7.3.10), the combined MME/SGSN may also indicate to the HSS a Purge of the UE in only one of the serving nodes in the combined node (either in the MME or in the SGSN).

When receiving a Purge UE response from the HSS the MME shall check the Result Code. If it indicates success, the MME shall check the PUA flag "freeze M-TMSI", and if set freeze the M-TMSI i.e. block it for immediate re-use.

When receiving a Purge UE response from the HSS the SGSN shall check the Result Code. If it indicates success, the SGSN shall check the PUA flag "freeze P-TMSI", and if set freeze the P-TMSI i.e. block it for immediate re-use.

When receiving a Purge UE response from the HSS the combined MME/SGSN shall check the Result Code. If it indicates success, the combined MME/SGSN shall check the PUA flag "freeze M-TMSI" and "freeze P-TMSI", and if set freeze the M-TMSI and/or the P-TMSI i.e. block it for immediate re-use.

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

5.2.1.3.3 Detailed behaviour of HSS

When receiving a Purge UE request the HSS shall check whether the IMSI is known.

If it is not known, a result code of DIAMETER_ERROR_USER_UNKNOWN shall be returned.

If it is known, the HSS shall set the result code to DIAMETER_SUCCESS and compare the received identity in the Origin-Host with the stored MME-Identity and with the stored SGSN-Identity.
If the received identity matches the stored MME-identity and the stored SGSN-Identity, then:

- if the HSS supports the Partial Purge feature (see clause 7.3.10), and the combined MME/SGSN indicated that the UE was purged in only one of the serving nodes, the HSS shall set the PUA flags according to the serving node where the purge was done (i.e., either "freeze M-TMSI" if the purge was done in the MME, or "freeze P-TMSI" if the purge was done in the SGSN); similarly, the HSS shall set either the "UE purged in MME" flag, or "UE purged in SGSN" flag, accordingly;

- if the HSS does not support the Partial Purge feature, or the combined MME/SGSN did not indicate that the UE was purged in only one of the serving nodes, the HSS shall set the PUA flags "freeze M-TMSI" and "freeze P-TMSI" in the answer message and set the flag "UE purged in MME" and "UE purged in SGSN";

If the received identity matches the stored MME-identity but not the stored SGSN-identity, the HSS shall set the PUA flag "freeze M-TMSI" and clear the PUA flag "freeze P-TMSI" in the answer message and set the flag "UE purged in MME";
If the received identity matches the stored SGSN-identity but not the stored MME-identity, the HSS shall set the PUA flag "freeze P-TMSI" and clear the PUA flag "freeze M-TMSI" in the answer message and set the flag "UE purged in SGSN";
If the received identity does not match the stored MME-identity and does not match the stored SGSN-identity, the HSS shall clear the PUA flags "freeze M-TMSI" and "freeze P-TMSI in the answer message.

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.2 Subscriber Data Handling Procedures

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.2.1 Insert Subscriber Data

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.2.1.1 General

The Insert Subscriber Data Procedure shall be used between the HSS and the MME and between the HSS and the SGSN for updating and/or requesting certain user data in the MME or SGSN in the following situations:

- due to administrative changes of the user data in the HSS and the user is now located in an MME or SGSN, i.e. if the user was given a subscription and the subscription has changed;
- the operator has applied, changed or removed Operator Determined Barring for this user;
- activate subscriber tracing in the MME or the SGSN;
- to indicate to the MME or SGSN that the HSS has requested to be notified when the UE has become reachable;
- to request from the MME or SGSN the necessary data to support the T-ADS functionality;
- to retrieve location information and/or state information from the MME or the SGSN;
- to retrieve from the MME or the SGSN the Local Time Zone of the location in the visited network where the UE is attached;
- to update the STN-SR (e.g., as a result of an Sh interaction with an SCC-AS).
- to update the MME/SGSN with the identity of a dynamically allocated PDN GW as a result of the first PDN connection establishment associated with an APN over non 3GPP access.
- to indicate to the MME that the HSS has deregistered the MME for SMS.

If the HSS knows that the UE has attached to the same combined MME/SGSN via both the E-UTRAN and UTRAN/GERAN, i.e. the HSS has received the Update Location Request over both the S6a interface and S6d interface respectively with the same SGSN number, the HSS should invoke this procedure for a single time to update and/or request certain user data in the combined MME/SGSN, i.e. the HSS should not invoke this procedure for each of the MME and the SGSN registered respectively.

If the Node-Type-Indicator information has been previously received as cleared in the ULR-Flags and if the MME has not been registered for SMS during update location procedure for the MME, the HSS may skip any change of the SMS related subscription data and consequently does not have to make use of the Insert Subscriber Data procedure to update the SMS subscription data in the MME.

This procedure is mapped to the commands Insert Subscriber Data-Request/Answer (IDR/IDA) in the Diameter application specified in clause 7.

Table 5.2.2.1.1/1 specifies the involved information elements for the request.

Table 5.2.2.1.1/2 specifies the involved information elements for the answer.

Table 5.2.2.1.1/1: Insert Subscriber Data Request

Information element name	Mapping to Diameter AVP	Cat.	Description
IMSI	User-Name (See IETF RFC 3588 [4])	M	This information element shall contain the user IMSI, formatted according to 3GPP TS 23.003 [3], clause 2.2.
Supported Features (See 3GPP TS 29.229 [9])	Supported-Features	O	If present, this information element shall contain the list of features supported by the origin host.
Subscription Data (See 7.3.2)	Subscription-Data	M	This Information Element shall contain the part of the subscription profile that either is to be added to the subscription profile stored in the MME or SGSN or is replacing a part of the subscription profile stored in the MME or SGSN.
IDR Flags (See 7.3.103)	IDR-Flags	C	This Information Element shall contain a bit mask. See 7.3.103 for the meaning of the bits.

Table 5.2.2.1.1/2: Insert Subscriber Data Answer

Information element name	Mapping to Diameter AVP	Cat.	Description
Supported Features (See 3GPP TS 29.229 [9])	Supported-Features	O	If present, this information element shall contain the list of features supported by the origin host.
Result (See 7.4)	Result-Code / Experimental-Result	M	This IE shall contain the result of the operation. Result-Code AVP shall be used to indicate success / errors defined in the Diameter Base Protocol. The Experimental-Result AVP shall be used for S6a/S6d errors. This is a grouped AVP which shall contain the 3GPP Vendor ID in the Vendor-Id AVP, and the error code in the Experimental-Result-Code AVP. The following errors are applicable in this case: - User Unknown
IMS Voice over PS Sessions Supported (See 7.3.106)	IMS-Voice-Over-PS-Sessions-Supported	C	If available to the serving node, this information element shall indicate whether or not "IMS Voice over PS Sessions" is supported by the UE's most recently used TA or RA in the serving node (MME or SGSN or combined MME/SGSN). If the UE is in detached state, this information element shall not be included in the response.
Last UE Activity Time (See 7.3.108)	Last-UE-Activity-Time	C	If available to the serving node, this information element shall contain the time of the last radio contact with the UE. If the UE is in detached state, this information element shall not be included in the response.
RAT Type (See 7.3.13)	RAT-Type	C	If available to the serving node, this information element shall indicate the RAT Type of the access where the UE was present at the time of the last radio contact. If the UE is in detached state, this information element shall not be included in the response.
IDA-Flags (See 7.3.47)	IDA-Flags	C	This Information Element shall contain a bit mask. See 7.3.47 for the meaning of the bits.
EPS-User-State (See 7.3.110)	EPS-User-State	C	This Information Element shall contain the EPS-User State. It shall be present if EPS user state was requested within IDR.
EPS-Location-Information (See 7.3.111)	EPS-Location-Information	C	This Information Element shall contain the EPS-Location Information. It shall be present if EPS location information was requested within IDR.
Local Time Zone (See 7.3.156)	Local-Time-Zone	C	This Information Element shall contain information on the Local Time Zone of the location in the visited network where the UE is attached. It shall be present if the Local Time Zone was requested within IDR.

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- No description is applicable for SGSN (as defined above).
- The description hatched with gray is unsupported. Unsupported parameters are not set when sending and are discarded when receiving.

5.2.2.1.2 Detailed behaviour of the MME and the SGSN

When receiving an Insert Subscriber Data request the MME or SGSN shall check whether the IMSI is known.

If it is not known, a result code of DIAMETER_ERROR_USER_UNKNOWN shall be returned.

If it is known, the MME or SGSN shall replace the specific part of the stored subscription data with the received data, or shall add the received data to the stored data.

When receiving the APN-Configuration-Profile AVP within the Subscription-Data AVP, the MME or SGSN shall check the All-APN-Configurations-Included-Indicator value. If it indicates "All_APN_CONFIGURATIONS_INCLUDED", the MME or SGSN shall delete all stored APN-Configurations and then store all received APN-Configurations. Otherwise, the MME or SGSN shall check the Context-Identifier value of each received APN-Configuration. If the Context-Identifier of a received APN-Configuration matches a Context-Identifier of a stored APN-Configuration, the MME or SGSN shall replace the stored APN-Configuration with the received APN-Configuration. If the Context-Identifier of a received APN-Configuration does not match a Context-Identifier of a stored APN-Configuration, the MME or SGSN shall add the received APN-Configuration to the stored APN-Configurations. If the addition or update of the subscription data succeeds in the MME or SGSN, the Result-Code shall be set to DIAMETER_SUCCESS. The MME or SGSN shall then acknowledge the Insert Subscriber Data message by returning an Insert Subscriber Data Answer.

For each of the received APN-Configurations in the APN-Configuration-Profile, if both the MIP6-Agent-Info and the PDN-GW-Allocation-Type AVPs are absent in the APN-Configuration AVP, the MME or SGSN shall perform the PGW selection (static or dynamic) according to the local configuration. If MIP6-Agent-Info is present, and PDN-GW-Allocation-Type is not present, this means that the PDN GW address included in MIP6-Agent-Info has been statically allocated.

If the MME/SGSN supports interworking with Gn/Gp-SGSNs, it shall ensure that the context identifier sent over GTPv1 for each of the received APN-Configurations is within the range of 0 and 255.

NOTE: If the MME/SGSN receives from HSS a Contex-Identifier value higher than 255, how this value is mapped to a value between 0 and 255 is implementation specific.

If the MME is requested to notify the HSS when the UE becomes reachable, the MME shall set the URRP-MME parameter to indicate the need to inform the HSS about UE reachability, e.g. when the next NAS activity from the UE is detected. If the SGSN is requested to notify the HSS when the UE becomes reachable, the SGSN shall set the URRP-SGSN parameter to indicate the need to inform the HSS about UE reachability, e.g. when the next NAS activity from the UE is detected.

When receiving GPRS-Subscription-Data AVP within the Subscription-Data AVP, the SGSN or combined MME/SGSN shall check the Complete-Data-List-Included-Indicator value. If it indicates "All_PDP_CONTEXTS_INCLUDED", the SGSN or combined MME/SGSN shall delete all stored PDP-Contexts and then store all received PDP-Contexts. Otherwise, the SGSN or combined MME/SGSN shall check the Context-Identifier value of each received PDP-Context. If the Context-Identifier of a received PDP-Context matches a Context-Identifier of a stored PDP-Context, the SGSN or combined MME/SGSN shall replace the stored PDP-Context with the received PDP-Context. If the Context-Identifier of a received PDP-Context does not match a Context-Identifier of a stored PDP-Context, the SGSN or combined MME/SGSN shall add the received PDP-Context to the stored PDP-Contexts.

If the MME or SGSN receives an empty Subscription-Data AVP, it shall take no action with regard to the stored subscription data.

When receiving HPLMN-ODB AVP within the Subscription-Data AVP, the MME or SGSN shall replace stored HPLMN-ODB data (if any) with the received information rather than add the received information to the stored information. Unsupported Barring categories need not be stored.

When receiving Operator-Determined-Barring AVP within the Subscription-Data AVP, the MME or SGSN shall replace stored ODB subscription information (if any) with the received information rather than add the received information to the stored information. Unsupported Barring categories need not be stored.

When receiving Access-Restriction-Data AVP within the Subscription-Data AVP, the MME or SGSN shall replace stored information (if any) with received information rather than add received information to stored information.

When receiving APN-OI-Replacement AVP within the Subscription-Data AVP, the MME or SGSN shall replace the stored information (if any) with the received information.

When receiving Regional-Subscription-Zone-Code AVP within the Subscription-Data AVP, the MME or SGSN shall replace stored Zone Codes (if any) with the received information rather than add the received information to the stored information. MMEs and SGSNs that do not support regional subscription need not store zone codes. If due to regional subscription restrictions or access restrictions the entire SGSN area is restricted, SGSN shall report it to the HSS by returning the "SGSN Area Restricted" indication within the IDA flags.

When receiving CSG-Subscription-Data AVPs within the Subscription-Data AVP the MME or SGSN shall replace all stored information from previously received CSG-Subscription-Data AVPs (if any) with the received information rather than add the received information to the stored information.

When receiving Teleservice-List AVP, Call-Barring-Info, or LCS-Info AVP, the MME or SGSN shall replace stored information (if any) with the received information rather than add the received information to the stored information.

When receiving the IDR-Flags with the "T-ADS Data Request" bit set, and the UE is in attached state, the MME or SGSN or combined MME/SGSN shall return in the IDA message the time stamp of the UE's most recent radio contact and the associated RAT Type, and an indication of whether or not IMS Voice over PS is supported in the current (and most recently used) TA or RA. If the UE is in detached state, the MME or SGSN or combined MME/SGSN shall answer successfully to the T-ADS request from HSS, but it shall not include any of the T-ADS IEs in the response (IMS Voice over PS Sessions Supported, RAT Type and Last UE Activity Time).

When receiving the IDR-Flags with the "EPS User State Request" bit and/or "EPS Location Information Request" bits set the MME or SGSN shall return the corresponding user information to the HSS. If the serving node is a combined MME/SGSN, and the UE is attached via both E-UTRAN and UTRAN/GERAN on the same node, the combined MME/SGSN shall provide the corresponding user information relevant for both MME and SGSN. If the Current Location Request bit was also set and the UE is in idle mode, then the MME or SGSN or combined MME/SGSN shall page the UE in order to return the most up-to-date corresponding user information. If the Current Location Request bit was also set and the UE (attached via E-UTRAN) is in connected mode, then the MME or combined MME/SGSN shall use S1AP Location Reporting Control procedure towards the eNB prior to reporting the E-UTRAN Cell Global Identification in order to return the UE's most up-to-date cell information.

When receiving the IDR-Flags with only the "Current Location Request" bit set (i.e. the "EPS Location Information Request" bit is not set), the MME or SGSN or combined MME/SGSN shall set the Result-Code to DIAMETER_UNABLE_TO_COMPLY.

If the "Local Time Zone Request" bit was set the MME or SGSN if supported shall provide the Local Time Zone corresponding to the location (e.g. TAI or RAI) of the UE to the HSS.

If the MME or SGSN cannot fulfil the received request, e.g. due to a database error or any of the required actions cannot be performed, it shall set the Result-Code to DIAMETER_UNABLE_TO_COMPLY. If subscription data are received, the MME or SGSN shall mark the subscription record "Subscriber to be restored in HSS".

If trace data are received in the subscriber data, the MME or SGSN shall start a Trace Session. For details, see 3GPP TS 32.422 [23].

If the Ext-PDP-Type AVP is present in the PDP-Context AVP, the SGSN or combined MME/SGSN shall ignore the value of the PDP-Type AVP.

When receiving the IDR-Flags with the bit "Remove SMS Registration" set, the MME shall consider itself unregistered for SMS.

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

5.2.2.1.3 Detailed behaviour of HSS

The HSS shall make use of this procedure to replace a specific part of the user data stored in the MME or SGSN with the data sent, or to add a specific part of user data to the data stored in the MME or SGSN. The HSS shall also make use of this procedure to indicate to the MME that it is no longer registered for SMS.

NOTE: When a Cancel Location message is required for other reasons, the use of IDR to indicate that the MME is no longer registered for SMS is not needed (see clause 5.2.1.2).

Subscriber-Status AVP shall be present in the Subscription-Data AVP, sent within IDR, if the current value in the MME or SGSN needs to be changed. To remove all Operator Determined Barring Categories the Subscriber-Status shall be set to "SERVICE_GRANTED". If Subscriber-Status AVP is present and set to OPERATOR_DETERMINED_BARRING, the Operator-Determined-Barring AVP or HPLMN-ODB AVP shall also be present in the Subscription-Data AVP.

Access-Restriction-Data AVP shall be present within the Subscription-Data AVP send within an IDR if the information stored in the MME or SGSN needs to be modified.

APN-OI-Replacement AVP shall be present in the Subscription-Data AVP sent within an IDR, if the UE level APN-OI-Replacement has been added or modified in the HSS.

The APN-Configuration-Profile AVP shall be present in the Subscription-Data AVP sent within an IDR if the Context-Identifier associated with the default APN configuration is changed or at least one APN-Configuration is added or modified by the HSS. If the default APN is changed in the HSS, the APN-Configuration-Profile AVP shall contain the Context-Identifier associated with the default APN and the APN-Configuration AVP for the default APN. The default APN Configuration shall not contain the Wildcard APN (see 3GPP TS 23.003 [3], clause 9.2); the default APN shall always contain an explicit APN.

The EPS-Subscribed-QoS-Profile AVP and the AMBR AVP shall be present in the APN-Configuration AVP when the APN-Configuration AVP is sent in the APN-Configuration-Profile AVP and when the APN-Configuration-Profile AVP is sent within a IDR (as part of the Subscription-Data AVP).

If the GPRS-Subscription-Data-Indicator information has been previously received as set in the ULR-Flags during update location procedure for the SGSN or combined MME/SGSN, the HSS shall make use of this procedure to replace the GPRS Subscription Data stored in the SGSN or combined MME/SGSN with the data sent or to add a PDP-Context to the data stored in the SGSN or combined MME/SGSN.

If the HSS receives a message (e.g. via MAP ATM or Sh Sh-Subs-Notif) from a Service Related Entity (e.g. IP-SM-GW) indicating that the UE is unreachable,

- the HSS shall associate the subscription to UE reachability of the service-related entity to the URRP-MME and the URRP-SGSN parameters (if not already done)
- and if the URRP-MME and/or the URRP-SGSN parameters were not already set (i.e. at least one service-related entity already listed as subscribed), the HSS shall
    - set the URRP-MME and/or URRP-SGSN parameters and
    - send an IDR command to the registered MME and/or to the registered SGSN including the "UE Reachability Request flag" in the IDR Request Flags in order to request the MME and/or SGSN to notify the HSS when the UE becomes reachable again, unless the HSS knows from the previous ULR command that the registered MME and/or the registerd SGSN do not support UE reachability notifications.

If the IDR is sent for the only purpose to request the MME and/or SGSN about the UE reachability status notification, the Subscription-Data AVP shall be included empty.

If the HSS has received a message from a service related entity requesting EPS User State and/or EPS Location Information without the Serving Node Indication IE, the HSS shall set the "EPS User State Request" bit and/or "EPS

Location Information Request" bit respectively in the IDR-Flags. The HSS may optionally also set the "Current Location Request" bit along with the "EPS Location Information Request" bit in the IDR-Flags, if the most up-to-date set of information is needed, unless the HSS knows from the previous ULR command that the registered MME and/or the registered SGSN do not support State/Location Information retrieval. If the IDR is sent only for the purpose of requesting the MME or the SGSN User State or Location Information, the Subscription-Data AVP included shall be empty.

If the HSS has received a message from an AS requesting the current access network's support status of "IMS Voice over PS Sessions", and there is no indication about homogeneous support of IMS Voice over PS Sessions in all the serving nodes currently registered in HSS for the UE, the HSS shall set the "T-ADS Data Request flag" in the IDR Request Flags, unless the HSS knows from the previous ULR command that the registered MME and/or the registered SGSN do not support T-ADS data retrieval. If the IDR is sent for the only purpose to retrieve the "IMS Voice over PS Sessions Supported" indication from the MME or SGSN, the Subscription-Data AVP included shall be empty. If the serving node answers successfully to the T-ADS data request, but it does not include any of the T-ADS Information Elements (IMS Voice over PS Sessions Supported, RAT Type and Last UE Activity Time), the HSS shall consider that the support of IMS Voice over PS Sessions is unknown to the serving node (for instance, if the UE is in detached state).

If the HSS has received a message from an AS requesting the Local Time Zone, the HSS shall set the " Local Time Zone Request" bit in the IDR-Flags, unless the HSS knows from the previous ULR command that the registered MME and/or the registered SGSN do not support Local Time Zone retrieval. If the IDR is sent only for the purpose of requesting the Local Time Zone, the Subscription-Data AVP included shall be empty.

If the HSS received an indication in a former ULR command from the MME or SGSN about homogeneous support of IMS Voice over PS Sessions in all TA/RAs associated to that serving node, it may use this information to skip the retrieval of T-ADS data. This can only be done if all the registered serving nodes in HSS for the UE indicated in ULR the same type of homogeneous support (i.e. both serving nodes indicated "SUPPORTED", or both serving nodes indicated "NOT_SUPPORTED"); otherwise, the retrieval of T-ADS data shall be done, to receive the time of the last radio contact with the UE.

All APN and PGW-ID pairs stored in the HSS not associated with an explicit APN subscription, (i.e. the access to that APN has been authorized as a consequence of having the Wildcard APN in the user subscription), shall be included by the HSS inside the APN context of the Wildcard APN, as multiple instances of the Specific-APN-Info AVP.

When receiving an Insert Subscriber Data answer with "SGSN Area Restricted" the HSS shall set the SGSN area restricted flag as "SGSN area restricted".

Subscribed-VSRVCC AVP may be present within the Subscription-Data AVP sent within an ISR only if the user is subscribed to the SRVCC and vSRVCC.

If the HSS determines that the MME shall be unregistered for SMS it shall set the "Remove SMS Registration" bit in the IDR-Flags. If the IDR is sent for the only purpose to indicate that the MME is no longer registered for SMS, the Subscription-Data AVP shall be included empty.

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.2.2 Delete Subscriber Data

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.2.2.1 General

This procedure shall be used between the MME and the HSS and between the SGSN and the HSS, to remove some data of the HSS user profile stored in the MME or SGSN. The procedure shall be invoked by the HSS and it corresponds to the functional level operation Delete Subscriber Data (see 3GPP TS 23.401[2]).

It shall be used to remove:

- all or a subset of the EPS subscription data (APN Configuration Profile) for the subscriber from the MME or SGSN;
- the regional subscription;
- the subscribed charging characteristics;
- Session Transfer Number for SRVCC;
- trace data.

If the HSS knows that the UE has attached to the same combined MME/SGSN via both E-UTRAN and UTRAN/GERAN, i.e. the HSS has received the Update Location Request over both the S6a interface and S6d interface respectively with the same SGSN number, the HSS should invoke this procedure for a single time to remove some or all data of the HSS user profile stored in the combined MME/SGSN, i.e. not invoke this procedure for each of the MME and the SGSN registered respectively.

If the Node-Type-Indicator information has been previously received as cleared in the ULR-Flags and if the MME has not been registered for SMS during update location procedure for the MME, the HSS may skip any removal of the SMS related subscription data and consequently does not have to make use of the Delete Subscriber Data procedure to update the SMS subscription data in the MME.

This procedure is mapped to the commands Delete-Subscriber-Data-Request/Answer (DSR/DSA) in the Diameter application specified in chapter 7.

Table 5.2.2.2.1/1 specifies the involved information elements for the request.

Table 5.2.2.2.1/2 specifies the involved information elements for the answer.

Table 5.2.2.2.1/1: Delete Subscriber Data Request

Information element name	Mapping to Diameter AVP	Cat.	Description
IMSI	User-Name (See IETF RFC 3588 [4])	M	This information element shall contain the user IMSI, formatted according to 3GPP TS 23.003 [3], clause 2.2.
Supported Features (See 3GPP TS 29.229 [9])	Supported-Features	O	If present, this information element shall contain the list of features supported by the origin host.
DSR Flags (See 7.3.25)	DSR-Flags	M	This Information Element shall contain a bit mask. See 7.3.25 for the meaning of the bits.
Trace Reference (See 7.3.64)	Trace-Reference	C	This parameter shall contain the same value as used for the activation of the Trace Session. This element shall be present only if the "Trace Data Withdrawal" bit is set in the DSR-Flags.
Context Identifier (See 7.3.27)	Context-Identifier	C	This parameter shall identify the PDN subscription context or GPRS-PDP context that shall be deleted. This element shall be present only if the "PDN subscription contexts Withdrawal" bit or the "PDP context withdrawal" bit is set in the DSR-Flags. In the "PDN subscription contexts Withdrawal" case, the Context-Identifier shall not be associated with the default APN configuration. For the compatibility with the MAP protocol as defined in the 3GPP TS 29.002 [24], this parameter shall not have a value of zero.
TS Code List (See 7.3.100)	TS-Code	**C**	This parameter shall contain the teleservice codes that are to be deleted from the subscription. This element shall be present only if the "SMS Withdrawal" bit is set in the DSR-Flags and the SMS related teleservice codes are to be deleted.
SS Code List (See 7.3.87)	SS-Code	**C**	This parameter shall contain the supplementary service codes that are to be deleted from the subscription. This element shall be present only if the "SMS Withdrawal" bit is set or the "LCS Withdrawal" bit is set in the DSR-Flags.

Table 5.2.2.2.1/2: Delete Subscriber Data Answer

Information element name	Mapping to Diameter AVP	Cat.	Description
Supported Features (See 3GPP TS 29.229 [9])	Supported-Features	O	If present, this information element shall contain the list of features supported by the origin host.
Result (See 7.4)	Result-Code / Experimental-Result	M	This IE shall contain the result of the operation. The Result-Code AVP shall be used to indicate success / errors as defined in the Diameter Base Protocol. The Experimental-Result AVP shall be used for S6a/S6d errors. This is a grouped AVP which shall contain the 3GPP Vendor ID in the Vendor-Id AVP, and the error code in the Experimental-Result-Code AVP. The following errors are applicable in this case: - User Unknown
DSA Flags (See 7.3.26)	DSA-Flags	C	This Information Element shall contain a bit mask. See 7.3.26 for the meaning of the bits.

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- No description is applicable for SGSN (as defined above).
- The description hatched with gray is unsupported.

5.2.2.2.2 Detailed behaviour of the MME and the SGSN

When receiving a Delete Subscriber Data request, the MME or SGSN shall check whether the IMSI is known.

If it is not known, a result code of DIAMETER_ERROR_USER_UNKNOWN shall be returned.

If it is known, but the Context-Identifier is associated with the default APN configuration, the MME shall not delete the PDN subscription context, and return an error with a Result-Code set to DIAMETER_UNABLE_TO_COMPLY. Otherwise, the MME or SGSN shall delete the corresponding data according to the indication as sent in the request, and acknowledge the Delete Subscriber Data message by returning a Delete Subscriber Data Answer.

If an MME receives a Delete Subscriber Data Request with the "Complete APN Configuration Profile Withdrawal" bit set in the DSR-Flags AVP, it shall return an error with a Result-Code set to DIAMETER_UNABLE_TO_COMPLY.

If the deletion of the subscription data succeeds in the MME or SGSN, the Result-Code shall be set to DIAMETER_SUCCESS.

If the Regional Subscription is deleted from the subscription data, the SGSN shall check for its routing areas whether they are allowed or not. If the entire SGSN area is restricted, SGSN shall report it to the HSS by returning the "SGSN Area Restricted" indication within the DSA flags.

If the EPS Subscription Data is deleted from the subscription data, the MME or SGSN shall check whether all EPS Subscription Data for the subscriber is deleted or if only a subset of the stored EPS Subscription Data for the subscriber is deleted, the MME or SGSN may then deactivate the associated affected active EPS bearers.

If the Subscribed Charging Characteristics are deleted from the subscription data, the Gn/Gp-SGSN shall maintain the existing Subscribed Charging Characteristics throughout the lifetime of the existing MM and PDP contexts, see 3GPP TS 32.251 [33].

If the Subscribed Charging Characteristics are deleted from the subscription data, the MME or S4-SGSN shall maintain the existing Subscribed Charging Characteristics throughout the lifetime of the existing IP CAN bearer, see 3GPP TS 32.251 [33].

If the MME or SGSN cannot fulfil the received request for other reasons, e.g. due to a database error, it shall set the Result-Code to DIAMETER_UNABLE_TO_COMPLY. In this case, the MME or SGSN shall mark the subscription record "Subscriber to be restored in HSS".

If trace data are deleted from the subscription data, the MME or SGSN shall deactivate the Trace Session identified by the trace reference. For details, see 3GPP TS 32.422 [23].

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

5.2.2.2.3 Detailed behaviour of the HSS

The HSS shall make use of this procedure to remove deleted subscription data from the MME or SGSN.

The HSS shall make use of this procedure to remove deleted GPRS Subscription Data from the SGSN or combined MME/SGSN if the GPRS-Subscription-Data-Indicator information has been previously received as set in the ULR-Flags during update location procedure for the MME.

The HSS shall not set the "Complete APN Configuration Profile Withdrawal" bit in the DSR-Flags AVP when sending a Delete Subscriber Data Request to an MME, since the default APN shall always be present in an MME.

When receiving a Delete Subscriber Data Answer with "SGSN Area Restricted" the HSS shall set the SGSN area restricted flag as "SGSN area restricted".

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.3 Authentication Procedures

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.3.1 Authentication Information Retrieval

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.3.1.1 General

The Authentication Information Retrieval Procedure shall be used by the MME and by the SGSN to request Authentication Information from the HSS.

This procedure is mapped to the commands Authentication-Information-Request/Answer (AIR/AIA) in the Diameter application specified in chapter 7.

Table 5.2.3.1.1/1 specifies the involved information elements for the request.

Table 5.2.3.1.1/2 specifies the involved information elements for the answer.

Table 5.2.3.1.1/1: Authentication Information Request

Information element name	Mapping to Diameter AVP	Cat.	Description
IMSI	User-Name (See IETF RFC 3588 [4])	M	This information element shall contain the user IMSI, formatted according to 3GPP TS 23.003 [3], clause 2.2.
Supported Features (See 3GPP TS 29.229 [9])	Supported-Features	O	If present, this information element shall contain the list of features supported by the origin host.
Requested E-UTRAN Authentication Info (See 7.3.11)	Requested-EUTRAN-Authentication-Info	C	This information element shall contain the information related to authentication requests for E-UTRAN.
Requested UTRAN/GERAN Authentication Info (See 7.3.12)	Requested-UTRAN-GERAN Authentication-Info	C	This information element shall contain the information related to authentication requests for UTRAN or GERAN.
Visited PLMN ID (See 7.3.9)	Visited-PLMN-ID	M	This IE shall contain the MCC and the MNC of the visited PLMN, see 3GPP TS 23.003 [3].

Table 5.2.3.1.1/2: Authentication Information Answer

Information element name	Mapping to Diameter AVP	Cat.	Description
Result (See 7.4)	Result-Code / Experimental-Result	M	This IE shall contain the result of the operation. This IE shall contain the Result-Code AVP shall be used to indicate success / errors as defined in the Diameter Base Protocol. The Experimental-Result AVP shall be used for S6a/S6d errors. This is a grouped AVP which shall contain the 3GPP Vendor ID in the Vendor-Id AVP, and the error code in the Experimental-Result-Code AVP. The following errors are applicable in this case: - User Unknown - Unknown EPS Subscription
Error-Diagnostic	Error-Diagnostic	O	If the Experimental Result indicated "Unknown EPS Subscription", Error Diagnostic may be present to indicate whether or not GPRS subscription data are subscribed (i.e. whether or not Network Access Mode stored in the HSS indicates that only circuit service is allowed).
Supported Features (See 3GPP TS 29.229 [9])	Supported-Features	O	If present, this information element shall contain the list of features supported by the origin host.
Authentication Info (See 7.3.17)	Authentication-Info	C	This IE shall contain the Authentication Vectors.

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

5.2.3.1.2 Detailed behaviour of the MME and the SGSN

The MME or SGSN shall make use of this procedure in order to retrieve the Authentication Vectors from the HSS.

If the MME or SGSN supports Emergency services for users in limited service state, and the user's IMSI is not available from the UE, or the user's IMSI is marked as unauthenticated, the MME or SGSN shall not make use of the Authentication Information Retrieval procedure.

If the request is triggered by a synchronization failure during E-UTRAN authentication, the MME or combined MME/SGSN shall include the Re-Synchronization Information in the Requested-EUTRAN-Authentication-Info AVP in the request.

If the request is triggered by a synchronization failure during UTRAN or GERAN authentication, the SGSN or combined MME/SGSN shall include the Re-Synchronization Information in the Requested-UTRAN-GERAN-Authentication-Info AVP in the request.

Re-Synchronization Information shall not be present in both the Requested-EUTRAN-Authentication-Info AVP and the Requested-UTRAN-GERAN-Authentication-Info AVP.

A stand alone MME shall include the Requested-EUTRAN-Authentication-Info AVP and shall not include the Requested-UTRAN-GERAN-Authentication-Info AVP in the request. The Immediate-Response-Preferred AVP should be present if a EUTRAN-Vector is needed for immediate use.

A stand alone SGSN shall not include the Requested-EUTRAN-Authentication-Info AVP and shall include the Requested-UTRAN-GERAN-Authentication-Info AVP in the request. The Immediate-Response-Preferred AVP should be present if a UTRAN/GERAN-Vector is needed for immediate use.

A combined MME/SGSN may include both the Requested-EUTRAN-Authentication-Info AVP and the Requested-UTRAN-GERAN-Authentication-Info AVP in the request. If both the Requested-EUTRAN-Authentication-Info AVP and the Requested-UTRAN-GERAN-Authentication-Info AVP are present in the request, the Immediate-Response-Preferred AVP shall be present if the requested authentication vectors are needed for immediate use. The content of

the Immediate-Response-Preferred AVP shall correspond to the access type which the UE is currently to be authenticated. The Immediate-Response-Preferred AVP shall not be present in both the Requested-EUTRAN-Authentication-Info AVP and the Requested-UTRAN-GERAN-Authentication-Info AVP. The presence of an Immediate-Response-Preferred AVP shall indicate that a vector is needed for immediate use.

When EUTRAN-AVs and UTRAN-AVs or GERAN-AVs are requested, presence of Immediate-Response-Preferred AVP within the Requested-EUTRAN-Authentication-Info AVP shall indicate that EUTRAN-AVs are requested for immediate use in the MME/SGSN; presence of Immediate-Response-Preferred AVP within the Requested-UTRAN-GERAN-Authentication-Info AVP shall indicate that UTRAN-AVs or GERAN-AVs are requested for immediate use in the MME/SGSN. It may be used by the HSS to determine the number of vectors to be obtained from the AuC and the number of vectors downloaded to the MME or SGSN.

When receiving an Authentication Information response from the HSS, the MME or SGSN shall check the Result Code. If it indicates success and Authentication Information is present in the result, the MME or SGSN shall use the received vectors. For details see 3GPP TS 33.401 [5].

If the MME or SGSN supports Emergency services for users in limited service state, the MME or SGSN shall proceed even if the Authentication Information Retrieval procedure has failed. In this case, the MME or SGSN shall mark the user's IMSI as unauthenticated.

Vectors with lower Item Number should be used before Vectors with higher Item Number are used in the MME or SGSN. For Vectors received within different requests those received by the earlier request should be used before those received by the later request.

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

5.2.3.1.3 Detailed behaviour of the HSS

When receiving an Authentication Information request the HSS shall check whether subscription data exists for the IMSI.

If the HSS determines that there is not any type of subscription for the IMSI (including EPS, GPRS and CS subscription data), a result code of DIAMETER_ERROR_USER_UNKNOWN shall be returned.

If the subscriber has neither EPS subscription data nor GPRS subscription data, the HSS shall return a result code of DIAMETER_ERROR_UNKNOWN_ EPS_SUBSCRIPTION.

When sending DIAMETER_ERROR_UNKNOWN_EPS_SUBSCRIPTION, an Error Diagnostic information may be added to indicate whether or not GPRS subscription data are subscribed (i.e. whether or not Network Access Mode stored in the HSS indicates that only circuit service is allowed).

The HSS shall then request the AuC to generate the corresponding requested Authentication Vectors (AVs). Subject to load considerations and/or other implementation specific considerations which may be based on the presence of an Immediate-Response-Preferred AVP, less AVs than the requested number of AVs may be generated.

If EUTRAN-Authentication-Info is requested, when receiving AVs from the AuC, the HSS shall generate the KASME before sending the response to the MME or combined MME-SGSN.

If the AuC is unable to calculate any corresponding AVs due to unallowed attachment for the UE, e.g. the UE is attaching via E-UTRAN with a SIM card equipped, the HSS shall return an error DIAMETER_AUTHORIZATION_REJECTED, the HSS shall not return any AV to the requesting node in the response. Otherwise, if no corresponding pre-computed AV is available, and the AuC is unable to calculate any corresponding AVs due to unknown failures, such as the internal database error, the result code shall be set to DIAMETER_AUTHENTICATION_DATA_UNAVAILABLE. The MME or the SGSN may request authentication vectors again.

For details see 3GPP TS 33.401 [5]. KASME generation is not performed before sending the response to the SGSN.

If the Requested-EUTRAN-Authentication-Info AVP is present in the request, the HSS shall download E-UTRAN authentication vectors to the MME. If the Requested-UTRAN-GERAN-Authentication-Info AVP is present in the request, the HSS shall download UTRAN or GERAN authentication vectors to the SGSN.

If the Immediate Response Preferred parameter has been received, the HSS may use it together with the number of requested vectors and the number of vectors stored in the HSS that are pre-computed to determine the number of vectors to be obtained from the AuC. The HSS may return less number of vectors than requested to the MME or SGSN. If both the Requested-EUTRAN-Authentication-Info AVP and the Requested-UTRAN-GERAN-Authentication-Info AVP are in the request, and one of them includes the Immediate Response Preferred parameter, the HSS may omit the vectors request that are not for immediate use. If both the Requested-EUTRAN-Authentication-Info AVP and the Requested-UTRAN-GERAN-Authentication-Info AVP are in the request, and both of them includes the Immediate Response Preferred parameter, the HSS may return E-UTRAN authentication vectors and UTRAN or GERAN authentication vectors. KASME is always computed for each E-UTRAN vector due to the PLMN-binding before sending the response to the MME independent of the presence of the Immediate Response Preferred parameter.

If the Re-Synchronization-Info AVP has been received, the HSS shall check the AUTS parameter before sending new authentication vectors to the MME or the SGSN. For details see 3GPP TS 33.102 [18]. If both the Requested-EUTRAN-Authentication-Info AVP and the Requested-UTRAN-GERAN-Authentication-Info AVP are in the request, and both of them include the Re-Synchronization-Info AVP, the HSS shall not check the AUTS parameter and return the result code of DIAMETER_UNABLE_TO_COMPLY. Any authentication vectors shall not be sent by the HSS to the requesting node in the response.

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

The HSS shall then return the result code DIAMETER_SUCCESS and the generated AVs (if any) to the MME or SGSN.

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.4 Fault Recovery Procedures

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.4.1 Reset

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.4.1.1 General

The Reset Procedure shall be used by the HSS, after a restart, to indicate to the MME and to the SGSN that a failure has occurred.

This procedure is mapped to the commands Reset-Request/Answer (RSR/RSA) in the Diameter application specified in chapter 7.

Table 5.2.4.1.1/1 specifies the involved information elements for the request.

Table 5.2.4.1.1/2 specifies the involved information elements for the answer.

Table 5.2.4.1.1/1: Reset Request

Information element name	Mapping to Diameter AVP	Cat.	Description
User Id List (See 7.3.50)	User-Id	O	This IE shall contain a list of User-Ids where a User-Id comprises the leading digits of an IMSI (i.e. MCC, MNC, leading digits of MSIN) and it shall identify the set of subscribers whose IMSIs begin with the User-Id. The HSS may include this information element if the occurred failure is limited to subscribers identified by one or more User-Ids.
Supported Features (See 3GPP TS 29.229 [9])	Supported-Features	O	If present, this information element shall contain the list of features supported by the origin host.

Table 5.2.4.1.1/2: Reset Answer

Information element name	Mapping to Diameter AVP	Cat.	Description
Supported Features (See 3GPP TS 29.229 [9])	Supported-Features	O	If present, this information element shall contain the list of features supported by the origin host.
Result (See 7.4)	Result-Code / Experimental-Result	M	This IE shall contain the result of the operation. The Result-Code AVP shall be used to indicate success / errors as defined in the Diameter Base Protocol. The Experimental-Result AVP shall be used for S6a/S6d errors. This is a grouped AVP which shall contain the 3GPP Vendor ID in the Vendor-Id AVP, and the error code in the Experimental-Result-Code AVP. There are no Experimental-Result codes applicable for this command.

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported. Unsupported parameters are not set when sending.

5.2.4.1.2 Detailed behaviour of the MME and the SGSN

When receiving a Reset message the MME or SGSN or combined MME/SGSN shall mark all impacted subscriber records " Location Information Confirmed in HSS " as "Not Confirmed". The MME or SGSN or combined MME/SGSN shall make use of the HSS Identity received in the Origin-Host AVP (by comparing it with the value stored after successful ULA) and may make use of the received User-Id-List (if any) in order to determine which subscriber records are impacted.

At the next authenticated radio contact with the UE concerned, if the subscriber record "Location Information Confirmed in HSS" is marked as "Not Confirmed", the restoration procedure shall be triggered.

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

5.2.4.1.3 Detailed behaviour of the HSS

The HSS shall make use of this procedure in order to indicate to all relevant MMEs, SGSN, and combined MME/SGSNs that the HSS has restarted and may have lost the current MME-Identity and SGSN-Identity of some of its subscribers who may be currently roaming in the MME area and/or SGSN area, and that the HSS, therefore, cannot send a Cancel Location messages or Insert Subscriber Data messages when needed.

The HSS optionally may include a list of Ids identifying a subset of subscribers served by the HSS, if the occurred failure is limited to those subscribers.

The HSS should invoke this procedure towards a combined MME/SGSN only for a single time even if some of the impacted subscribers are attached to the combined MME/SGSN via UTRAN/GERAN and some of the impacted subscribers are attached to the combined MME/SGSN via E-UTRAN.

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.5 Notification Procedures

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.5.1 Notification

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.5.1.1 General

The Notification Procedure shall be used between the MME and the HSS and between the SGSN and the HSS when an inter MME or SGSN location update does not occur but the HSS needs to be notified about

- an update of terminal information;
- an update of the UE SRVCC capability.

The Notification Procedure shall also be used between the MME and the HSS and between the SGSN and the HSS if the HSS needs to be notified about:

- an assignment/change of a dynamically allocated PDN GW for an APN, if such a notification is needed taking into account the access restrictions;

The Notification Procedure shall be used between the MME and the HSS when an inter MME location update does not occur but the HSS needs to be notified about

- the need to send a Cancel Location to the current SGSN.

The Notification Procedure shall be used between the MME and the HSS when the "SMS in MME" feature is applied and between the SGSN and the HSS when an earlier short message delivery failed and the HSS needs to be notified about:

- the UE is reachable or the UE has memory capacity available to receive one or more short messages.

The Notification Procedure shall be used between the MME and the HSS and between the SGSN and the HSS when the HSS has requested to be notified about:

- the UE is reachable.

The Notification Procedure shall be used between the MME and the HSS and between the SGSN and the HSS to notify the HSS about:

- an update of the Homogeneous Support of IMS Voice Over PS Sessions.

The Notification Procedure shall be used between the MME and the HSS to notify the HSS about:

- removal of MME registration for SMS.

This procedure is mapped to the commands Notify-Request/Answer (NOR/NOA) in the Diameter application specified in chapter 7.

Table 5.2.5.1.1/1 specifies the involved information elements for the request.

Table 5.2.5.1.1/2 specifies the involved information elements for the answer.

Table 5.2.5.1.1/1: Notify Request

Information element name	Mapping to Diameter AVP	Cat.	Description
IMSI	User-Name (See IETF RFC 3588 [4])	M	This information element shall contain the user IMSI, formatted according to 3GPP TS 23.003 [3], clause 2.2.
Supported Features (See 3GPP TS 29.229 [9])	Supported-Features	O	If present, this information element shall contain the list of features supported by the origin host.
Terminal Information (See 7.3.3)	Terminal-Information	C	This information element shall contain information about the user's mobile equipment. When notifying the HSS about any change of Terminal Information, the MME or SGSN shall include the new Terminal Information in the request. Within this Information Element, only the IMEI and the Software-Version AVPs shall be used on the S6a/S6d interface.
PDN GW Identity (See 7.3.45)	MIP6-Agent-Info	C	This IE shall contain the identity of the selected and dynamically allocated PDN GW for an APN. It shall be present if a new PDN-GW has been selected and the subscriber is allowed handover to non 3GPP access. When notifying the HSS about a newly selected PDN GW, the MME or SGSN shall include the PDN-GW-Identity in the request.
PGW PLMN ID	Visited-Network-Identifier	C	This IE identifies the PLMN in which the PDN GW is located. It shall be present when the PDN GW Identity is present and does not contain an FQDN.
Context Identifier (See 7.3.27)	Context-Identifier	O	This parameter shall identify the APN Configuration with which the selected PDN GW shall be correlated. It may be present if it is available and the PDN-GW is present and is particular for one specific APN and not common to all the APNs. For the compatibility with the MAP protocol as defined in the 3GPP TS 29.002 [24], this parameter shall not have a value of zero.
APN (See TS 23.008 [30])	Service-Selection (See IETF RFC 5778 [20])	C	This IE shall contain the APN for the selected and dynamically allocated PDN GW. It shall be present if the selected PDN-GW is present and is particular for one specific APN and not common to all the APNs.
Alert Reason (See 7.3.83)	Alert-Reason	C	This parameter shall indicate if the mobile subscriber is present or the MS has memory available. It shall be present when notifying the HSS about the presence of the UE or the UE has memory capacity available to receive one or more short messages.
UE SRVCC Capability	UE-SRVCC-Capability	C	This information element shall indicate if the UE supports or does not support the SRVCC capability. When notifying the HSS about a change of the UE SRVCC Capability, the MME or SGSN shall include the new UE SRVCC Capability in the request.
NOR Flags (See 7.3.49)	NOR-Flags	C	This Information Element shall contain a bit mask. See 7.3.49 for the meaning of the bits. Absence of this information element shall be interpreted as all bits set to 0. When notifying the HSS about the need to send cancel location to the current SGSN, the MME shall set the "Single-Registration-Indication" flag in the NOR-Flags. When notifying the HSS about the "restricted" status of the current SGSN area, the SGSN shall set the "SGSN area restricted" flag in the NOR-Flags. When notifying the HSS about the reachability of the UE or the UE has memory capacity available to receive one or more short messages, the MME, if the "SMS in MME" feature is applied, or SGSN shall set the "Ready for SM" flag correspondingly in the NOR-Flags. When notifying the HSS that the UE is reachable, the MME or SGSN shall set the "UE Reachable" flag correspondingly in the NOR-Flags. When notifying the HSS about update of the Homogeneous Support of IMS Voice Over PS Sessions, the MME or the SGSN shall set the "Homogeneous Support of IMS Voice Over PS Sessions" flag correspondingly in the NOR-Flags. When notifying the HSS about removal of MME registration for SMS, the MME shall set the "Removal of MME Registration for SMS" flag correspondingly in the NOR-Flags.

Table 5.2.5.1.1/2: Notify Answer

Information element name	Mapping to Diameter AVP	Cat.	Description
Result (See 7.4)	Result-Code / Experimental-Result	M	This IE shall contain the result of the operation. The Result-Code AVP shall be used to indicate success / errors as defined in the Diameter Base Protocol. The Experimental-Result AVP shall be used for S6a/S6d errors. This is a grouped AVP which shall contain the 3GPP Vendor ID in the Vendor-Id AVP, and the error code in the Experimental-Result-Code AVP. The following errors are applicable in this case: - User Unknown
Supported Features (See 3GPP TS 29.229 [9])	Supported-Features	O	If present, this information element shall contain the list of features supported by the origin host.

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported. Unsupported parameters are not set when sending.

5.2.5.1.2 Detailed behaviour of the MME and the SGSN

If the MME or SGSN supports Emergency services, the MME or SGSN shall not make use of the Notification procedure for emergency attached UEs.

The MME or SGSN shall include conditional AVPs in NOR according to the description given in table 5.2.5.1.1/1.

If the MME sends a Notify Request to inform the HSS that the UE has become reachable again, the MME shall clear the corresponding URRP-MME for the UE.

If the SGSN sends a Notify Request to inform the HSS that the UE has become reachable again, the SGSN shall clear the corresponding URRP-SGSN for the UE.

If the MME sends a Notify Request to inform the HSS about the presence of the UE to receive one or more short messages, the MME shall clear the corresponding MNRF for the UE.

If the SGSN sends a Notify Request to inform the HSS about the presence of the UE to receive one or more short messages, the SGSN shall clear the corresponding MNRG for the UE.

If the MME or the SGSN determines that it needs to update the Homogeneous Support of IMS Voice Over PS Sessions in the HSS, the MME or the SGSN shall send a Notify Request with the updated Homogeneous Support of IMS Voice Over PS Sessions to the HSS.

If the MME needs to indicate to the HSS that it is no longer registered for SMS in the HSS, the MME shall send a Notify Request with "Removal of MME Registration for SMS" flag set in the NOR-Flags AVP.

When receiving a Notify response from the HSS, if the result code indicates DIAMETER_ERROR_UNKNOWN_SERVING_NODE, the MME or SGSN shall consider the Notification procedure as failed, and it shall mark the subscriber record as "Subscriber to be restored in HSS".

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

・The description hatched with gray is unsupported.

5.2.5.1.3 Detailed behaviour of the HSS

When receiving a Notify request the HSS shall check whether the IMSI is known.

If it is not known, a result code of DIAMETER_ERROR_USER_UNKNOWN shall be returned.

If the IMSI is known, and the source MME or SGSN originating the Notify message is not currently registered in HSS for that UE, a result code of DIAMETER_ ERROR_ UNKNOWN_SERVING_NODE shall be returned.

If the IMSI is known, and the source MME or SGSN is currently registered in HSS, the HSS shall set the result code to DIAMETER_SUCCESS, unless otherwise stated, and

- store the new terminal information if present in the request;
- store the new UE SRVCC capability if present in the request;
- store the new PDN GW and PLMN ID for an APN if present in the request and the APN is present in the subscription and if PDN GW is dynamically allocated; otherwise the HSS shall not store the new PDN GW data and shall set the result code to DIAMETER_ERROR_UNABLE_TO_COMPLY;
- store the new PDN GW and PLMN ID, and the APN itself, if both are present in the request, and the APN is not present in the subscription but a wild card APN is present in the subscription;
- mark the location area as "restricted" if so indicated in the request;
- send Cancel Location to the current SGSN if so indicated in the request;
- if the UE has become reachable again, and NOR is received on S6a from an MME or on S6d from an SGSN, the HSS shall respectively clear the URRP-MME or the URPP-SGSN parameter for the UE and send an indication t of UE reachability from MME or SGSN o the Service Related Entities if there is any;
- when NOR is received on S6d from an SGSN (with the Alert Reason present), the HSS shall reset the MNRG flag and send a MAP-Alert-Service-Centre message, i.e. the behaviour in the HSS should be the same as when a MAP-Ready for SM is received from an SGSN;
- when NOR is received on S6a from an MME (with the Alert Reason present), the HSS shall reset the MNRF flag and send a MAP-Alert-Service-Centre message, i.e. the behaviour in the HSS should be the same as when a MAP-Ready for SM is received from a VLR/MSC;
- when NOR is received on S6a from an MME or on S6d from an SGSN to update the Homogeneous Support of IMS Voice Over PS Sessions, the HSS shall store the updated Homogeneous Support of IMS Voice Over PS Sessions and may use this information in the future in order to skip the T-ADS data retrieval, as described in clause 5.2.2.1 (IDR/IDA commands). If the "Homogeneous Support of IMS Voice Over PS Sessions" bit is set in the NOR-Flags AVP received but without Homogeneous-Support-of-IMS-Voice-Over-PS-Sessions AVP present in the NOR message, the HSS shall take the Homogeneous Support of IMS Voice Over PS Sessions as unknown to the serving node.
- when NOR is received on S6a from an MME for removal of MME registration for SMS, the HSS shall remove the MME registration for SMS and the "MME number for SMS" as the corresponding MSC number to be used for MT SMS.

and then send the response to the MME or SGSN.

[DOCOMO Compliance]

Compliance : Not Applicable

5A MME – CSS (S7a) and SGSN – CSS (S7d)

[DOCOMO Compliance]

Compliance : Not Applicable

5A.1 Introduction

The S7a interface enables the transfer of subscriber related CSG data in the VPLMN between the MME and the CSS as described in 3GPP TS 23.401 [2].

The S7d interface enables the transfer of subscriber related CSG data in the VPLMN between the SGSN and the CSS as described in 3GPP TS 23.060 [12].

[DOCOMO Compliance]

Compliance : Not Compliance

5A.2 Mobility Services

[DOCOMO Compliance]

Compliance : Not Applicable

5A.2.1 Location Management Procedures

[DOCOMO Compliance]

Compliance : Not Applicable

5A.2.1.1 Update VCSG Location

[DOCOMO Compliance]

Compliance : Not Applicable

5A.2.1.1.1 General

The Update VCSG Location Procedure shall be used between the MME and the CSS or between the SGSN and the CSS to update location information in the CSS or retrieve the CSG subscription data of the UE from the CSS. The procedure allows:

- to inform the CSS about the identity of the MME or SGSN currently serving the user,
- to update MME or SGSN with user CSG subscription data received from the CSS.

This procedure is mapped to the commands Update-VCSG-Location-Request/Answer (UVR/UVA) in the Diameter application specified in chapter 7.

Table 5A.2.1.1.1/1 specifies the involved information elements for the request.

Table 5A.2.1.1.1/2 specifies the involved information elements for the answer.

Table 5A.2.1.1.1/1: Update VCSG Location Request

Information element name	Mapping to Diameter AVP	Cat.	Description
IMSI	User-Name (See IETF RFC 3588 [4])	M	This information element shall contain the user IMSI, formatted according to 3GPP TS 23.003 [3], clause 2.2.
Supported Features (See 3GPP TS 29.229 [9])	Supported-Features	O	If present, this information element shall contain the list of features supported by the origin host.
MSISDN	MSISDN	C	This information element shall contain the user MSISDN, formatted according to 3GPP TS 29.329 [25]. It shall be present if available.
UVR Flags (See 7.3.X)	UVR-Flags	M	This Information Element contains a bit mask. See 7.3.X for the meaning of the bits.
SGSN number (See 7.3.102)	SGSN-Number	C	This Information Element contains the ISDN number of the SGSN, see 3GPP TS 23.003 [3]. It shall be present when the message is sent on the S7d interface. It may be present when the message on the S7a interface and the requesting node is a combined MME/SGSN.

Table 5A.2.1.1.1/2: Update VCSG Location Answer

Information element name	Mapping to Diameter AVP	Cat.	Description
Supported Features (See 3GPP TS 29.229 [9])	Supported-Features	O	If present, this information element shall contain the list of features supported by the origin host.
Result (See 7.4)	Result-Code / Experimental-Result	M	This IE shall contain the result of the operation. The Result-Code AVP shall be used to indicate success / errors as defined in the Diameter Base Protocol. The Experimental-Result AVP shall be used for S7a/S7d errors. This is a grouped AVP which shall contain the 3GPP Vendor ID in the Vendor-Id AVP, and the error code in the Experimental-Result-Code AVP. The following errors are applicable: - User Unknown
VPLMN CSG Subscription Data (See 7.3.Y)	VPLMN-CSG-Subscription-Data	C	This Information Element shall contain the list of CSG Ids and the associated expiry dates stored in the CSS. It shall be present if success is reported, unless an explicit "skip subscriber data" indication was present in the request or the Temporary Empty VPLMN CSG Subscription Data flag is set.
UVA Flags (See 7.3.X)	UVA-Flags	C	This Information Element contains a bit mask. See 7.3.X for the meaning of the bits.

[DOCOMO Compliance]

Compliance : Not Compliance

5A.2.1.1.2 Detailed behaviour of the MME and the SGSN

The MME or SGSN shall make use of this procedure to register the UE in the CSS and to retrieve the "CSG subscription data from CSS" when:

- the VPLMN supports Autonomous CSG Roaming

- and the HPLMN has enabled Autonomous CSG Roaming in the VPLMN
- and the UE has requested an initial attach or a tracking area procedure or a routing area procedure to a CSG cell
- and the MME or SGSN have not yet registered the UE in the CSS.

If the Autonomous CSG Roaming in the VPLMN is not supported or is not allowed by the HPLMN of the subscriber, the MME or SGSN shall not make use of the Update CSG Location procedure.

For UEs receiving emergency services, in which the UE was not successfully authenticated, the MME or SGSN shall not make use of the Update VCSG Location procedure.

A combined MME/SGSN shall set the "Skip Subscriber Data" flag in the UVR-Flags if the "CSG subscription data from CSS" are already available due to a previously VCSG Location updating.

A combined MME/SGSN that has chosen the option to include the SGSN Number within an Update VCSG Request sent over S7a shall be prepared to receive a single CSG subscription data update message from the CSS when the CSG subscription data is modified in the CSS.

When receiving an Update VCSG Location Answer from the CSS, the MME or SGSN shall check the result code. If it indicates success the MME or SGSN shall delete all the stored "CSG subscription data from CSS" (if any) and then store the received "CSG subscription data from the CSS" (if any), and it shall store the CSS identity as received in the Origin-Host AVP.

If the same CSG Id exists in both "CSG subscription data from CSS" and "CSG subscription data from HSS", the "CSG subscription data from HSS" shall take precedence over the "CSG subscription data from CSS" in further use.

If an error response is received from the CSS, the MME or SGSN shall not reject the UE and shall end the procedure when the UE is attaching to a normal cell. If the UE is attaching to a CSG cell, in this case the MME or SGSN shall check if there is such CSG Id from the HSS. If there is no such CSG Id, the MME or SGSN shall reject the UE.

[DOCOMO Compliance]

Compliance : Not Compliance

5A.2.1.1.3 Detailed behaviour of the CSS

When receiving an Update VCSG Location request the CSS shall check whether the user is known.

If the user is not known, and if the Update VCSG Location Request is received over the S7a/S7d interface, the CSS may:

- store the MME or SGSN identity received within the Origin-Host AVP, and include the UVA-Flags AVP with "Temporary Empty VPLMN CSG Subscription Data" flag set, and return a Result Code of DIAMETER_ SUCCESS, or
- return a Result Code of DIAMETER_ERROR_USER_UNKNOWN.

NOTE: A mechanism is needed in the CSS to associate the CSG subscription data of the user with the received IMSI.

If the Update VCSG Location Request is received over the S7a/S7d interface, the CSS shall replace the stored MME or SGSN identity with the received value (the identity is received within the Origin-Host AVP).

If no result code indicating an error is sent to the MME or SGSN, the CSS shall include the VPLMN CSG subscription data in the Update VCSG Location Answer unless an explicit "skip subscriber data" indication has been received in the request, and shall return a Result Code of DIAMETER_SUCCESS.

[DOCOMO Compliance]

Compliance : Not Applicable

5A.2.1.2 Cancel VCSG Location

[DOCOMO Compliance]

Compliance : Not Applicable

5A.2.1.2.1 General

The Cancel VCSG Location Procedure shall be used between the CSS and the MME and between the CSS and the SGSN. The procedure shall be invoked by the CSS and is used:

- to inform the MME or SGSN about the subscriber's VCSG subscription withdrawal by the CSS operator and the removal of their registration in the CSS.

This procedure is mapped to the commands Cancel-VCSG-Location-Request/Answer (CVR/CVA) in the Diameter application specified in chapter 7.

Table 5A.2.1.2.1/1 specifies the involved information elements for the request.

Table 5A.2.1.2.1/2 specifies the involved information elements for the answer.

Table 5A.2.1.2.1/1: Cancel VCSG Location Request

Information element name	Mapping to Diameter AVP	Cat.	Description
IMSI	User-Name (See IETF RFC 3588 [4])	M	This information element shall contain the user IMSI, formatted according to 3GPP TS 23.003 [3], clause 2.2.
Supported Features (See 3GPP TS 29.229 [9])	Supported-Features	O	If present, this information element shall contain the list of features supported by the origin host.
Cancellation Type (See 7.3.24)	Cancellation-Type	M	Defined values that can be used are: - Subscription Withdrawal, applied to the VPLMN CSG subscription.

Table 5A.2.1.2.1/2: Cancel VCSG Location Answer

Information element name	Mapping to Diameter AVP	Cat.	Description
Supported Features (See 3GPP TS 29.229 [9])	Supported-Features	O	If present, this information element shall contain the list of features supported by the origin host.
Result (See 7.4)	Result-Code / Experimental-Result	M	The result of the operation. The Result-Code AVP shall be used to indicate success / errors as defined in the Diameter Base Protocol.

[DOCOMO Compliance]

Compliance : Not Compliance

5A.2.1.2.2 Detailed behaviour of the MME and the SGSN

When receiving a Cancel VCSG Location request the MME or SGSN shall check whether the IMSI is known.

If it is not known, a result code of DIAMETER_SUCCESS is returned.

If it is known, the MME or SGSN shall check if the Cancellation Type is Subscription Withdrawal. In this case, the MME or SGSN shall remove the information of their registration in the CSS and the stored VPLMN CSG subscription if any. Also in this case a result code of DIAMETER_SUCCESS is returned.

When a UE is served by a single combined MME/SGSN for both E-UTRAN and non-E-UTRAN access, the combined MME/SGSN shall check if the Cancellation Type is Subscription Withdrawal. In this case, the Cancel VCSG Location request is processed both in the MME part and in the SGSN part of the combined node.

[DOCOMO Compliance]

Compliance : Not Compliance

5A.2.1.2.3 Detailed behaviour of the CSS

The CSS shall make use of this procedure when the user's VPLMN CSG subscription is withdrawn by the CSS operator and shall include a cancellation type of "Subscription Withdrawal.

[DOCOMO Compliance]

Compliance : Not Applicable

5A.2.2 Subscriber Data Handling Procedures

[DOCOMO Compliance]

Compliance : Not Applicable

5A.2.2.1 Insert VCSG Subscriber Data

[DOCOMO Compliance]

Compliance : Not Applicable

5A.2.2.1.1 General

The Insert VCSG Subscriber Data Procedure shall be used between the CSS and the MME and between the CSS and the SGSN for updating CSG subscription data in the MME or SGSN in the following situations:

- due to administrative changes of the user data in the CSS and the user is now located in an MME or SGSN, i.e. if the user was given a CSG subscription and the CSG subscription has changed;

If the CSS knows that the UE has attached to the same combined MME/SGSN via both the E-UTRAN and UTRAN/GERAN, i.e. the CSS has received the Update VCSG Location Request over both the S7a interface and S7d interface respectively with the same SGSN number, the CSS should invoke this procedure for a single time to update CSG subscription data in the combined MME/SGSN, i.e. the CSS should not invoke this procedure for each of the MME and the SGSN registered respectively.

This procedure is mapped to the commands Insert-Subscriber Data-Request/Answer (IDR/IDA) in the Diameter application specified in clause 7.

Table 5A.2.2.1.1/1 specifies the involved information elements for the request.

Table 5A.2.2.1.1/2 specifies the involved information elements for the answer.

Table 5A.2.2.1.1/1: Insert VCSG Subscriber Data Request

Information element name	Mapping to Diameter AVP	Cat.	Description
IMSI	User-Name (See IETF RFC 3588 [4])	M	This information element shall contain the user IMSI, formatted according to 3GPP TS 23.003 [3], clause 2.2.
Supported Features (See 3GPP TS 29.229 [9])	Supported-Features	O	If present, this information element shall contain the list of features supported by the origin host.
VPLMN CSG Subscription Data (See 7.3.2)	VPLMN-CSG-Subscription-Data	M	This Information Element shall contain the list of CSG Ids and the associated expiry dates stored in the VPLMN CSS.

Table 5A.2.2.1.1/2: Insert VCSG Subscriber Data Answer

Information element name	Mapping to Diameter AVP	Cat.	Description
Supported Features (See 3GPP TS 29.229 [9])	Supported-Features	O	If present, this information element shall contain the list of features supported by the origin host.
Result (See 7.4)	Result-Code / Experimental-Result	M	This IE shall contain the result of the operation. Result-Code AVP shall be used to indicate success / errors defined in the Diameter Base Protocol. The Experimental-Result AVP shall be used for S7a/S7d errors. This is a grouped AVP which shall contain the 3GPP Vendor Id in the Vendor-Id AVP, and the error code in the Experimental-Result-Code AVP. The following errors are applicable in this case: - User Unknown.

[DOCOMO Compliance]

Compliance : Not Compliance

5A.2.2.1.2 Detailed behaviour of the MME and the SGSN

When receiving an Insert VCSG Subscriber Data request, the MME or SGSN shall check whether the IMSI is known.

If it is not known, a result code of DIAMETER_ERROR_USER_UNKNOWN shall be returned.

If the request does not contain any CSG-Subscription-Data AVP, Experimental-Result shall be set to DIAMETER_ERROR_SUBS_DATA_ABSENT.

If the request contains at least one CSG-Subscription-Data AVPs, the MME or SGSN shall delete all the stored "CSG subscription data from CSS" (if any), and then store the received "CSG subscription data from CSS".

If the MME or SGSN cannot fulfil the received request, e.g. due to a database error, it shall set the Result-Code to DIAMETER_UNABLE_TO_COMPLY.

If the same CSG Id exists in both "CSG subscription data from CSS" and "CSG subscription data from HSS", the "CSG subscription data from HSS" shall take precedence over the "CSG subscription data from CSS" in further use.

[DOCOMO Compliance]

Compliance : Not Compliance

5A.2.2.1.3 Detailed behaviour of CSS

The CSS shall make use of this procedure to delete the "CSG subscription data from CSS" stored in the MME or SGSN and replace them with the CSG subscription data sent.

If the CSS receives a Insert VCSG Subscriber Data answer with the Result Code DIAMETER_ERROR_USER_UNKNOWN, the CSS shall clear the stored MME or SGSN identity.

[DOCOMO Compliance]

Compliance : Not Applicable

5A.2.2.2 Delete VCSG Subscriber Data

[DOCOMO Compliance]

Compliance : Not Applicable

5A.2.2.2.1 General

This procedure shall be used between the CSS and the MME or between the CSS and the SGSN, to remove all the "CSG subscription data from CSS" stored in the MME or SGSN. The procedure shall be invoked by the CSS.

If the CSS knows that the UE has attached to the same combined MME/SGSN via both E-UTRAN and UTRAN/GERAN, i.e. the CSS has received the Update VCSG Location Request over both the S7a interface and S7d interface respectively with the same SGSN number, the CSS should invoke this procedure for a single time to remove all the "CSG subscription data from CSS" stored in the combined MME/SGSN, i.e. not invoke this procedure for each of the MME and the SGSN registered respectively.

This procedure is mapped to the commands Delete-Subscriber-Data-Request/Answer (DSR/DSA) in the S7a/S7d Diameter application specified in clause 7.

Table 5A.2.2.2.1/1 specifies the involved information elements for the request.

Table 5A.2.2.2.1/2 specifies the involved information elements for the answer.

Table 5A.2.2.2.1/1: Delete VCSG Subscriber Data Request

Information element name	Mapping to Diameter AVP	Cat.	Description
IMSI	User-Name (See IETF RFC 3588 [4])	M	This information element shall contain the user IMSI, formatted according to 3GPP TS 23.003 [3], clause 2.2.
Supported Features (See 3GPP TS 29.229 [9])	Supported-Features	O	If present, this information element shall contain the list of features supported by the origin host.
DSR Flags (See 7.3.25)	DSR-Flags	M	This Information Element shall contain a bit mask. See 7.3.25 for the meaning of the bits.

Table 5A.2.2.2.1/2: Delete VCSG Subscriber Data Answer

Information element name	Mapping to Diameter AVP	Cat.	Description
Supported Features (See 3GPP TS 29.229 [9])	Supported-Features	O	If present, this information element shall contain the list of features supported by the origin host.
Result (See 7.4)	Result-Code / Experimental-Result	M	This IE shall contain the result of the operation. The Result-Code AVP shall be used to indicate success / errors as defined in the Diameter Base Protocol. The Experimental-Result AVP shall be used for S7a/S7d errors. This is a grouped AVP which shall contain the 3GPP Vendor ID in the Vendor-Id AVP, and the error code in the Experimental-Result-Code AVP. The following errors are applicable in this case: - User Unknown

[DOCOMO Compliance]

Compliance : Not Compliance

5A.2.2.2.2 Detailed behaviour of the MME and the SGSN

When receiving a Delete VCSG Subscriber Data request, the MME or SGSN shall check whether the IMSI is known.

If it is not known, a result code of DIAMETER_ERROR_USER_UNKNOWN shall be returned.

If it is known, the MME or SGSN shall delete all the stored "CSG subscription data from CSS".

If the deletion of the subscription data succeeds in the MME or SGSN, the Result-Code shall be set to DIAMETER_SUCCESS.

If the MME or SGSN cannot fulfil the received request for other reasons, e.g. due to a database error, it shall set the Result-Code to DIAMETER_UNABLE_TO_COMPLY.

[DOCOMO Compliance]

Compliance : Not Compliance

5A.2.2.2.3 Detailed behaviour of the CSS

The CSS shall make use of this procedure to remove all the CSG subscription data associated to CSS from the MME or SGSN.

NOTE: When a Delete VCSG Subscriber Data procedure occurs, the MME or SGSN remains registered in the CSS

If the CSS receives a Delete VCSG Subscriber Data answer with the Result Code DIAMETER_ERROR_USER_UNKNOWN from the MME or SGSN, the CSS shall clear the stored MME or SGSN identity.

[DOCOMO Compliance]

Compliance : Not Applicable

5A.2.3 Fault Recovery Procedures

[DOCOMO Compliance]

Compliance : Not Applicable

5A.2.3.1 VCSG Reset

[DOCOMO Compliance]

Compliance : Not Applicable

5A.2.3.1.1 General

The VCSG Reset Procedure shall be used by the CSS, after a restart, to indicate to the MME and to the SGSN that a failure has occurred.

This procedure is mapped to the commands Reset-Request/Answer (RSR/RSA) in the S7a/S7d Diameter application specified in chapter 7.

Table 5A.2.3.1.1/1 specifies the involved information elements for the request.

Table 5A.2.3.1.1/2 specifies the involved information elements for the answer.

Table 5A.2.3.1.1/1: VCSG Reset Request

Information element name	Mapping to Diameter AVP	Cat.	Description
Supported Features (See 3GPP TS 29.229 [9])	Supported-Features	O	If present, this information element shall contain the list of features supported by the origin host.

Table 5A.2.3.1.1/2: VCSG Reset Answer

Information element name	Mapping to Diameter AVP	Cat.	Description
Result (See 7.4)	Result-Code / Experimental-Result	M	This IE shall contain the result of the operation. The Result-Code AVP shall be used to indicate success / errors as defined in the Diameter Base Protocol. The Experimental-Result AVP shall be used for S7a/S7d errors. This is a grouped AVP which shall contain the 3GPP Vendor ID in the Vendor-Id AVP, and the error code in the Experimental-Result-Code AVP. There are no Experimental-Result codes applicable for this command.
Supported Features (See 3GPP TS 29.229 [9])	Supported-Features	O	If present, this information element shall contain the list of features supported by the origin host.

[DOCOMO Compliance]

Compliance : Not Compliance

5A.2.3.1.2 Detailed behaviour of the MME and the SGSN

When receiving a VCSG Reset message, the MME or SGSN or combined MME/SGSN, for all roaming users for which they have a registration in CSS, shall mark "Location Information Confirmed in CSS" record as "Not Confirmed". The MME or SGSN or combined MME/SGSN shall make use of the CSS Identity received in the Origin-Host AVP (by comparing it with the value stored after successful ULA) in order to determine which user records are impacted.

When, as described in 3GPP TS 23.007 [43], an event requiring the MME or SGSN to check the "CSG subscription data from CSS" occurs, and if the user record "Location Information Confirmed in CSS" is marked as "Not Confirmed", the restoration procedure shall be triggered.

[DOCOMO Compliance]

Compliance : Not Compliance

5A.2.3.1.3 Detailed behaviour of the CSS

The CSS shall make use of this procedure in order to indicate to all relevant MMEs, SGSNs, and combined MME/SGSNs that the CSS has restarted and may have lost the current MME-Identity and SGSN-Identity of some of its users who may be currently roaming in the MME area and/or SGSN area, and to which the CSS, therefore, cannot send e.g. Insert VCSG Subscriber Data messages when needed.

The CSS should invoke this procedure towards a combined MME/SGSN only for a single time even if some of the impacted subscribers are attached to the combined MME/SGSN via UTRAN/GERAN and some of the impacted subscribers are attached to the combined MME/SGSN via E-UTRAN.

[DOCOMO Compliance]

Compliance : Not Applicable

6 MME – EIR (S13) and SGSN – EIR (S13')

[DOCOMO Compliance]

Compliance : Not Applicable

6.1 Introduction

The S13 interface shall enable the ME Identity check procedure between the MME and the EIR as described in the 3GPP TS 23.401 [2].

The S13' interface shall enable the ME Identity check procedure between the SGSN and the EIR as described in the 3GPP TS 23.060 [12].

[DOCOMO Compliance]

Compliance : Not Compliance

6.2 ME Identity Check Procedures

[DOCOMO Compliance]

Compliance : Not Applicable

6.2.1 ME Identity Check

[DOCOMO Compliance]

Compliance : Not Applicable

6.2.1.1 General

This Mobile Equipment Identity Check Procedure shall be used between the MME and the EIR and between the SGSN and the EIR to check the Mobile Equipment's identity status (e.g. to check that it has not been stolen, or, to verify that it does not have faults).

This procedure is mapped to the commands ME-Identity-Check-Request/Answer (ECR/ECA) in the Diameter application specified in chapter 6.

Table 6.2.1.1/1 specifies the involved information elements for the request.

Table 6.2.1.1/2 specifies the involved information elements for the answer.

Table 6.2.1.1/1: ME Identity Check Request

Information element name	Mapping to Diameter AVP	Cat.	Description
Terminal Information (See 7.3.3)	Terminal-Information	M	This information element shall contain the information about the used mobile equipment i.e. the IMEI.
IMSI	User-Name (See IETF RFC 3588 [4])	O	This information element shall contain the user IMSI, formatted according to 3GPP TS 23.003 [3], clause 2.2.

Table 6.2.1.1/2: ME Identity Check Answer

Information element name	Mapping to Diameter AVP	Cat.	Description
Result (See 7.4)	Result-Code / Experimental-Result	M	This IE shall contain the result of the operation. The Result-Code AVP shall be used to indicate success / errors as defined in the Diameter Base Protocol. The Experimental-Result AVP shall be used for S13/S13' errors. This is a grouped AVP which shall contain the 3GPP Vendor ID in the Vendor-Id AVP, and the error code in the Experimental-Result-Code AVP. The following errors are applicable in this case: - Unknown equipment
Equipment Status (See 7.3.51)	Equipment-Status	C	This information element shall contain the status of the requested mobile equipment as defined in 3GPP TS 22.016 [13]. It shall be present if the result of the ME Identity Check is DIAMETER_SUCCESS.

[DOCOMO Compliance]

Compliance : Not Compliance

6.2.1.2 Detailed behaviour of the MME and the SGSN

The MME or the SGSN shall make use of this procedure to check the ME identity, if the MME or the SGSN is configured to check the IMEI with the EIR.

IMSI may be sent together with Terminal Information to the EIR for operator-determined purposes.

When receiving the ME Identity Check answer from the EIR, the MME or the SGSN shall check the result code and the equipment status. Dependent upon the result, the MME or the SGSN will decide its subsequent actions (e.g. sending an Attach Reject if the EIR indicates that the Mobile Equipment is unknown or blacklisted).

[DOCOMO Compliance]

Compliance : Not Compliance

6.2.1.3 Detailed behaviour of the EIR

When receiving an ME Identity Check request, the EIR shall check whether the mobile equipment is known. The EIR shall identify the mobile equipment based on the first 14 digits of the IMEI AVP.

If it is not known, a result code of DIAMETER_ERROR_ EQUIPMENT_UNKNOWN is returned.

If it is known, the EIR shall return DIAMETER_SUCCESS with the equipment status.

[DOCOMO Compliance]

Compliance : Not Applicable

7 Protocol Specification and Implementation

[DOCOMO Compliance]

Compliance : Not Applicable

7.1 Introduction

[DOCOMO Compliance]

Compliance : Not Applicable

7.1.1 Use of Diameter base protocol

The Diameter Base Protocol as specified in IETF RFC 3588 [4] shall apply except as modified by the defined support of the methods and the defined support of the commands and AVPs, result and error codes as specified in this specification. Unless otherwise specified, the procedures (including error handling and unrecognised information handling) shall be used unmodified.

[DOCOMO Compliance]

Compliance : Full Compliance

7.1.2 Securing Diameter Messages

For secure transport of Diameter messages, see 3GPP TS 33.210 [16]

[DOCOMO Compliance]

Compliance : Not Applicable

7.1.3 Accounting functionality

Accounting functionality (Accounting Session State Machine, related command codes and AVPs) shall not be used on the S6a, S6d, S13 and S13' interfaces.

[DOCOMO Compliance]

Compliance : Not Applicable

7.1.4 Use of sessions

Between the MME and the HSS and between the SGSN and the HSS and between the MME and the EIR, Diameter sessions shall be implicitly terminated. An implicitly terminated session is one for which the server does not maintain state information. The client shall not send any re-authorization or session termination requests to the server.

The Diameter base protocol includes the Auth-Session-State AVP as the mechanism for the implementation of implicitly terminated sessions.

The client (server) shall include in its requests (responses) the Auth-Session-State AVP set to the value NO_STATE_MAINTAINED (1), as described in IETF RFC 3588 [4]. As a consequence, the server shall not maintain any state information about this session and the client shall not send any session termination request. Neither the Authorization-Lifetime AVP nor the Session-Timeout AVP shall be present in requests or responses.

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

7.1.5 Transport protocol

Diameter messages over the S6a, S6d, S13 and S13' interfaces shall make use of SCTP IETF RFC 4960 [14] .

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.
- SCTP is based on IETF RFC 2960 and RFC 3309.

7.1.6 Routing considerations

This clause specifies the use of the Diameter routing AVPs Destination-Realm and Destination-Host.

If an MME or SGSN knows the address/name of the HSS for a certain user, and the associated home network domain name, both the Destination-Realm and Destination-Host AVPs shall be present in the request.

If an MME or SGSN knows only the home network domain name for a certain user, the Destination-Realm AVP shall be present and the command shall be routed to the next Diameter node.

If an MME or SGSN knows only the identity of the user, the home network domain name shall be derived from the user's IMSI (MNC and MCC values) to construct the EPC Home Network Realm/Domain, as indicated in 3GPP TS 23.003 [3], clause 19.2, and use it as Destination-Realm.

Consequently, the Destination-Host AVP is declared as optional in the ABNF for all requests initiated by an MME or SGSN.

The address/name of the EIR shall be locally configured in the MME.

Requests initiated by the HSS towards an MME or SGSN shall include both Destination-Host and Destination-Realm AVPs.

The HSS obtains the Destination-Host AVP to use in requests towards an MME or SGSN, from the Origin-Host AVP received in previous requests from the MME or SGSN. Consequently, the Destination-Host AVP is declared as mandatory in the ABNF for all requests initiated by the HSS.

The HSS obtains the Destination-Realm AVP to use in requests towards an MME or SGSN, from the Origin-Realm AVP received in previous requests from the MME or SGSN.

Destination-Realm AVP is declared as mandatory in the ABNF for all requests.

If the Vendor-Specific-Application-ID AVP is received in any of the commands, it may be ignored by the receiving node, and it shall not be used for routing purposes.

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

7.1.7 Advertising Application Support

The HSS, MME, SGSN and EIR shall advertise support of the Diameter S6a/S6d and/or S13/S13' Application by including the value of the application identifier in the Auth-Application-Id AVP within the Vendor-Specific-Application-Id grouped AVP of the Capabilities-Exchange-Request and Capabilities-Exchange-Answer commands.

The vendor identifier value of 3GPP (10415) shall be included in the Supported-Vendor-Id AVP of the Capabilities-Exchange-Request and Capabilities-Exchange-Answer commands, and in the Vendor-Id AVP within the Vendor-Specific-Application-Id grouped AVP of the Capabilities-Exchange-Request and Capabilities-Exchange-Answer commands.

The Vendor-Id AVP included in Capabilities-Exchange-Request and Capabilities-Exchange-Answer commands that is not included in the Vendor-Specific-Application-Id AVPs as described above shall indicate the manufacturer of the Diameter node as per RFC 3588 [4].

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

7.1.8 Diameter Application Identifier

This clause specifies three Diameter applications: The S6a/S6d interface application, the S13/S13' interface application, and the S7a/S7d interface application.

The S6a/S6d interface application allows a Diameter server and a Diameter client:

- to exchange location information;
- to authorize a user to access the EPS;
- to exchange authentication information;
- to download and handle changes in the subscriber data stored in the server.

The S6a/S6d interface protocol shall be defined as an IETF vendor specific Diameter application, where the vendor is 3GPP. The vendor identifier assigned by IANA to 3GPP (http://www.iana.org/assignments/enterprise-numbers) is 10415.

The Diameter application identifier assigned to the S6a/S6d interface application is 16777251 (allocated by IANA).

The S13/S13' interface application allows a Diameter server and a Diameter client:

- to check the validity of the ME Identity.

The S13/S13' interface protocol shall be defined as an IETF vendor specific Diameter application, where the vendor is 3GPP. The vendor identifier assigned by IANA to 3GPP (http://www.iana.org/assignments/enterprise-numbers) is 10415.

The Diameter application identifier assigned to the S13/S13' interface application is 16777252 (allocated by IANA).

The S7a/S7d interface application allows a Diameter server and a Diameter client:

- to authorize a user to access CSGs identified in the CSS while roaming;
- to download and handle changes in CSG subscriber data stored in the CSS.

The S7a/S7d interface protocol shall be defined as an IETF vendor specific Diameter application, where the vendor is 3GPP. The vendor identifier assigned by IANA to 3GPP (http://www.iana.org/assignments/enterprise-numbers) is 10415.

The Diameter application identifier assigned to the S7a/S7d interface application is 16777308 (allocated by IANA).

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

7.1.9 Use of the Supported-Features AVP

When new functionality is introduced on the S6a/S6d interfaces, it should be defined as optional. If backwards incompatible changes can not be avoided, the new functionality shall be introduced as a new feature and support advertised with the Supported-Features AVP. The usage of the Supported-Features AVP on the S6a/S6d interfaces is consistent with the procedures for the dynamic discovery of supported features as defined in clause 7.2 of 3GPP TS 29.229 [9].

When extending the application by adding new AVPs for a feature, the new AVPs shall have the M bit cleared and the AVP shall not be defined mandatory in the command ABNF.

As defined in 3GPP TS 29.229 [9], the Supported-Features AVP is of type grouped and contains the Vendor-Id, Feature-List-ID and Feature-List AVPs. On the all reference points as specified in this specificaion, the Supported-Features AVP is used to identify features that have been defined by 3GPP and hence, for features defined in this document, the Vendor-Id AVP shall contain the vendor ID of 3GPP (10415). If there are multiple feature lists defined for the reference point, the Feature-List-ID AVP shall differentiate those lists from one another.

The Table 7.3.10/1 defines the features applicable to the S6a/S6d interfaces for the feature list with a Feature-List-ID of 1. The Table 7.3.10/2 defines the features applicable to the S6a/S6d interfaces for the feature list with a Feature-List-ID of 2.

[DOCOMO Compliance]

Compliance : Not Applicable

7.2 Commands

[DOCOMO Compliance]

Compliance : Not Applicable

Comment :

- See RFC3588 SoC as to CER/CEA, DPR/DPA and DWR/DWA.
- *[AVP] is hatched with light blue because of customization AVP.

7.2.1 Introduction

This section defines the Command code values and related ABNF for each command described in this specification.

[DOCOMO Compliance]

Compliance : Not Applicable

7.2.2 Command-Code values

This section defines Command-Code values for the S6a/S6d interface application and S13/S13' interface application as allocated by IANA in the IETF RFC 5516 [32].

Every command is defined by means of the ABNF syntax IETF RFC 2234 [7], according to the rules in IETF RFC 3588 [4]. In the case, the definition and use of an AVP is not specified in this document, the guidelines in IETF RFC 3588 [4] shall apply.

NOTE: For this release, the Vendor-Specific-Application-ID is included as an optional AVP in all commands in order to ensure interoperability with diameter agents following a strict implementation of IETF RFC 3588, by which messages not including this AVP will be rejected. IETF RFC 3588 indicates that the AVP shall be present in all proxiable commands, such as those specified here, despite that the contents of this AVP are redundant since the Application ID is already present in the command header. This AVP may be removed in subsequent revisions of this specification, once the diameter base protocol is updated accordingly.

The following Command Codes are defined in this specification:

Table 7.2.2/1: Command-Code values for S6a/S6d

Command-Name	Abbreviation	Code	Section
Update-Location-Request	ULR	316	7.2.3
Update-Location-Answer	ULA	316	7.2.4
Cancel-Location-Request	CLR	317	7.2.7
Cancel-Location-Answer	CLA	317	7.2.8
Authentication-Information-Request	AIR	318	7.2.5
Authentication-Information-Answer	AIA	318	7.2.6
Insert-Subscriber-Data-Request	IDR	319	7.2.9
Insert-Subscriber-Data-Answer	IDA	319	7.2.10
Delete-Subscriber-Data-Request	DSR	320	7.2.11
Delete-Subscriber-Data-Answer	DSA	320	7.2.12
Purge-UE-Request	PUR	321	7.2.13
Purge-UE-Answer	PUA	321	7.2.14
Reset-Request	RSR	322	7.2.15
Reset-Answer	RSA	322	7.2.16
Notify-Request	NOR	323	7.2.17
Notify-Answer	NOA	323	7.2.18

For these commands, the Application-ID field shall be set to 16777251 (application identifier of the S6a/S6d interface application, allocated by IANA).

Table 7.2.2/2: Command-Code values for S13/S13'

Command-Name	Abbreviation	Code	Section
ME-Identity-Check-Request	ECR	324	7.2.19
ME-Identity-Check-Answer	ECA	324	7.2.20

For these commands, the Application-ID field shall be set to 16777252 (application identifier of the S13/S13' interface application, allocated by IANA).

Table 7.2.2/3: Command-Code values for S7a/S7d

Command-Name	Abbreviation	Code	Section
Update-VCSG-Location-Request	UVR	8388638	7.2.21
Update-VCSG-Location-Answer	UVA	8388638	7.2.22
Insert-Subscription-Data-Request	IDR	319	7.2.9
Insert-Subscription-Data-Answer	IDA	319	7.2.10
Delete-Subscriber-Data-Request	DSR	320	7.2.11
Delete-Subscriber-Data-Answer	DSA	320	7.2.12
Reset-Request	RSR	322	7.2.15
Reset-Answer	RSA	322	7.2.16
Cancel-VCSG-Location-Request	CVR	8388642	7.2.23
Cancel-VCSG-Location-Answer	CVA	8388642	7.2.24

For these commands, the Application-ID field shall be set to 167777308 (application identifier of the S7a/S7d interface application, allocated by IANA).

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

7.2.3 Update-Location-Request (ULR) Command

The Update-Location-Request (ULR) command, indicated by the Command-Code field set to 316 and the "R" bit set in the Command Flags field, is sent from MME or SGSN to HSS.

Message Format

```
< Update-Location-Request> ::=      < Diameter Header: 316, REQ, PXY, 16777251 >
                                    < Session-Id >
                                    [ Vendor-Specific-Application-Id ]
                                    { Auth-Session-State }
                                    { Origin-Host }
                                    { Origin-Realm }
                                    [ Destination-Host ]
                                    { Destination-Realm }
                                    { User-Name }
                                    *[ Supported-Features ]
                                    [ Terminal-Information ]
                                    { RAT-Type }
                                    { ULR-Flags }
                                    [UE-SRVCC-Capability   ]
                                    { Visited-PLMN-Id }
                                    [ SGSN-Number ]
                                    [ Homogeneous-Support-of-IMS-Voice-Over-PS-Sessions ]
                                    [ GMLC-Address ]
                                    *[ Active-APN ]
                                    [ Equivalent-PLMN-List ]
```

[MME-Number-for-MT-SMS]
[SMS-Register-Request]
*[AVP]
*[Proxy-Info]
*[Route-Record]

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- As to the blue hatching, the number of “Supported-Features” to be set is applicable up to “2”.
- The description hatched with gray is unsupported. Unsupported parameters are not set when sending.

7.2.4 Update-Location-Answer (ULA) Command

The Update-Location-Answer (ULA) command, indicated by the Command-Code field set to 316 and the 'R' bit cleared in the Command Flags field, is sent from HSS to MME or SGSN.

Message Format

< Update-Location-Answer> ::= < Diameter Header: 316, PXY, 16777251 >
< Session-Id >
[Vendor-Specific-Application-Id]
[Result-Code]
[Experimental-Result]
[Error-Diagnostic]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
*[Supported-Features]
[ULA-Flags]
[Subscription-Data]
*[AVP]
*[Failed-AVP]
*[Proxy-Info]
*[Route-Record]
*[Redirect-Host]
[Redirect-Host-Usage]
[Redirect-Max- Cache-Time]

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- As to the blue hatching, the number of “Supported-Features” to be set is “1” when sending and is any value within the acceptable range when receiving.
- The maximum value of “Redirect-Host” is “8”.
- The MME doesn’t check the contents of “Redirect-Host Usage” and "Redirect-Max-Chache-Time".
- The description hatched with gray is unsupported. Unsupported parameters are discarded when receiving.
- “Subscription-Data” must be set.

7.2.5 Authentication-Information-Request (AIR) Command

The Authentication-Information-Request (AIR) command, indicated by the Command-Code field set to 318 and the 'R' bit set in the Command Flags field, is sent from MME or SGSN to HSS.

Message Format

< Authentication-Information-Request> ::= < Diameter Header: 318, REQ, PXY, 16777251 >
< Session-Id >
[Vendor-Specific-Application-Id]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
[Destination-Host]
{ Destination-Realm }
{ User-Name }
*[Supported-Features]
[Requested-EUTRAN-Authentication-Info]
[Requested-UTRAN-GERAN-Authentication-Info]
{ Visited-PLMN-Id }
*[AVP]
*[Proxy-Info]
*[Route-Record]

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

7.2.6 Authentication-Information-Answer (AIA) Command

The Authentication-Information-Answer (AIA) command, indicated by the Command-Code field set to318 and the 'R' bit cleared in the Command Flags field, is sent from HSS to MME or SGSN.

Message Format

< Authentication-Information-Answer> ::= < Diameter Header: 318, PXY, 16777251 >
< Session-Id >
[Vendor-Specific-Application-Id]
[Result-Code]
[Experimental-Result]
[Error-Diagnostic]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
* [Supported-Features]
[Authentication-Info]
*[AVP]
*[Failed-AVP]
*[Proxy-Info]
*[Route-Record]
*[Redirect-Host]
[Redirect-Host-Usage]
[Redirect-Max-Cache-Time]

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- As to the blue hatching, the number of “Supported-Features” to be set is “1”.
- The description hatched with gray is unsupported.

7.2.7 Cancel-Location-Request (CLR) Command

The Cancel-Location-Request (CLR) command, indicated by the Command-Code field set to 317 and the 'R' bit set in the Command Flags field, is sent from HSS to MME or SGSN.

Message Format

```
< Cancel-Location-Request> ::=      < Diameter Header: 317, REQ, PXY, 16777251 >
                                    < Session-Id >
                                    [ Vendor-Specific-Application-Id ]
                                    { Auth-Session-State }
                                    { Origin-Host }
                                    { Origin-Realm }
                                    { Destination-Host }
                                    { Destination-Realm }
                                    { User-Name }
                                    *[Supported-Features ]
                                    { Cancellation-Type }
                                    [ CLR-Flags ]
                                    *[ AVP ]
                                    *[ Proxy-Info ]
                                    *[ Route-Record ]
```

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- As to the blue hatching, the number of “Supported-Features” to be set is “1”.
- The number of “Proxy-Info” to be set is applicable up to “8”. AVPs are to be discarded if they exceed the maximum value of 8.
- The MME doesn’t check the contents of “Proxy-Info” and “Route-Record”.
- The description hatched with gray is unsupported.

7.2.8 Cancel-Location-Answer (CLA) Command

The Cancel-Location-Answer (CLA) command, indicated by the Command-Code field set to 317 and the 'R' bit cleared in the Command Flags field, is sent from MME or SGSN to HSS.

Message Format

```
< Cancel-Location-Answer> ::=       < Diameter Header: 317, PXY, 16777251 >
                                    < Session-Id >
                                    [ Vendor-Specific-Application-Id ]
                                    *[ Supported-Features ]
                                    [ Result-Code ]
                                    [ Experimental-Result ]
                                    { Auth-Session-State }
                                    { Origin-Host }
                                    { Origin-Realm }
                                    *[ AVP ]
```

*[Failed-AVP]
*[Proxy-Info]
*[Route-Record]

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The MME sets “Proxy-Info” in CLA when receiving it in CLR.
- The description hatched with gray is unsupported.
- As to the blue hatching, the number of “Failed-AVP” to be set is “1” about the answer signals that the MME sends.

7.2.9 Insert-Subscriber-Data-Request (IDR) Command

The Insert-Subscriber-Data-Request (IDR) command, indicated by the Command-Code field set to 319 and the 'R' bit set in the Command Flags field, is sent from HSS or CSS to MME or SGSN.

Message Format when used over the S6a or S6d application:

< Insert-Subscriber-Data-Request> ::= < Diameter Header: 319, REQ, PXY, 16777251 >
< Session-Id >
[Vendor-Specific-Application-Id]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
{ Destination-Host }
{ Destination-Realm }
{ User-Name }
*[Supported-Features]
{ Subscription-Data}
[IDR- Flags]
*[AVP]
*[Proxy-Info]
*[Route-Record]

Message Format when used over the S7a or S7d application:

< Insert-Subscriber-Data-Request> ::= < Diameter Header: 319, REQ, PXY, 16777308 >
< Session-Id >
[Vendor-Specific-Application-Id]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
{ Destination-Host }
{ Destination-Realm }
{ User-Name }
*[Supported-Features]
*{ VPLMN-CSG-Subscription-Data }
*[AVP]
*[Proxy-Info]
*[Route-Record]

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- As to the blue hatching, the number of “Supported-Features” to be set is “1”.

- The number of “Proxy-Info” to be set is applicable up to “8”. AVPs are to be discarded if they exceed the maximum value of 8.
- The MME doesn’t check the contents of “Proxy-Info” and “Route-Record”.
- The description hatched with gray is unsupported.

7.2.10 Insert-Subscriber-Data-Answer (IDA) Command

The Insert-Subscriber-Data-Answer (IDA) command, indicated by the Command-Code field set to 319 and the 'R' bit cleared in the Command Flags field, is sent from MME or SGSN to HSS or CSS.

Message Format when used over the S6a or S6d application:

< Insert-Subscriber-Data-Answer> ::= < Diameter Header: 319, PXY, 16777251 >
< Session-Id >
[Vendor-Specific-Application-Id]
*[Supported-Features]
[Result-Code]
[Experimental-Result]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
[IMS-Voice-Over-PS-Sessions-Supported]
[Last-UE-Activity-Time]
[RAT-Type]
[IDA-Flags]
[EPS-User-State]
[EPS-Location-Information]
[Local-Time-Zone]
*[AVP]
*[Failed-AVP]
*[Proxy-Info]
*[Route-Record]

Message Format when used over the S7a or S7d application:

< Insert-Subscriber-Data-Answer> ::= < Diameter Header: 319, PXY, 16777308 >
< Session-Id >
[Vendor-Specific-Application-Id]
*[Supported-Features]
[Result-Code]
[Experimental-Result]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
*[AVP]
*[Failed-AVP]
*[Proxy-Info]
*[Route-Record]

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- As to the blue hatching, the number of “Supported-Features” to be set is is applicable up to “2”.
- The MME sets “Proxy-Info” in IDA when receiving it in IDR.
- The description hatched with gray is unsupported.
- As to the blue hatching, the number of “Failed-AVP” to be set is “1” about the answer signals that the MME sends.

7.2.11 Delete-Subscriber-Data-Request (DSR) Command

The Delete-SubscriberData-Request (DSR) command, indicated by the Command-Code field set to 320 and the 'R' bit set in the Command Flags field, is sent from HSS or CSS to MME or SGSN.

Message Format when used over the S6a/S6d application:

< Delete-Subscriber-Data-Request > ::= < Diameter Header: 320, REQ, PXY, 16777251 >
< Session-Id >
[Vendor-Specific-Application-Id]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
{ Destination-Host }
{ Destination-Realm }
{ User-Name }
*[Supported-Features]
{ DSR-Flags }
*[Context-Identifier]
[Trace-Reference]
*[TS-Code]
*[SS-Code]
*[AVP]
*[Proxy-Info]
*[Route-Record]

Message Format when used over the S7a/S7d application:

< Delete-Subscriber-Data-Request > ::= < Diameter Header: 320, REQ, PXY, 16777308 >
< Session-Id >
[Vendor-Specific-Application-Id]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
{ Destination-Host }
{ Destination-Realm }
{ User-Name }
*[Supported-Features]
{ DSR-Flags }
*[AVP]
*[Proxy-Info]
*[Route-Record]

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- As to the blue hatching, the number of “Supported-Features” to be set is “1”, and the number of “Context-Identifier” to be set is applicable up to “50”.
- The number of “Proxy-Info” to be set is applicable up to “8”. AVPs are to be discarded if they exceed the maximum value of 8.
- The MME doesn’t check the contents of “Proxy-Info” and “Route-Record”.
- The description hatched with gray is unsupported.

7.2.12 Delete-Subscriber-Data-Answer (DSA) Command

The Delete-SubscriberData-Answer (DSA) command, indicated by the Command-Code field set to 320 and the 'R' bit cleared in the Command Flags field, is sent from MME or SGSN to HSS or CSS.

Message Format when used over the S6a/S6d application:

```
< Delete-Subscriber-Data-Answer> ::=    < Diameter Header: 320, PXY, 16777251 >
                                        < Session-Id >
                                        [ Vendor-Specific-Application-Id ]
                                       *[ Supported-Features ]
                                       [ Result-Code ]
                                       [ Experimental-Result ]
                                       { Auth-Session-State }
                                       { Origin-Host }
                                       { Origin-Realm }
                                       [ DSA-Flags ]
                                       *[ AVP ]
                                       *[ Failed-AVP ]
                                           *[ Proxy-Info ]
                                       *[ Route-Record ]
```

Message Format when used over the S7a /S7d application:

```
< Delete-Subscriber-Data-Answer> ::=    < Diameter Header: 320, PXY, 16777308>
                                        < Session-Id >
                                        [ Vendor-Specific-Application-Id ]
                                       *[ Supported-Features ]
                                       [ Result-Code ]
                                       [ Experimental-Result ]
                                       { Auth-Session-State }
                                       { Origin-Host }
                                       { Origin-Realm }
                                       *[ AVP ]
                                       *[ Failed-AVP ]
                                           *[ Proxy-Info ]
                                       *[ Route-Record ]
```

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The MME sets “Proxy-Info” in DSA when receiving it in DSR.
- The description hatched with gray is unsupported.
- As to the blue hatching, the number of “Failed-AVP” to be set is “1” about the answer signals that the MME sends.

7.2.13 Purge-UE-Request (PUR) Command

The Purge-UE-Request (PUR) command, indicated by the Command-Code field set to 321 and the 'R' bit set in the Command Flags field, is sent from MME or SGSN to HSS.

Message Format

```
< Purge-UE-Request> ::=     < Diameter Header: 321, REQ, PXY, 16777251 >
                            < Session-Id >
                                [ Vendor-Specific-Application-Id ]
                            { Auth-Session-State }
                            { Origin-Host }
```

{ Origin-Realm }
[Destination-Host]
{ Destination-Realm }
{ User-Name }
[PUR-Flags]
*[Supported-Features]
*[AVP]
*[Proxy-Info]
*[Route-Record]

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

7.2.14 Purge-UE-Answer (PUA) Command

The Purge-UE-Answer (PUA) command, indicated by the Command-Code field set to 321 and the 'R' bit cleared in the Command Flags field, is sent from HSS to MME or SGSN.

Message Format

< Purge-UE-Answer> ::= < Diameter Header: 321, PXY, 16777251 >
< Session-Id >
[Vendor-Specific-Application-Id]
*[Supported-Features]
[Result-Code]
[Experimental-Result]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
[PUA-Flags]
*[AVP]
*[Failed-AVP]
*[Proxy-Info]
*[Route-Record]
*[Redirect-Host]
[Redirect-Host-Usage]
[Redirect-Max-Cache-Time]

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- As to the blue hatching, the number of “Supported-Features” to be set is “1”.
- The description hatched with gray is unsupported.

7.2.15 Reset-Request (RSR) Command

The Reset-Request (RSR) command, indicated by the Command-Code field set to 322 and the 'R' bit set in the Command Flags field, is sent from HSS to MME or SGSN.

Message Format when used over the S6a/S6d application:

< Reset-Request> ::= < Diameter Header: 322, REQ, PXY, 16777251 >
< Session-Id >
[Vendor-Specific-Application-Id]

{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
{ Destination-Host }
{ Destination-Realm }
*[Supported-Features]
*[User-Id]
*[AVP]
*[Proxy-Info]
*[Route-Record]

Message Format when used over the S7a /S7d application:

< Reset-Request> ::= < Diameter Header: 322, REQ, PXY, 16777308 >
< Session-Id >
[Vendor-Specific-Application-Id]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
{ Destination-Host }
{ Destination-Realm }
*[Supported-Features]
*[AVP]
*[Proxy-Info]
*[Route-Record]

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The number of “Proxy-Info” to be set is applicable up to “8”. AVPs are to be discarded if they exceed the maximum value of 8.
- The MME doesn’t check the contents of “Proxy-Info” and “Route-Record”.
- As to the blue hatching, the number of “Supported-Features” to be set is “1”, and the number of “User-Id” to be set is applicable up to “50”.
- The description hatched with gray is unsupported.

7.2.16 Reset-Answer (RSA) Command

The Reset-Answer (RSA) command, indicated by the Command-Code field set to 322 and the 'R' bit cleared in the Command Flags field, is sent from MME or SGSN to HSS.

Message Format when used over the S6a/S6d application:

< Reset-Answer> ::= < Diameter Header: 322, PXY, 16777251 >
< Session-Id >
[Vendor-Specific-Application-Id]
*[Supported-Features]
[Result-Code]
[Experimental-Result]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
*[AVP]
*[Failed-AVP]
*[Proxy-Info]
*[Route-Record]

Message Format when used over the S7a /S7d application:

< Reset-Answer> ::= < Diameter Header: 322, PXY, 16777308 >
< Session-Id >
[Vendor-Specific-Application-Id]
*[Supported-Features]
[Result-Code]
[Experimental-Result]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
*[AVP]
*[Failed-AVP]
*[Proxy-Info]
*[Route-Record]

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The MME sets “Proxy-Info” in RSA when receiving it in RSR.
- The description hatched with gray is unsupported.
- As to the blue hatching, the number of “Failed-AVP” to be set is “1” about the answer signals that the MME sends.

7.2.17 Notify-Request (NOR) Command

The Notify-Request (NOR) command, indicated by the Command-Code field set to 323 and the 'R' bit set in the Command Flags field, is sent from MME or SGSN to HSS.

Message Format

< Notify-Request> ::= < Diameter Header: 323, REQ, PXY, 16777251 >
< Session-Id >
[Vendor-Specific-Application-Id]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
[Destination-Host]
{ Destination-Realm }
{ User-Name }
* [Supported-Features]
[Terminal-Information]
[MIP6-Agent-Info]
[Visited-Network-Identifier]
[Context-Identifier]
[Service-Selection]
[Alert-Reason]
[UE-SRVCC-Capability]
[NOR-Flags]
[Homogeneous-Support-of-IMS-Voice-Over-PS-Sessions]
*[AVP]
*[Proxy-Info]
*[Route-Record]

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

7.2.18 Notify-Answer (NOA) Command

The Notify-Answer (NOA) command, indicated by the Command-Code field set to 323 and the 'R' bit cleared in the Command Flags field, is sent from HSS to MME or SGSN.

Message Format

< Notify-Answer> ::= < Diameter Header: 323, PXY, 16777251 >
< Session-Id >
[Vendor-Specific-Application-Id]
[Result-Code]
[Experimental-Result]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
*[Supported-Features]
*[AVP]
*[Failed-AVP]
*[Proxy-Info]
*[Route-Record]
*[Redirect-Host]
[Redirect-Host-Usage]
[Redirect-Max-Cache-Time]

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- As to the blue hatching, the number of “Supported-Features” to be set is “1”.
- The description hatched with gray is unsupported.

7.2.19 ME-Identity-Check-Request (ECR) Command

The ME-Identity-Check-Request (ECR) command, indicated by the Command-Code field set to 324 and the 'R' bit set in the Command Flags field, is sent from MME or SGSN to EIR.

Message Format

< ME-Identity-Check-Request > ::= < Diameter Header: 324, REQ, PXY, 16777252 >
< Session-Id >
[Vendor-Specific-Application-Id]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
[Destination-Host]
{ Destination-Realm }
{ Terminal-Information }
[User-Name]
*[AVP]
*[Proxy-Info]
*[Route-Record]

[DOCOMO Compliance]

Compliance : Not Compliance

7.2.20 ME-Identity-Check-Answer (ECA) Command

The ME-Identity-Check-Answer (ECA) command, indicated by the Command-Code field set to 324 and the 'R' bit cleared in the Command Flags field, is sent from EIR to MME or SGSN.

Message Format

```
< ME-Identity-Check-Answer> ::=          < Diameter Header: 324, PXY, 16777252 >
                                         < Session-Id >
                                         [ Vendor-Specific-Application-Id ]
                                         [ Result-Code ]
                                       [ Experimental-Result ]
                                       { Auth-Session-State }
                                       { Origin-Host }
                                       { Origin-Realm }
                                       [ Equipment-Status ]
                                       *[ AVP ]
                                       *[ Failed-AVP ]
                                              *[ Proxy-Info ]
                                       *[ Route-Record ]
```

[DOCOMO Compliance]

Compliance : Not Compliance

7.2.21 Update-VCSG-Location-Request (UVR) Command

The Update-VCSG-Location-Request (UVR) command, indicated by the Command-Code field set to 8388638 and the "R" bit set in the Command Flags field, is sent from MME or SGSN to CSS.

Message Format

```
< Update-VCSG-Location-Request> ::=  < Diameter Header: 8388638, REQ, PXY, 167777308 >
                                     < Session-Id >
                                     [ Vendor-Specific-Application-Id ]
                                     { Auth-Session-State }
                                     { Origin-Host }
                                     { Origin-Realm }
                                     [ Destination-Host ]
                                     { Destination-Realm }
                                     { User-Name }
                                     [ MSISDN ]
                                     [ SGSN-Number ]
                                     *[ Supported-Features ]
                                     { UVR-Flags }
                                     *[ AVP ]
                                              *[ Proxy-Info ]
                                     *[ Route-Record ]
```

[DOCOMO Compliance]

Compliance : Not Compliance

7.2.22 Update-VCSG-Location-Answer (UVA) Command

The Update-VCSG-Location-Answer (UVA) command, indicated by the Command-Code field set to 8388638 and the 'R' bit cleared in the Command Flags field, is sent from CSS to MME or SGSN.

Message Format

```
< Update-VCSG-Location-Answer> ::=  < Diameter Header: 8388638, PXY, 167777308 >
                                    < Session-Id >
                                    [ Vendor-Specific-Application-Id ]
                                    [ Result-Code ]
                                [ Experimental-Result ]
                                [ Error-Diagnostic ]
                                { Auth-Session-State }
                                { Origin-Host }
                                { Origin-Realm }
                                *[ Supported-Features ]
                                *[ VPLMN-CSG-Subscription-Data ]
                                [ UVA-Flags ]
                                *[ AVP ]
                                *[ Failed-AVP ]
                                        *[ Proxy-Info ]
                                *[ Route-Record ]
```

[DOCOMO Compliance]

Compliance : Not Compliance

7.2.23 Cancel-VCSG-Location-Request (CVR) Command

The Cancel-VCSG-Location-Request (CVR) command, indicated by the Command-Code field set to 8388642 and the 'R' bit set in the Command Flags field, is sent from CSS to MME or SGSN.

Message Format

```
< Cancel-VCSG-Location-Request> ::=         < Diameter Header: 8388642, REQ, PXY, 167777308 >
                                    < Session-Id >
                                        [ Vendor-Specific-Application-Id ]
                                    { Auth-Session-State }
                                    { Origin-Host }
                                    { Origin-Realm }
                                    { Destination-Host }
                                    { Destination-Realm }
                                    { User-Name }
                                    *[Supported-Features ]
                                    { Cancellation-Type }
                                    *[ AVP ]
                                    *[ Proxy-Info ]
                                    *[ Route-Record ]
```

[DOCOMO Compliance]

Compliance : Not Compliance

7.2.24 Cancel-VCSG-Location-Answer (CVA) Command

The Cancel-VCSG-Location-Answer (CVA) command, indicated by the Command-Code field set to 8388642 and the 'R' bit cleared in the Command Flags field, is sent from MME or SGSN to CSS.

Message Format

< Cancel-VCSG-Location-Answer> ::= < Diameter Header: 8388642, PXY, 167777308 >
< Session-Id >
[Vendor-Specific-Application-Id]
*[Supported-Features]
[Result-Code]
[Experimental-Result]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
*[AVP]
*[Failed-AVP]
*[Proxy-Info]
*[Route-Record]

[DOCOMO Compliance]

Compliance : Not Compliance

7.3 Information Elements

[DOCOMO Compliance]

Compliance : Not Applicable

Comment :

- *[AVP] is hatched with light blue because of customization AVP.

7.3.1 General

The following table specifies the Diameter AVPs defined for the S6a/S6d interface protocol, the S7a/S7d interface protocol and the S13/S13' interface protocol, their AVP Code values, types, possible flag values and whether or not the AVP may be encrypted. The Vendor-ID header of all AVPs defined in this specification shall be set to 3GPP (10415).

For all AVPs which contain bit masks and are of the type Unsigned32, e.g., ULR-Flags, DSR-Flags, PUA-Flags, etc., bit 0 shall be the least significant bit. For example, to get the value of bit 0, a bit mask of 0x0001 should be used.

Table 7.3.1/1: S6a/S6d, S7a/S7d and S13/S13' specific Diameter AVPs

				AVP Flag rules				
Attribute Name	**AVP Code**	**Section defined**	**Value Type**	**Must**	**May**	**Should not**	**Must not**	**May Encr.**
Subscription-Data	1400	7.3.2	Grouped	M, V				No
Terminal-Information	1401	7.3.3	Grouped	M, V				No
IMEI	1402	7.3.4	UTF8String	M, V				No
Software-Version	1403	7.3.5	UTF8String	M, V				No
QoS-Subscribed	1404	7.3.77	OctetString	M, V				No
ULR-Flags	1405	7.3.7	Unsigned32	M, V				No
ULA-Flags	1406	7.3.8	Unsigned32	M, V				No
Visited-PLMN-Id	1407	7.3.9	OctetString	M, V				No
Requested-EUTRAN-Authentication-Info	1408	7.3.11	Grouped	M, V				No
Requested-UTRAN- GERAN-Authentication-Info	1409	7.3.12	Grouped	M, V				No
Number-Of-Requested-Vectors	1410	7.3.14	Unsigned32	M, V				No
Re-Synchronization-Info	1411	7.3.15	OctetString	M, V				No
Immediate-Response-Preferred	1412	7.3.16	Unsigned32	M, V				No
Authentication-Info	1413	7.3.17	Grouped	M, V				No
E-UTRAN-Vector	1414	7.3.18	Grouped	M, V				No
UTRAN-Vector	1415	7.3.19	Grouped	M, V				No
GERAN-Vector	1416	7.3.20	Grouped	M, V				No
Network-Access-Mode	1417	7.3.21	Enumerated	M, V				No
HPLMN-ODB	1418	7.3.22	Unsigned32	M, V				No
Item-Number	1419	7.3.23	Unsigned32	M, V				No
Cancellation-Type	1420	7.3.24	Enumerated	M, V				No
DSR-Flags	1421	7.3.25	Unsigned32	M, V				No
DSA-Flags	1422	7.3.26	Unsigned32	M, V				No
Context-Identifier	1423	7.3.27	Unsigned32	M, V				No
Subscriber-Status	1424	7.3.29	Enumerated	M, V				No
Operator-Determined-Barring	1425	7.3.30	Unsigned32	M, V				No
Access-Restriction-Data	1426	7.3.31	Unsigned32	M, V				No
APN-OI-Replacement	1427	7.3.32	UTF8String	M, V				No
All-APN-Configurations-Included-Indicator	1428	7.3.33	Enumerated	M, V				No
APN-Configuration-Profile	1429	7.3.34	Grouped	M, V				No
APN-Configuration	1430	7.3.35	Grouped	M, V				No
EPS-Subscribed-QoS-Profile	1431	7.3.37	Grouped	M, V				No
VPLMN-Dynamic-Address-Allowed	1432	7.3.38	Enumerated	M, V				No
STN-SR	1433	7.3.39	OctetString	M, V				No
Alert-Reason	1434	7.3.83	Enumerate	M, V				No
AMBR	1435	7.3.41	Grouped	M, V				No
CSG-Subscription-Data	1436	7.3.78	Grouped	M. V				No
CSG-Id	1437	7.3.79	Unsigned32	M, V				No
PDN-GW-Allocation-Type	1438	7.3.44	Enumerated	M, V				No
Expiration-Date	1439	7.3.80	Time	M, V				No
RAT-Frequency-Selection-Priority-ID	1440	7.3.46	Unsigned32	M, V				No
IDA-Flags	1441	7.3.47	Unsigned32	M, V				No
PUA-Flags	1442	7.3.48	Unsigned32	M, V				No
NOR-Flags	1443	7.3.49	Unsigned32	M, V				No
User-Id	1444	7.3.50	UTF8String	V			M	No
Equipment-Status	1445	7.3.51	Enumerated	M, V				No
Regional-Subscription-Zone-Code	1446	7.3.52	OctetString	M, V				No
RAND	1447	7.3.53	OctetString	M, V				No
XRES	1448	7.3.54	OctetString	M, V				No
AUTN	1449	7.3.55	OctetString	M, V				No
KASME	1450	7.3.56	OctetString	M, V				No
Trace-Collection-Entity	1452	7.3.98	Address	M, V				No
Kc	1453	7.3.59	OctetString	M, V				No
SRES	1454	7.3.60	OctetString	M, V				No
PDN-Type	1456	7.3.62	Enumerated	M, V				No
Roaming-Restricted-Due-To-Unsupported-Feature	1457	7.3.81	Enumerated	M, V				No
Trace-Data	1458	7.3.63	Grouped	M, V				No
Trace-Reference	1459	7.3.64	OctetString	M, V				No

Trace-Depth	1462	7.3.67	Enumerated	M, V				No
Trace-NE-Type-List	1463	7.3.68	OctetString	M, V				No
Trace-Interface-List	1464	7.3.69	OctetString	M, V				No
Trace-Event-List	1465	7.3.70	OctetString	M, V				No
OMC-Id	1466	7.3.71	OctetString	M, V				No
GPRS-Subscription-Data	1467	7.3.72	Grouped	M, V				No
Complete-Data-List-Included-Indicator	1468	7.3.73	Enumerated	M, V				No
PDP-Context	1469	7.3.74	Grouped	M, V				No
PDP-Type	1470	7.3.75	OctetString	M, V				No
3GPP2-MEID	1471	7.3.6	OctetString	M, V				No
Specific-APN-Info	1472	7.3.82	Grouped	M, V				No
LCS-Info	1473	7.3.84	Grouped	M, V				No
GMLC-Number	1474	7.3.85	OctetString	M, V				No
LCS-PrivacyException	1475	7.3.86	Grouped	M, V				No
SS-Code	1476	7.3.87	OctetString	M, V				No
SS-Status	1477	7.3.88	OctetString	M, V				No
Notification-To-UE-User	1478	7.3.89	Enumerated	M, V				No
External-Client	1479	7.3.90	Grouped	M, V				No
Client-Identity	1480	7.3.91	OctetString	M, V				No
GMLC-Restriction	1481	7.3.92	Enumerated	M, V				No
PLMN-Client	1482	7.3.93	Enumerated	M, V				No
Service-Type	1483	7.3.94	Grouped	M, V				No
ServiceTypeIdentity	1484	7.3.95	Unsigned32	M, V				No
MO-LR	1485	7.3.96	Grouped	M, V				No
Teleservice-List	1486	7.3.99	Grouped	M, V				No
TS-Code	1487	7.3.100	OctetString	M, V				No
Call-Barring-Info	1488	7.3.101	Grouped	M, V				No
SGSN-Number	1489	7.3.102	OctetString	M, V				No
IDR-Flags	1490	7.3.103	Unsigned32	M, V				No
ICS-Indicator	1491	7.3.104	Enumerated	V			M	No
IMS-Voice-Over-PS-Sessions-Supported	1492	7.3.106	Enumerated	V			M	No
Homogeneous-Support-of-IMS-Voice-Over-PS-Sessions	1493	7.3.107	Enumerated	V			M	No
Last-UE-Activity-Time	1494	7.3.108	Time	V			M	No
EPS-User-State	1495	7.3.110	Grouped	V			M	No
EPS-Location-Information	1496	7.3.111	Grouped	V			M	No
MME-User-State	1497	7.3.112	Grouped	V			M	No
SGSN-User-State	1498	7.3.113	Grouped	V			M	No
User-State	1499	7.3.114	Enumerated	V			M	No
MME-Location Information	1600	7.3.115	Grouped	V			M	No
SGSN-Location-Information	1601	7.3.116	Grouped	V			M	No
E-UTRAN-Cell-Global-Identity	1602	7.3.117	OctetString	V			M	No
Tracking-Area-Identity	1603	7.3.118	OctetString	V			M	No
Cell-Global-Identity	1604	7.3.119	OctetString	V			M	No
Routing-Area-Identity	1605	7.3.120	OctetString	V			M	No
Location-Area-Identity	1606	7.3.121	OctetString	V			M	No
Service-Area-Identity	1607	7.3.122	OctetString	V			M	No
Geographical-Information	1608	7.3.123	OctetString	V			M	No
Geodetic-Information	1609	7.3.124	OctetString	V			M	No
Current-Location-Retrieved	1610	7.3.125	Enumerated	V			M	No

Age-Of-Location-Information	1611	7.3.126	Unsigned32	V			M	No
Active-APN	1612	7.3.127	Grouped	V			M	No
Error-Diagnostic	1614	7.3.128	Enumerated	V			M	No
Ext-PDP-Address	1621	7.3.129	Address	V			M	No
UE-SRVCC-Capability	1615	7.3.130	Enumerated	V			M	No
MPS-Priority	1616	7.3.131	Unsigned32	V			M	No
VPLMN-LIPA-Allowed	1617	7.3.132	Enumerated	V			M	No
LIPA-Permission	1618	7.3.133	Enumerated	V			M	No
Subscribed-Periodic-RAU-TAU-Timer	1619	7.3.134	Unsigned32	V			M	No
Ext-PDP-Type	1620	7.3.75A	OctetString	V			M	No
SIPTO-Permission	1613	7.3.135	Enumerated	V			M	No
MDT-Configuration	1622	7.3.136	Grouped	V			M	No
Job-Type	1623	7.3.137	Enumerated	V			M	No
Area-Scope	1624	7.3.138	Grouped	V			M	No
List-Of-Measurements	1625	7.3.139	Unsigned32	V			M	No
Reporting-Trigger	1626	7.3.140	Unsigned32	V			M	No
Report-Interval	1627	7.3.141	Enumerated	V			M	No
Report-Amount	1628	7.3.142	Enumerated	V			M	No
Event-Threshold-RSRP	1629	7.3.143	Unsigned32	V			M	No
Event-Threshold-RSRQ	1630	7.3.144	Unsigned32	v			M	No
Logging-Interval	1631	7.3.145	Enumerated	V			M	No
Logging-Duration	1632	7.3.146	Enumerated	V			M	No
Relay-Node-Indicator	1633	7.3.147	Enumerated	V			M	No
MDT-User-Consent	1634	7.3.148	Enumerated	V			M	No
PUR-Flags	1635	7.3.149	Unsigned32	V			M	No
Subscribed-VSRVCC	1636	7.3.150	Enumerated	V			M	No
Equivalent-PLMN-List	1637	7.3.151	Grouped	V			M	No
CLR-Flags	1638	7.3.152	Unsigned32	V			M	No
UVR-Flags	1639	7.3.153	Unsigned32	M, V				No
UVA-Flags	1640	7.3.154	Unsigned32	M, V				No
VPLMN-CSG-Subscription-Data	1641	7.3.155	Grouped	M, V				No
Time-Zone	1642	7.3.163	UTF8String	V			M	No
A-MSISDN	1643	7.3.157	OctetString	V			M	No
MME-Number-for-MT-SMS	1645	7.3.159	OctetString	V			M	No
SMS-Register-Request	1648	7.3.162	Enumerated	V			M	No
Local-Time-Zone	1649	7.3.156	Grouped	V			M	No
Daylight-Saving-Time	1650	7.3.164	Enumerated	V			M	No
Subscription-Data-Flags	1654	7.3.165	Unsigned32	M			V	No

NOTE 1: The AVP header bit denoted as "M", indicates whether support of the AVP is required. The AVP header bit denoted as "V", indicates whether the optional Vendor-ID field is present in the AVP header. For further details, see IETF RFC 3588 [4].

NOTE 2: If the M-bit is set for an AVP and the receiver does not understand the AVP, it shall return a rejection. If the M-bit is not set for an AVP, the receiver shall not return a rejection, whether or not it understands the AVP. If the receiver understands the AVP but the M-bit value does not match with the definition in this table, the receiver shall ignore the M-bit.

The following table specifies the Diameter AVPs re-used by the S6a/S6d interface protocol from existing Diameter Applications, including a reference to their respective specifications and when needed, a short description of their use within S6a and S6d.

Any other AVPs from existing Diameter Applications, except for the AVPs from Diameter Base Protocol, do not need to be supported. The AVPs from Diameter Base Protocol are not included in table 7.3.1/2, but they may be re-used for the S6a/S6d protocol, the S7a/S7protocol and the S13/S13' protocol.

Table 7.3.1/2: S6a/S6d, S7a/S7d and S13/S13' re-used Diameter AVPs

Attribute Name	Reference	Comments	M-bit	AVP Code
Service-Selection	IETF RFC 5778 [20]	See section 7.3.36		493
3GPP-Charging-Characteristics	3GPP TS 29.061 [21]	See 3GPP TS 32.251 [33] Annex A and 3GPP TS 32.298 [22] section 5.1.2.2.7 This attribute holds the EPS PDN Connection Charging Characteristics data for an EPS APN Configuration, or the PDP context Charging Characteristics for GPRS PDP context, or the Subscribed Charging Characteristics data for the subscriber level 3GPP Charging Characteristics; refer to 3GPP TS 23.008 [30].		13
Supported-Features	3GPP TS 29.229 [9]			628
Feature-List-ID	3GPP TS 29.229 [9]			629
Feature-List	3GPP TS 29.229 [9]	See section 7.3.10		630
Served-Party-IP-Address	3GPP TS 32.299 [8]	holds the PDN IP Address of the user		848
QoS-Class-Identifier	3GPP TS 29.212 [10]			1028
Allocation-Retention-Priority	3GPP TS 29.212 [10]	See section 7.3.40		1034
Priority-Level	3GPP TS 29.212 [10]			1046
Pre-emption-Capability	3GPP TS 29.212 [10]			1047
Pre-emption-Vulnerability	3GPP TS 29.212 [10]			1048
Max-Requested-Bandwidth-DL	3GPP TS 29.214 [11]			515
Max-Requested-Bandwidth-UL	3GPP TS 29.214 [11]			516
RAT-Type	3GPP TS 29.212 [10]	See section 7.3.13	Must set	1032
MSISDN	3GPP TS 29.329 [25]			701
MIP6-Agent-Info	IETF Draft RFC 5447 [26]			486
MIP-Home-Agent-Address	IETF RFC 4004 [27]			334
MIP-Home-Agent-Host	IETF RFC 4004 [27]			348
PDP-Address	3GPP TS 32.299 [8]			1227
Confidentiality-Key	3GPP TS 29.229 [9]	See section 7.3.57		625
Integrity-Key	3GPP TS 29.229 [9]	See section 7.3.58		626
Visited-Network-Identifier	3GPP TS 29.229 [9]	See section 7.3.105	Must not set	600
GMLC-Address	3GPP TS 29.173 [37]	See section 7.3.109	Must not set	2405

Attribute Name	Reference	Comments	M-bit	AVP Code
User-CSG-Information	3GPP TS 32.299 [8]		Must not set	2319
NOTE 1: The M-bit settings for re-used AVPs override those of the defining specifications that are referenced. Values include: "Must set", "Must not set". If the M-bit setting is blank, then the defining specification applies. NOTE 2: If the M-bit is set for an AVP and the receiver does not understand the AVP, it shall return a rejection. If the M-bit is not set for an AVP, the receiver shall not return a rejection, whether or not it understands the AVP. If the receiver understands the AVP but the M-bit value does not match with the definition in this table, the receiver shall ignore the M-bit.				

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported. Unsupported parameters are not set when sending and are discarded when receiving.
- “HPLMN-ODB” is the parameter of each operator’s own.
- The MME doesn’t discard “Regional-Subscription-Zone-Code” when receiving, and ignores it.

7.3.2 Subscription-Data

The Subscription-Data AVP is of type Grouped. It shall contain the information related to the user profile relevant for EPS and GERAN/UTRAN.

AVP format:

Subscription-Data ::= <AVP header: 1400 10415>

[Subscriber-Status]

[MSISDN]

[A-MSISDN]

[STN-SR]

[ICS-Indicator]

[Network-Access-Mode]

[Operator-Determined-Barring]

[HPLMN-ODB]

*10[Regional-Subscription-Zone-Code]

[Access-Restriction-Data]

[APN-OI-Replacement]

[LCS-Info]

[Teleservice-List]

[Call-Barring-Info]

[3GPP-Charging-Characteristics]

[AMBR]

[APN-Configuration-Profile]

[RAT-Frequency-Selection-Priority-ID]

[Trace-Data]

[GPRS-Subscription-Data]

*[CSG-Subscription-Data]

[Roaming-Restricted-Due-To-Unsupported-Feature]

[Subscribed-Periodic-RAU-TAU-Timer]

[MPS-Priority]

[VPLMN-LIPA-Allowed]

[Relay-Node-Indicator]

[MDT-User-Consent]

[Subscribed-VSRVCC]

[Subscription-Data-Flags]

*[AVP]

The AMBR included in this grouped AVP shall include the AMBR associated to the user's subscription (UE-AMBR); Max-Requested-Bandwidth-UL and Max-Requested-Bandwidth-DL within this AVP shall not both be set to "0".

The APN-OI-Replacement included in this grouped AVP shall include the UE level APN-OI-Replacement associated to the user's subscription.

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- As to the blue hatching, the number of "Regional-Subscription-Zone-Code" to be set is applicable up to "10".
- The description hatched with gray is unsupported. These parameters are discarded when receiving.
- "MSISDN" must be set.

7.3.3 Terminal-Information

The Terminal-Information AVP is of type Grouped. This AVP shall contain the information about the user's terminal.

AVP format

Terminal Information ::= <AVP header: 1401 10415>

[IMEI]

[3GPP2-MEID]

[Software-Version]

*[AVP]

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

7.3.4 IMEI

The IMEI AVP is of type UTF8String. This AVP shall contain the International Mobile Equipment Identity, as specified in 3GPP TS 23.003 [3]. It should consist of 14 digits, including the 8-digit Type Allocation Code (TAC) and the 6-digit Serial Number (SNR). It may also include a 15th digit.

[DOCOMO Compliance]

Compliance : Full Compliance

Comment :

- The MME sets “0” at the spare bit of 15th digit.

7.3.5 Software-Version

The Software-Version AVP is of type UTF8String. This AVP shall contain the 2-digit Software Version Number (SVN) of the International Mobile Equipment Identity, as specified in 3GPP TS 23.003 [3].

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.6 3GPP2-MEID

This AVP is of type OctetString. This AVP contains the Mobile Equipment Identifier of the user's terminal. For further details on the encoding of the AVP data, refer to the encoding of the Mobile Identity (MEID) octets 3 to 10 in 3GPP2 A.S0022 [28] Annex A.

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.7 ULR-Flags

The ULR-Flags AVP is of type Unsigned32 and it shall contain a bit mask. The meaning of the bits shall be as defined in table 7.3.7/1:

Table 7.3.7/1: ULR-Flags

Bit	Name	Description
0	Single-Registration-Indication	This bit, when set, indicates that the HSS shall send Cancel Location to the SGSN. An SGSN shall not set this bit when sending ULR.
1	S6a/S6d-Indicator	This bit, when set, indicates that the ULR message is sent on the S6a interface, i.e. the source node is an MME (or a combined MME/SGSN to which the UE is attached via E-UTRAN). This bit, when cleared, indicates that the ULR message is sent on the S6d interface, i.e. the source node is an SGSN (or a combined MME/SGSN to which the UE is attached via UTRAN or GERAN).
2	Skip Subscriber Data	This bit, when set, indicates that the HSS may skip subscription data in ULA. If the subscription data has changed in the HSS after the last successful update of the MME/SGSN, the HSS shall ignore this bit and send the updated subscription data. If the HSS effectively skips the sending of subscription data, the GPRS-Subscription-Data-Indicator flag can be ignored.
3	GPRS-Subscription-Data-Indicator	This bit, when set, indicates that the HSS shall include in the ULA command the GPRS subscription data, if available in the HSS; it shall be included in the GPRS-Subscription-Data AVP inside the Subscription-Data AVP (see 7.3.2). Otherwise, the HSS shall not include the GPRS-Subscription-Data AVP in the response, unless the Update Location Request is received over the S6d interface and there is no APN configuration profile stored for the subscriber, or when the subscription data is returned by a Pre-Rel-8 HSS (via an IWF). A standalone MME shall not set this bit when sending a ULR.
4	Node-Type-Indicator	This bit, when set, indicates that the requesting node is a combined MME/SGSN. This bit, when cleared, indicates that the requesting node is a single MME or SGSN; in this case, if the S6a/S6d-Indicator is set, the HSS may skip the check of those supported features only applicable to the SGSN, and if, in addition the MME does not request to be registered for SMS, the HSS may consequently skip the download of the SMS related subscription data to a standalone MME. NOTE2
5	Initial-Attach-Indicator	This bit, when set, indicates that the HSS shall send Cancel Location to the MME or SGSN if there is the MME or SGSN registration.
6	PS-LCS-Not-Supported-By-UE	This bit, when set, indicates to the HSS that the UE does not support neither UE Based nor UE Assisted positioning methods for Packet Switched Location Services. The MME shall set this bit on the basis of the UE capability information. The SGSN shall set this bit on the basis of the UE capability information and the access technology supported by the SGSN.
7	SMS-Only-Indication	This bit, when set, indicates that the UE indicated "SMS only" when requesting a combined IMSI attach or combined RA/LU.
NOTE1: Bits not defined in this table shall be cleared by the sending MME or SGSN and discarded by the receiving HSS. NOTE2: If the MME is registered for SMS then the HSS will download the SMS related data also for the standalone MME.		

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

7.3.8 ULA-Flags

The ULA-Flags AVP is of type Unsigned32 and it shall contain a bit mask. The meaning of the bits shall be as defined in table 7.3.8/1:

Table 7.3.8/1: ULA-Flags

Bit	Name	Description
0	Separation Indication	This bit, when set, indicates that the HSS stores SGSN number and MME number in separate memory. A Rel-8 HSS shall set the bit. An IWF interworking with a pre Rel-8 HSS/HLR shall clear the bit.
1	MME Registered for SMS	This bit, when set, indicates that the HSS has registered the MME for SMS.
NOTE:	Bits not defined in this table shall be cleared by the sending HSS and discarded by the receiving MME or SGSN.	

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

7.3.9 Visited-PLMN-Id

The Visited-PLMN-Id AVP is of type OctetString. This AVP shall contain the concatenation of MCC and MNC. See 3GPP TS 23.003 [3]. The content of this AVP shall be encoded as an octet string according to table 7.3.9-1.

See 3GPP TS 24.008 [31], clause 10.5.1.13, PLMN list, for the coding of MCC and MNC. If MNC is 2 digits long, bits 5 to 8 of octet 2 are coded as "1111".

Table 7.3.9/1: Encoding format for Visited-PLMN-Id AVP

8	7	6	5	4	3	2	1	
MCC digit 2				MCC digit 1				octet 1
MNC digit 3				MCC digit 3				octet 2
MNC digit 2				MNC digit 1				octet 3

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.10 Feature-List AVP

[DOCOMO Compliance]

Compliance : Not Applicable

7.3.10.1 Feature-List AVP for the S6a/S6d application

The syntax of this AVP is defined in 3GPP TS 29.229 [9].

For the S6a/S6d application, the meaning of the bits shall be as defined in table 7.3.10/1. for the Feature-List-ID 1 and in table 7.3.10/2 for the Feature-List-ID 2.

Table 7.3.10/1: Features of Feature-List-ID 1 used in S6a/S6d

Feature bit	Feature	M/O	Description
0	ODB-all-APN	O	Operator Determined Barring of all Packet Oriented Services This feature is applicable for the ULR/ULA and IDR/IDA command pairs. If the MME or SGSN does not support this feature, the HSS shall not send this ODB barring category to the MME or SGSN within ULA. Instead the HSS may reject location update by sending DIAMETER_ERROR_ROAMING_NOT_ALLOWED and, optionally, including the type of ODB in the Error-Diagnostic AVP. If the MME or SGSN does not indicate support of this feature in IDA and the HSS has sent this ODB category within IDR, the HSS may apply barring of roaming and send CLR.
1	ODB-HPLMN-APN	O	Operator Determined Barring of Packet Oriented Services from access points that are within the HPLMN whilst the subscriber is roaming in a VPLMN This feature is applicable for the ULR/ULA and IDR/IDA command pairs. If the MME or SGSN does not support this feature, the HSS shall not send this ODB barring category to the MME or SGSN within ULA. Instead the HSS may reject location update by sending DIAMETER_ERROR_ROAMING_NOT_ALLOWED and, optionally, including the type of ODB in the Error-Diagnostic AVP. If the MME or SGSN does not indicate support of this feature in IDA and the HSS has sent this ODB category within IDR, the HSS may apply barring of roaming and send CLR.
2	ODB-VPLMN-APN	O	Operator Determined Barring of Packet Oriented Services from access points that are within the roamed to VPLMN This feature is applicable for the ULR/ULA and IDR/IDA command pairs. If the MME or SGSN does not support this feature, the HSS shall not send this ODB barring category to the MME or SGSN within ULA. Instead the HSS may reject location update by sending DIAMETER_ERROR_ROAMING_NOT_ALLOWED and, optionally, including the type of ODB in the Error-Diagnostic AVP. If the MME or SGSN does not indicate support of this feature in IDA and the HSS has sent this ODB category within IDR, the HSS may apply barring of roaming and send CLR.
3	ODB-all-OG		Operator Determined Barring of all outgoing calls This feature is applicable for the ULR/ULA and IDR/IDA command pairs. If the MME or SGSN does not support this feature, the HSS shall not send this ODB barring category to the MME or SGSN within ULA. Instead the HSS may reject location update. If the MME or SGSN does not indicate support of this feature in IDA and the HSS has sent this ODB category within IDR, the HSS may apply barring of roaming and send CLR.
4	ODB-all-InternationalOG	O	Operator Determined Barring of all outgoing international calls This feature is applicable for the ULR/ULA and IDR/IDA command pairs.If the MME or SGSN does not support this feature, the HSS shall not send this ODB barring category to the MME or SGSN within ULA. Instead the HSS may reject location update. If the MME or SGSN does not indicate support of this feature in IDA and the HSS has sent this ODB category within IDR, the HSS may apply barring of roaming and send CLR.
5	ODB-all-InternationalOGNotToHPLMN-Country	O	Operator Determined Barring of all outgoing international calls except those directed to the home PLMN country This feature is applicable for the ULR/ULA and IDR/IDA command pairs. If the MME or SGSN does not support this feature, the HSS shall not send this ODB barring category to the MME or SGSN within ULA. Instead the HSS may reject location update. If the MME or SGSN does not indicate support of this feature in IDA and the HSS has sent this ODB category within IDR, the HSS may apply barring of roaming and send CLR.

6	ODB-all-Interzonal OG	O	Operator Determined Barring of all outgoing inter-zonal calls This feature is applicable for the ULR/ULA and IDR/IDA command pairs. If the MME or SGSN does not support this feature, the HSS shall not send this ODB barring category to the MME or SGSN within ULA. Instead the HSS may reject location update. If the MME or SGSN does not indicate support of this feature in IDA and the HSS has sent this ODB category within IDR, the HSS may apply barring of roaming and send CLR.
7	ODB-all-Interzonal OGNotTo HPLMN-Country	O	Operator Determined Barring of all outgoing inter-zonal calls except those directed to the home PLMN country This feature is applicable for the ULR/ULA and IDR/IDA command pairs. If the MME or SGSN does not support this feature, the HSS shall not send this ODB barring category to the MME or SGSN within ULA. Instead the HSS may reject location update. If the MME or SGSN does not indicate support of this feature in IDA and the HSS has sent this ODB category within IDR, the HSS may apply barring of roaming and send CLR.
8	ODB-all-Interzonal OGAndInt ernational OGNotTo HPLMN-Country	O	Operator Determined Barring of all outgoing international calls except those directed to the home PLMN country and Barring of all outgoing inter-zonal calls This feature is applicable for the ULR/ULA and IDR/IDA command pairs. If the MME or SGSN does not support this feature, the HSS shall not send this ODB barring category to the MME or SGSN within ULA. Instead the HSS may reject location update. If the MME or SGSN does not indicate support of this feature in IDA and the HSS has sent this ODB category within IDR, the HSS may apply barring of roaming and send CLR.
9	RegSub	O	Regional Subscription This feature is applicable for the ULR/ULA, IDR/IDA and DSR/DSA command pairs. If the MME or SGSN does not support this feature, the HSS shall not send Regional Subscription Zone Codes to the MME or SGSN within ULA. Instead the HSS may reject location update. If the MME or SGSN does not indicate support of this feature in IDA and the HSS has sent Regional Subscription Zone Codes within IDR, the HSS may apply barring of roaming and send CLR.
10	Trace	O	Trace Function This feature is applicable for the ULR/ULA, IDR/IDA and DSR/DSA command pairs. If the MME or SGSN does not indicate support of this feature in ULR, the HSS shall not send Trace Data to the MME or SGSN within ULA. If the MME or SGSN does not indicate support of this feature in IDA, and the HSS has sent Trace Data within IDR, the HSS may store this indication, and not send any further Trace Data to that MME or SGSN. If the MME or SGSN does not indicate support of this feature in DSA, and the HSS has sent Trace Data within DSR, the HSS may store this indication, and not send any further Trace Data to that MME or SGSN
11	LCS-all-PrivExcep	O	All LCS Privacy Exception Classes This feature is applicable for the ULR/ULA and IDR/IDA command pairs over the S6d interface. If the SGSN does not support this feature, the HSS shall not send the related LCS information to the SGSN within ULA. If the SGSN does not indicate support of this feature in IDA, and the HSS has sent the related LCS information within IDR, the HSS may store this indication, and not send any further LCS information to that SGSN.

12	LCS-Universal	O	Allow location by any LCS client This feature is applicable for the ULR/ULA and IDR/IDA command pairs over the S6d interface. If the SGSN does not support this feature, the HSS shall not send the related LCS information to the SGSN within ULA. If the SGSN does not indicate support of this feature in IDA, and the HSS has sent the related LCS information within IDR, the HSS may store this indication, and not send any further LCS information to that SGSN.
13	LCS-CallSessionRelated	O	Allow location by any value added LCS client to which a call/session is established from the target UE This feature is applicable for the ULR/ULA and IDR/IDA command pairs over the S6d interface. If the SGSN does not support this feature, the HSS shall not send the related LCS information to the SGSN within ULA. If the SGSN does not indicate support of this feature in IDA, and the HSS has sent the related LCS information within IDR, the HSS may store this indication, and not send any further LCS information to that SGSN.
14	LCS-CallSessionUnrelated	O	Allow location by designated external value added LCS clients This feature is applicable for the ULR/ULA and IDR/IDA command pairs over the S6d interface. If the SGSN does not support this feature, the HSS shall not send the related LCS information to the SGSN within ULA. If the SGSN does not indicate support of this feature in IDA, and the HSS has sent the related LCS information within IDR, the HSS may store this indication, and not send any further LCS information to that SGSN.
15	LCS-PLMNOperator	O	Allow location by designated PLMN operator LCS clients This feature is applicable for the ULR/ULA and IDR/IDA command pairs over the S6d interface. If the SGSN does not support this feature, the HSS shall not send the related LCS information to the SGSN within ULA. If the SGSN does not indicate support of this feature in IDA, and the HSS has sent the related LCS information within IDR, the HSS may store this indication, and not send any further LCS information to that SGSN.
16	LCS-ServiceType	O	Allow location by LCS clients of a designated LCS service type This feature is applicable for the ULR/ULA and IDR/IDA command pairs over the S6d interface. If the SGSN does not support this feature, the HSS shall not send the related LCS information to the SGSN within ULA. If the SGSN does not indicate support of this feature in IDA, and the HSS has sent the related LCS information within IDR, the HSS may store this indication, and not send any further LCS information to that SGSN.
17	LCS-all-MOLR-SS	O	All Mobile Originating Location Request Classes This feature is applicable for the ULR/ULA and IDR/IDA command pairs. If the MME or SGSN does not support this feature, the HSS shall not send the related LCS information to the MME or SGSN within ULA. If the MME or SGSN does not indicate support of this feature in IDA, and the HSS has sent the related LCS information within IDR, the HSS may store this indication, and not send any further LCS information to that MME or SGSN.

18	LCS-BasicSelfLocation	O	Allow an MS to request its own location This feature is applicable for the ULR/ULA and IDR/IDA command pairs. If the MME or SGSN does not support this feature, the HSS shall not send the related LCS information to the MME or SGSN within ULA. If the MME or SGSN does not indicate support of this feature in IDA, and the HSS has sent the related LCS information within IDR, the HSS may store this indication, and not send any further LCS information to that MME or SGSN.
19	LCS-AutonomousSelfLocation	O	Allow an MS to perform self location without interaction with the PLMN This feature is applicable for the ULR/ULA and IDR/IDA command pairs. If the MME or SGSN does not support this feature, the HSS shall not send the related LCS information to the MME or SGSN within ULA. If the MME or SGSN does not indicate support of this feature in IDA, and the HSS has sent the related LCS information within IDR, the HSS may store this indication, and not send any further LCS information to that MME or SGSN.
20	LCS-TransferToThirdParty	O	Allow an MS to request transfer of its location to another LCS client This feature is applicable for the ULR/ULA and IDR/IDA command pairs. If the MME or SGSN does not support this feature, the HSS shall not send the related LCS information to the MME or SGSN within ULA. If the MME or SGSN does not indicate support of this feature in IDA, and the HSS has sent the related LCS information within IDR, the HSS may store this indication, and not send any further LCS information to that MME or SGSN.
21	SM-MO-PP	O	Short Message MO-PP This feature is applicable for the ULR/ULA and IDR/IDA command pairs. If the MME or SGSN does not support this feature, the HSS shall not send the related SMS information to the MME or SGSN within ULA. If the MME or SGSN does not indicate support of this feature in IDA, and the HSS has sent the related SMS information within IDR, the HSS may store this indication, and not send any further SMS information to that MME or SGSN.
22	Barring-Outgoing Calls	O	Barring of Outgoing Calls This feature is applicable for the ULR/ULA and IDR/IDA command pairs. If the MME or SGSN does not support this feature, the HSS shall not send the related SMS information to the MME or SGSN within ULA. If the MME or SGSN does not indicate support of this feature in IDA, and the HSS has sent the related SMS information within IDR, the HSS may store this indication, and not send any further SMS information to that MME or SGSN.
23	BAOC	O	Barring of all outgoing calls This feature is applicable for the ULR/ULA and IDR/IDA command pairs. If the MME or SGSN does not support this feature, the HSS shall not send the related SMS information to the MME or SGSN within ULA. If the MME or SGSN does not indicate support of this feature in IDA, and the HSS has sent the related SMS information within IDR, the HSS may store this indication, and not send any further SMS information to that MME or SGSN.
24	BOIC	O	Barring of outgoing international calls This feature is applicable for the ULR/ULA and IDR/IDA command pairs. If the SGSN does not support this feature, the HSS shall not send the related SMS information to the MME or SGSN within ULA. If the MME or SGSN does not indicate support of this feature in IDA, and the HSS has sent the related SMS information within IDR, the HSS may store this indication, and not send any further SMS information to that MME or SGSN.

25	BOICExHC	O	Barring of outgoing international calls except those directed to the home PLMN Country This feature is applicable for the ULR/ULA and IDR/IDA command pairs. If the MME or SGSN does not support this feature, the HSS shall not send the related SMS information to the MME or SGSN within ULA. If the MME or SGSN does not indicate support of this feature in IDA, and the HSS has sent the related SMS information within IDR, the HSS may store this indication, and not send any further SMS information to that MME or SGSN.
26	UE-Reachability-Notification	O	UE Reachability Notifcation This feature is applicable for the ULR/ULA and IDR/IDA command pairs, over S6a and S6d. If the MME or SGSN indicates in the ULR command that it does not support the UE-Reachability-Notifications, the HSS shall not set the "UE-Reachability-Request" bit in IDR-Flags in subsequent IDR commands towards that MME or SGSN.
27	T-ADS Data Retrieval	O	Terminating Access Domain Selection Data Retrieval This feature is applicable for the ULR/ULA and IDR/IDA command pairs, over S6a and S6d. If the MME or SGSN indicates in the ULR command that it does not support the retrieval of T-ADS data via IDR/IDA commands, the HSS shall not set the "T-ADS Data Request" bit in IDR-Flags in subsequent IDR commands towards that MME or SGSN.
28	State/Location-Information-Retrieval	O	State/Location Information Retrieval This feature is applicable for the ULR/ULA and IDR/IDA command pairs, over S6a and S6d. If the MME or SGSN indicates in the ULR command that it does not support State/Location Information Retrieval, the HSS shall not set the "EPS User State Request", "EPS Location Information Request" or "Current Location Request" bits in IDR-Flags in subsequent IDR commands towards that MME or SGSN.
29	Partial Purge	O	Partial Purge from a Combined MME/SGSN This feature is applicable for the ULR/ULA and PUR/PUA command pairs, over S6a and S6d. If the HSS indicates in the ULA command that it does not support Partial Purge, the combined MME/SGSN shall not include in the PUR command the indication of the specific serving node where the Purge has been done.
30	Local Time Zone Retrieval	O	UE Time Zone Retrieval This feature is applicable for the ULR/ULA and IDR/IDA command pairs, over S6a and S6d. If the MME or SGSN indicates in the ULR command that it does not support the retrieval of Local Time Zone via IDR/IDA commands, the HSS shall not set the "Local Time Zone Request" bit in IDR-Flags in subsequent IDR commands towards that MME or SGSN.
31	Additional MSISDN	O	Additional MSISDN This feature is applicable for the ULR/ULA, IDR/IDA and DSR/DSA command pairs, over S6a and S6d. If the MME or SGSN indicates in the ULR command that it does not support A-MSISDN, the HSS shall populate the MSISDN AVP either with the subscribed MSISDN or the subscribed additional MSISDN based on operator policy and availability and the HSS shall not send IDR with the A-MSISDN AVP or DSR with the "A-MSISDN Withdrawal" bit to the serving nodes when the subscription data is changed.

Feature bit: The order number of the bit within the Supported-Features AVP, e.g. "1".
Feature: A short name that can be used to refer to the bit and to the feature, e.g. "ODB-HPLMN-APN".
M/O: Defines if the implementation of the feature is mandatory ("M") or optional ("O").
Description: A clear textual description of the feature.

Table 7.3.10/2: Features of Feature-List-ID 2 used in S6a/S6d

Feature bit	Feature	M/O	Description
0	SMS in MME	O	SMS in MME This feature is applicable for the ULR/ULA, IDR/IDA, DSR/DSA, NOR/NOA command pairs, over S6a. It is used by the MME to notify the HSS it is capable of SMS transfer without the need of establishing an SGs association with an MSC. If the MME does not support this feature, the HSS shall not send the related SMS information to the MME within ULA. If the MME does not indicate support of this feature in IDA, and the HSS has sent the related SMS information within IDR, the HSS may store this indication, and not send any further SMS information to that MME. If the HSS does not support this feature, the HSS shall ignore any request for a registration for SMS; the MME may store this feature indication, and not send any further request for a registration for SMS to the HSS.
1	SMS in SGSN	O	SMS in SGSN This feature is applicable for the ULR/ULA command pair, over S6d. If the SGSN indicates in the ULR command that it does not support this feature, the HSS shall not indicate "SMS in SGSN Allowed" to the SGSN.
2	Dia-LCS-all-PrivExcep	O	All LCS Privacy Exception Classes This feature is applicable for the ULR/ULA and IDR/IDA command pairs over the S6d interface, when the SGSN supports Diameter based Lgd interface. If the SGSN does not support this feature, the HSS shall not send the related LCS information to the SGSN within ULA. If the SGSN does not indicate support of this feature in IDA, and the HSS has sent the related LCS information within IDR, the HSS may store this indication, and not send any further LCS information to that SGSN.
3	Dia-LCS-Universal	O	Allow location by any LCS client This feature is applicable for the ULR/ULA and IDR/IDA command pairs over the S6d interface, when the SGSN supports Diameter based Lgd interface. If the SGSN does not support this feature, the HSS shall not send the related LCS information to the SGSN within ULA. If the SGSN does not indicate support of this feature in IDA, and the HSS has sent the related LCS information within IDR, the HSS may store this indication, and not send any further LCS information to that SGSN.
4	Dia-LCS-CallSessionRelated	O	Allow location by any value added LCS client to which a call/session is established from the target UE This feature is applicable for the ULR/ULA and IDR/IDA command pairs over the S6d interface, when the SGSN supports Diameter based Lgd interface. If the SGSN does not support this feature, the HSS shall not send the related LCS information to the SGSN within ULA. If the SGSN does not indicate support of this feature in IDA, and the HSS has sent the related LCS information within IDR, the HSS may store this indication, and not send any further LCS information to that SGSN.
5	Dia-LCS-CallSessionUnrelated	O	Allow location by designated external value added LCS clients This feature is applicable for the ULR/ULA and IDR/IDA command pairs over the S6d interface, when the SGSN supports Diameter based Lgd interface. If the SGSN does not support this feature, the HSS shall not send the related LCS information to the SGSN within ULA. If the SGSN does not indicate support of this feature in IDA, and the HSS has sent the related LCS information within IDR, the HSS may store this indication, and not send any further LCS information to that SGSN.

6	Dia-LCS-PLMNOperator	O	Allow location by designated PLMN operator LCS clients This feature is applicable for the ULR/ULA and IDR/IDA command pairs over the S6d interface, when the SGSN supports Diameter based Lgd interface. If the SGSN does not support this feature, the HSS shall not send the related LCS information to the SGSN within ULA. If the SGSN does not indicate support of this feature in IDA, and the HSS has sent the related LCS information within IDR, the HSS may store this indication, and not send any further LCS information to that SGSN.
7	Dia-LCS-ServiceType	O	Allow location by LCS clients of a designated LCS service type This feature is applicable for the ULR/ULA and IDR/IDA command pairs over the S6d interface, when the SGSN supports Diameter based Lgd interface. If the SGSN does not support this feature, the HSS shall not send the related LCS information to the SGSN within ULA. If the SGSN does not indicate support of this feature in IDA, and the HSS has sent the related LCS information within IDR, the HSS may store this indication, and not send any further LCS information to that SGSN.
8	Dia-LCS-all-MOLR-SS	O	All Mobile Originating Location Request Classes This feature is applicable for the ULR/ULA and IDR/IDA command pairs over the S6d interface, when the SGSN supports Diameter based Lgd interface. If the SGSN does not support this feature, the HSS shall not send the related LCS information to the SGSN within ULA. If the SGSN does not indicate support of this feature in IDA, and the HSS has sent the related LCS information within IDR, the HSS may store this indication, and not send any further LCS information to that SGSN.
9	Dia-LCS-BasicSelfLocation	O	Allow an MS to request its own location This feature is applicable for the ULR/ULA and IDR/IDA command pairs over the S6d interface, when the SGSN supports Diameter based Lgd interface. If the SGSN does not support this feature, the HSS shall not send the related LCS information to the SGSN within ULA. If the SGSN does not indicate support of this feature in IDA, and the HSS has sent the related LCS information within IDR, the HSS may store this indication, and not send any further LCS information to that SGSN.
10	Dia-LCS-AutonomousSelfLocation	O	Allow an MS to perform self location without interaction with the PLMN This feature is applicable for the ULR/ULA and IDR/IDA command pairs over the S6d interface, when the SGSN supports Diameter based Lgd interface. If the SGSN does not support this feature, the HSS shall not send the related LCS information to the SGSN within ULA. If the SGSN does not indicate support of this feature in IDA, and the HSS has sent the related LCS information within IDR, the HSS may store this indication, and not send any further LCS information to that SGSN.
11	Dia-LCS-TransferToThirdParty	O	Allow an MS to request transfer of its location to another LCS client This feature is applicable for the ULR/ULA and IDR/IDA command pairs over the S6d interface, when the SGSN supports Diameter based Lgd interface. If the SGSN does not support this feature, the HSS shall not send the related LCS information to the SGSN within ULA. If the SGSN does not indicate support of this feature in IDA, and the HSS has sent the related LCS information within IDR, the HSS may store this indication, and not send any further LCS information to that SGSN.

16	P-CSCF Restoration	O	Support of P-CSCF Restoration This feature is applicable to the ULR/ULA and IDR/IDA command pairs over the S6a or S6d interfaces, when the MME or SGSN supports the execution of the P-CSCF restoration procedures. If the MME or the SGSN does not indicate support of this feature in ULR, the HSS shall not send subsequent IDR commands requesting the execution of HSS-based P-CSCF restoration procedures, as described in 3GPP TS 23.380 [51] subclause 5.4.
20	Dedicated Core Networks	O	Support of Dedicated Core Networks This feature is applicable to the ULR/ULA and IDR/IDA command pairs over the S6a and S6d interfaces. If the MME/SGSN does not indicate support of this feature in the ULR command, the HSS shall not send DCN-related subscription data (e.g., UE Usage Type) in ULA, and shall not send subsequent IDR commands when such subscription data are updated. If the MME/SGSN does not indicate support of this feature in the IDA command and the HSS has already sent DCN-related subscription data in IDR, the HSS may store this indication and not send further updates related to DCN subscription data.
27	NR as Secondary RAT	O	Support of NR as Secondary RAT This feature is applicable to the ULR/ULA and IDR/IDA command pairs over S6a (and S6d) when the MME (or combined MME/SGSN) supports NR as Secondary RAT, and over S6d when the SGSN supports the indication related to NR as Secondary RAT (such as, e.g., the related Access Restriction Data, or extended QoS parameters). If the MME, SGSN, or combined MME/SGSN does not support this feature, the HSS shall not send (in ULA) or update (in IDR) subscription data related to NR as Secondary RAT. If the HSS does not support this feature, the MME shall ignore the bit "NR as Secondary RAT Not Allowed" in Access-Restriction-Data.
Feature bit: The order number of the bit within the Supported-Features AVP, e.g. "1". Feature: A short name that can be used to refer to the bit and to the feature, e.g. "SMS in MME". M/O: Defines if the implementation of the feature is mandatory ("M") or optional ("O"). Description: A clear textual description of the feature.			

Features that are not indicated in the Supported-Features AVPs within a given application message shall not be used to construct that message.

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- If the HSS does not support "NR as Secondary RAT(bit 27)", the MME ignores the bit "NR as Secondary RAT Not Allowed" in Access-Restriction-Data, and keeps "NR as Secondary RAT Not Allowed" bit as 1.
- The description hatched with gray is unsupported.

7.3.10.2 Feature-List AVP for the S7a/S7d application

For the S7a/S7d application, the feature list does not contain any feature in this release.

[DOCOMO Compliance]

Compliance : Not Applicable

7.3.11 Requested-EUTRAN-Authentication-Info

The Requested-EUTRAN-Authentication-Info is of type Grouped. It shall contain the information related to the authentication requests for E-UTRAN.

AVP format

Requested- EUTRAN-Authentication-Info ::= <AVP header: 1408 10415>

[Number-Of-Requested-Vectors]

[Immediate-Response-Preferred]

[Re-synchronization-Info]

*[AVP]

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

・The description hatched with gray is unsupported.

7.3.12 Requested-UTRAN- GERAN-Authentication-Info

The Requested-UTRAN-GERAN-Authentication-Info is of type Grouped. It shall contain the information related to the to authentication requests for UTRAN or GERAN.

AVP format

Requested-UTRAN-GERAN-Authentication-Info ::= <AVP header: 1409 10415>

[Number-Of-Requested-Vectors]

[Immediate-Response-Preferred]

[Re-synchronization-Info]

*[AVP]

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.13 RAT-Type

The RAT-Type AVP is of type Enumerated and is used to identify the radio access technology that is serving the UE. See 3GPP TS 29.212 [10] for the defined values.

[DOCOMO Compliance]

Compliance : Full Compliance

Comment :

- The MME sets “1004”(:E-UTRAN) in RAT-Type.

7.3.14 Number-Of-Requested-Vectors

The Number-Of-Requested-Vectors AVP is of type Unsigned32. This AVP shall contain the number of AVs the MME or SGSN is prepared to receive.

[DOCOMO Compliance]

Compliance : Full Compliance

Comment :

- The MME sets “5”.

7.3.15 Re-Synchronization-Info

The Re-Synchronization-Info AVP is of type OctetString. It shall contain the concatenation of RAND and AUTS.

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.16 Immediate-Response-Preferred

The Immediate-Response-Preferred AVP is of type Unsigned32. This optional AVP indicates by its presence that immediate response is preferred, and by its absence that immediate response is not preferred. If present, the value of this AVP is not significant.

When EUTRAN-AVs and UTRAN-AVs or GERAN-AVs are requested, presence of this AVP within the Requested-EUTRAN-Authentication-Info AVP shall indicate that EUTRAN-AVs are requested for immediate use in the MME/SGSN; presence of this AVP within the Requested-UTRAN-GERAN-Authentication-Info AVP shall indicate that UTRAN-AVs or GERAN-AVs are requested for immediate use in the MME/SGSN. It may be used by the HSS to determine the number of vectors to be obtained from the AuC and the number of vectors downloaded to the MME or SGSN.

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.17 Authentication-Info

The Authentication-Info AVP is of type Grouped. This AVP contains Authentication Vectors.

AVP format:

Authentication-Info ::= <AVP header: 1413 10415>

*[E-UTRAN-Vector]

*[UTRAN-Vector]

*[GERAN-Vector]

*[AVP]

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.
- As to the blue hatching, the number of “E-UTRAN-Vector” to be set is applicable up to “5”.

7.3.18 E-UTRAN-Vector

The E-UTRAN-Vector AVP is of type Grouped. This AVP shall contain an E-UTRAN Vector.

AVP format:

E-UTRAN-Vector ::= <AVP header: 1414 10415>

[Item-Number]

{ RAND }

{ XRES }

{ AUTN }

{ KASME }

*[AVP]

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.19 UTRAN-Vector

The UTRAN-Vector AVP is of type Grouped. This AVP shall contain an UTRAN Vector.

AVP format:

UTRAN-Vector ::= <AVP header: 1415 10415>

[Item-Number]

{ RAND }

{ XRES }

{ AUTN }

{ Confidentiality-Key }

{ Integrity-Key }

*[AVP]

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.20 GERAN-Vector

The GERAN-Vector AVP is of type Grouped. This AVP shall contain a GERAN Vector.

AVP format:

GERAN-Vector ::= <AVP header: 1416 10415>

[Item-Number]

{ RAND }

{ SRES }

{ Kc }

*[AVP]

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.21 Network-Access-Mode

The Network-Access-Mode AVP is of type Enumerated. The following values are defined:

PACKET_AND_CIRCUIT (0)

Reserved (1)

ONLY_PACKET (2)

[DOCOMO Compliance]

Compliance : Full Compliance

Comment :

- If “Network-Access-Mode” is set to “Reserved”, MME sends reject signal or releases the call.

7.3.22 HPLMN-ODB

The HPLMN-ODB AVP is of type Unsigned32 and it shall contain a bit mask indicating the HPLMN specific services of a subscriber that are barred by the operator. The meaning of the bits is HPLMN specific:

Table 7.3.22/1: HPLMN-ODB

Bit	Description
0	HPLMN specific barring type 1
1	HPLMN specific barring type 2
2	HPLMN specific barring type 3
3	HPLMN specific barring type 4

HPLMN-ODB may apply to mobile originated short messages and is therefore not applicable to the MME; See 3GPP TS 23.015 [36].

[DOCOMO Compliance]

Compliance : Not Applicable

7.3.23 Item-Number

The Item-Number AVP is of type Unsigned32. The Item Number is used to order Vectors received within one request.

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.24 Cancellation-Type

The Cancellation-Type AVP is of type Enumerated and indicates the type of cancellation. The following values are defined:

MME_UPDATE_PROCEDURE (0)

This value is used when the Cancel Location is sent to the previous MME due to a received Update Location message from a new MME.

SGSN_UPDATE_PROCEDURE (1)

This value is used when the Cancel Location is sent to the previous SGSN due to a received Update Location message from a new SGSN.

SUBSCRIPTION_WITHDRAWAL (2)

This value is used:

- when the Cancel Location is sent by the HSS to the current MME or SGSN due to withdrawal of the user's subscription by the HSS operator;
- when the Cancel VCSG Location is sent by the CSS to the current MME or SGSN due to withdrawal of the user's VPLMN CSG subscription by the CSS operator.

UPDATE_PROCEDURE_IWF (3)

This value is used by an IWF when interworking with a pre-Rel-8 HSS.

INITIAL_ATTACH_PROCEDURE (4)

This value is used when the Cancel Location is sent to the MME or SGSN due to a received Update Location message during initial attach procedure from an SGSN or MME respectively.

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.
- The MME treats only “0”, “2”, and “4”. When receiving “1” and “3”, the MME discards them.

7.3.25 DSR-Flags

The DSR-Flags AVP is of type Unsigned32 and it shall contain a bit mask. The meaning of the bits is defined in table 7.3.25/1:

Table 7.3.25/1: DSR-Flags

Bit	Name	Description
0	Regional Subscription Withdrawal	This bit, when set, indicates that Regional Subscription shall be deleted from the subscriber data.
1	Complete APN Configuration Profile Withdrawal	This bit, when set, indicates that all EPS APN configuration data for the subscriber shall be deleted from the subscriber data. This flag only applies to the S6d interface.
2	Subscribed Charging Characteristics Withdrawal	This bit, when set, indicates that the Subscribed Charging Characteristics have been deleted from the subscription data.
3	PDN subscription contexts Withdrawal	This bit, when set, indicates that the PDN subscription contexts whose identifier is included in the Context-Identifier AVP shall be deleted. (Note 1)
4	STN-SR	This bit, when set, indicates that the Session Transfer Number for SRVCC shall be deleted from the subscriber data.
5	Complete PDP context list Withdrawal	This bit, when set, indicates that all PDP contexts for the subscriber shall be deleted from the subscriber data.
6	PDP contexts Withdrawal	This bit, when set, indicates that the PDP contexts whose identifier is included in the Context-Identifier AVP shall be deleted. (Note 2)
7	Roaming Restricted due to unsupported feature	This bit, when set, indicates that the roaming restriction shall be deleted from the subscriber data in the MME or SGSN.
8	Trace Data Withdrawal	This bit, when set, indicates that the Trace Data shall be deleted from the subscriber data.
9	CSG Deleted	This bit, when set, indicates that - the “CSG-Subscription-Data from HSS” shall be deleted in the MME or SGSN when received over the S6a or S6d interface - the “CSG-Subscription-Data from CSS” shall be deleted in the MME or SGSN when received over the S7a or S7d interface.
10	APN-OI-Replacement	This bit, when set, indicates that the UE level APN-OI-Replacement shall be deleted from the subscriber data.
11	GMLC List Withdrawal	This bit, when set, indicates that the subscriber's LCS GMLC List shall be deleted from the MME or SGSN.
12	LCS Withdrawal	This bit, when set, indicates that the LCS service whose code is included in the SS-Code AVP shall be deleted from the MME or SGSN.
13	SMS Withdrawal	This bit, when set, indicates that the SMS service whose code is included in the SS-Code AVP or TS-Code AVP shall be deleted from the MME or SGSN.
14	Subscribed periodic RAU-TAU Timer Withdrawal	This bit, when set, indicates that the subscribed periodic RAU TAU Timer value shall be deleted from the subscriber data.
15	Subscribed VSRVCC Withdrawal	This bit, when set, indicates that the Subscribed VSRVCC shall be deleted from the subscriber data.
16	A-MSISDN Withdrawal	This bit, when set, indicates that the additional MSISDN, if present, shall be deleted from the subscriber data.
Note 1:	If the Complete APN Configuration Profile Withdrawal bit is set, this bit should not be set.	
Note 2:	If the Complete PDP context list Withdrawal bit is set, this bit should not be set.	
Note 3:	Bits not defined in this table shall be cleared by the sending HSS and discarded by the receiving MME or SGSN.	
Note 4:	Bits 3 and 6 are excluding alternatives and shall not both be set.	
Note 5:	When this AVP is transferred over the S7a/S7d interface, only the bit 9 (CSG Deleted) is meaningful, other bits shall be cleared.	

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

7.3.26 DSA-Flags

The DSA-Flags AVP is of type Unsigned32 and it shall contain a bit mask. The meaning of the bits is defined in table 7.3.26/1:

Table 7.3.26/1: DSA-Flags

Bit	Name	Description
0	Network Node area restricted	This bit, when set, shall indicate that the complete Network Node area (SGSN area) is restricted due to regional subscription.
Note: Bits not defined in this table shall be cleared by the sending SGSN and discarded by the receiving HSS.		

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.27 Context-Identifier

The Context-Identifier AVP is of type Unsigned32.

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.28 Void

[DOCOMO Compliance]

Compliance : Not Applicable

7.3.29 Subscriber-Status

The 3GPP Subscriber Status AVP is of type Enumerated. It shall indicate if the service is barred or granted. The following values are defined:

SERVICE_GRANTED (0)

OPERATOR_DETERMINED_BARRING (1)

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.30 Operator-Determined-Barring

The Operator-Determined-Barring AVP is of type Unsigned32 and it shall contain a bit mask indicating the services of a subscriber that are barred by the operator. The meaning of the bits is the following:

Table 7.3.30/1: Operator-Determined-Barring

Bit	Description
0	All Packet Oriented Services Barred
1	Roamer Access HPLMN-AP Barred
2	Roamer Access to VPLMN-AP Barred
3	Barring of all outgoing calls
4	Barring of all outgoing international calls
5	Barring of all outgoing international calls except those directed to the home PLMN country
6	Barring of all outgoing inter-zonal calls
7	Barring of all outgoing inter-zonal calls except those directed to the home PLMN country
8	Barring of all outgoing international calls except those directed to the home PLMN country and Barring of all outgoing inter-zonal calls

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.
- When receiving values from bit 3 to bit 8, the MME ignores all of them.

7.3.31 Access-Restriction-Data

The Access-Restriction-Data AVP is of type Unsigned32 and it shall contain a bit mask where each bit when set to 1 indicates a restriction.. The meaning of the bits is the following:

Table 7.3.31/1: Access-Restriction-Data

Bit	Description
0	UTRAN Not Allowed
1	GERAN Not Allowed
2	GAN Not Allowed
3	I-HSPA-Evolution Not Allowed
4	E-UTRAN Not Allowed
5	HO-To-Non-3GPP-Access Not Allowed
8	NR as Secondary RAT Not Allowed
NOTE: Bits not defined in this table shall be cleared by the HSS and discarded by the receiving MME/SGSN.	

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- When “UTRAN Not Allowed (bit 0)” is set, handover to UTRAN is restricted.
- When “E-UTRAN Not Allowed (bit 4)” is set, the MME performs a restriction to the relevant UEs.

- When “NR as Secondary RAT Not Allowed (bit 8)” is set, the MME performs a restriction to the relevant Ues , specifically those that are DC-capable and support NR.
- When a value of any other bit is set, the MME ignores it.

7.3.32 APN-OI-Replacement

The APN-OI-Replacement AVP is of type UTF8String. This AVP shall indicate the domain name to replace the APN OI for the non-roaming case and the home routed roaming case when constructing the APN, and the APN-FQDN upon which to perform a DNS resolution. See 3GPP TS 23.003 [3] and 3GPP TS 29.303 [38].

The contents of the APN-OI-Replacement AVP shall be formatted as a character string composed of one or more labels separated by dots (".").

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.33 All-APN-Configurations-Included-Indicator

The All-APN-Configurations-Included-Indicator AVP is of type Enumerated. The following values are defined:

All_APN_CONFIGURATIONS_INCLUDED (0)

MODIFIED/ADDED_APN_CONFIGURATIONS_INCLUDED (1)

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.34 APN-Configuration-Profile

The APN-Configuration-Profile AVP is of type Grouped. It shall contain the information related to the user's subscribed APN configurations for EPS. The Context-Identifier AVP within it shall that identify the per subscriber’s default APN configuration.

The AVP format shall conform to:

APN-Configuration-Profile ::= <AVP header: 1429 10415>

{ Context-Identifier }

{ All-APN-Configurations-Included-Indicator }

1*{APN-Configuration}

*[AVP]

The Subscription-Data AVP associated with an IMSI contains one APN-Configuration-Profile AVP.

Each APN-Configuration-Profile AVP contains one or more APN-Configuration AVPs.

Each APN-Configuration AVP describes the configuration for a single APN.

Therefore, the cardinality of the relationship between IMSI and APN is one-to-many.

[DOCOMO Compliance]

Compliance : Full Compliance

Comment :

- As to the blue hatching, the number of "APN-Configuration" to be set is applicable up to "5".

7.3.35 APN-Configuration

The APN-Configuration AVP is of type Grouped. It shall contain the information related to the user's subscribed APN configurations. The Context-Identifier in the APN-Configuration AVP shall identify that APN configuration, and it shall not have a value of zero. Furthermore, the Context-Identifier in the APN-Configuration AVP shall uniquely identify the EPS APN configuration per subscription. For a particular EPS user having multiple APN configurations, the Service-Selection AVP values shall be unique across APN-Configuration AVPs.

The AVP format shall conform to:

APN-Configuration ::= <AVP header: 1430 10415>

{ Context-Identifier }

* 2 [Served-Party-IP-Address]

{ PDN-Type }

{ Service-Selection}

[EPS-Subscribed-QoS Profile]

[VPLMN-Dynamic-Address-Allowed]

[MIP6-Agent-Info]

[Visited-Network-Identifier]

[PDN-GW-Allocation-Type]

[3GPP-Charging-Characteristics]

[AMBR]

*[Specific-APN-Info]

[APN-OI-Replacement]

[SIPTO-Permission]

[LIPA-Permission]

*[AVP]

The AMBR included in this grouped AVP shall include the AMBR associated to this specific APN configuration (APN-AMBR).

The Served-Party-IP-Address AVP may be present 0, 1 or 2 times. These AVPs shall be present if static IP address allocation is used for the UE, and they shall contain either of:

- an IPv4 address, or
- an IPv6 address/prefix, or
- both, an IPv4 address and an IPv6 address/prefix.

For the IPv6 prefix, the lower 64 bits of the address shall be set to zero.

The PDN-GW-Allocation-Type AVP applies to the MIP6-Agent-Info AVP. Therefore, it shall not be present if MIP6-Agent-Info is not present.

The APN-OI-Replacement included in this grouped AVP shall include the APN-OI-Replacement associated with this APN configuration. This APN-OI-Replacement has higher priority than UE level APN-OI-Replacement.

The Visited-Network-Identifier AVP indicates the PLMN where the PGW was allocated, in case of dynamic PGW assignment.

NOTE: If interworking with MAP is needed, the Context-Identifier will be in the range of 1 and 50.

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- As to the blue hatching, the number of “Specific-APN-Info” to be set is applicable up to “1”.
- The description hatched with gray is unsupported.

7.3.36 Service-Selection

The Service-Selection AVP is of type of UTF8String. This AVP shall contain either the APN Network Identifier (i.e. an APN without the Operator Identifier) per 3GPP TS 23.003 [3], clauses 9.1 & 9.1.1, or this AVP shall contain the wild card value per 3GPP TS 23.003 [3], clause 9.1.2, and 3GPP TS 23.008 [30], clause 2.13.6).

The contents of the Service-Selection AVP shall be formatted as a character string composed of one or more labels separated by dots ("."), or as the wild card APN, i.e., consisting of only one ASCII label, "*".

This AVP is defined in IETF RFC 5778[20].

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.37 EPS-Subscribed-QoS-Profile

The EPS-Subscribed-QoS-Profile AVP is of type Grouped. It shall contain the bearer-level QoS parameters (QoS Class Identifier and Allocation Retention Priority) associated to the default bearer for an APN (see 3GPP TS 23.401 [2], clause 4.7.3).

AVP format

EPS-Subscribed-QoS-Profile ::= <AVP header: 1431 10415>

{ QoS-Class-Identifier }

{ Allocation-Retention-Priority }

*[AVP]

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.38 VPLMN-Dynamic-Address-Allowed

The VPLMN Dynamic Address Allowed AVP is of type Enumerated. It shall indicate 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.. If this AVP is not present, this means that the UE is not allowed to use PDN GWs in the domain of the VPLMN. The following values are defined:

NOTALLOWED (0)

ALLOWED (1)

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.39 STN-SR

The STN-SR AVP is of type OctetString and shall contain the Session Transfer Number for SRVCC. See 3GPP TS 23.003 [3] for the definition of STN-SR. This AVP contains an STN-SR, in international number format as described in ITU-T Rec E.164 [41], encoded as a TBCD-string. See 3GPP TS 29.002 [24] for encoding of TBCD-strings. This AVP shall not include leading indicators for the nature of address and the numbering plan; it shall contain only the TBCD-encoded digits of the address.

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.40 Allocation-Retention-Priority

The Allocation-Retention-Priorit AVP is of typeGrouped and is defined in 3GPP TS 29.212 [10]. It shall indicate the Priority of Allocation and Retention for the corresponding APN configuration.

AVP format

Allocation-Retention-Priority ::= <AVP header: 1034 10415>

{ Priority-Level }

[Pre-emption-Capability]

[Pre-emption-Vulnerability]

If the Pre-emption-Capability AVP is not present in the Allocation-Retention-Priority AVP, the default value shall be PRE-EMPTION_CAPABILITY_DISABLED (1).

If the Pre-emption-Vulnerability AVP is not present in the Allocation-Retention-Priority AVP, the default value shall be PRE-EMPTION_VULNERABILITY_ENABLED (0).

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.41 AMBR

The AMBR AVP is of type Grouped.

It shall contain the maximum requested bandwidth for Uplink and Downlink traffic. The Max-Requested-Bandwidth-(UL/DL) AVPs shall encode the bandwidth value in bits per second, having an upper limit of 4294967295 bits per second. The Extended-Max-Requested-BW-(UL/DL) AVPs shall encode the bandwidth value in kilobits per second, having an upper limit of 4294967295 kilobits per second.

When the maximum bandwidth value to be set for UL (or DL, respectively) traffic is lower than 4294967296 bits per second, the Max-Requested-Bandwidth-UL (or -DL, respectively) AVP shall be present, and set to the requested bandwidth value in bits per second, and the Extended-Max-Requested-BW-UL (or -DL, respectively) AVP shall be absent.

When the maximum bandwidth value to be set for UL (or DL, respectively) traffic is higher than 4294967295 bits per second, the Max-Requested-Bandwidth-UL (or DL, respectively) AVP shall be present, and set to its upper limit 4294967295, and the Extended-Max-Requested-BW-UL (or -DL, respectively) shall be present, and set to the requested bandwidth value in kilobits per second.

AVP format

AMBR ::= <AVP header: 1435 10415>

{ Max-Requested-Bandwidth-UL }

{ Max-Requested-Bandwidth-DL }

[Extended-Max-Requested-BW-UL]

[Extended-Max-Requested-BW-DL]

*[AVP]

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.42 MIP-Home-Agent-Address

The MIP-Home-Agent-Address AVP is of type Address and is defined in IETF RFC 4004 [27]. This AVP shall contain either IPv4 or IPv6 address of the PDN-GW and this IP address shall be used as the PDN-GW IP address.

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.43 MIP-Home-Agent-Host

The MIP-Home-Agent-Host is of type Grouped and is defined in IETF RFC 4004 [27]. This AVP shall contain a FQDN of the PDN-GW which shall be used to resolve the PDN-GW IP address using the Domain Name Service function.

MIP-Home-Agent-Host grouped AVP is composed by Destination-Host and Destination-Realm AVPs.

Destination-Host shall contain the hostname of the PDN-GW, formatted as described in 3GPP TS 29.303 [38], clause 4.3.2.

Destination-Realm shall be formatted as:

epc.mnc<MNC>.mcc<MCC>.3gppnetwork.org

where MNC and MCC values indicate the PLMN where the PDN-GW is located.

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.44 PDN-GW-Allocation-Type

The PDN-GW-Allocation-Type AVP is of type Enumerated. It shall indicate whether the PDN GW address included in MIP6-Agent-Info has been statically allocated (i.e. provisioned in the HSS by the operator), or dynamically selected by other nodes. The following values are defined:

STATIC (0)

DYNAMIC (1)

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.45 MIP6-Agent-Info

The MIP6-Agent-InfoAVP is of type Grouped and is defined in IETF RFC 5447 [26]. This AVP shall contain the identity of the PDN-GW. This AVP is used to convey the identity of the PDN-GW between the MME/SGSN and the HSS regardless of the specific mobility protocol used (GTP or PMIPv6). The identity of PDN-GW is either an IP address transported in MIP-Home-Agent-Address or an FQDN transported in MIP-Home-Agent-Host. FQDN shall be used if known to the MME/SGSN/HSS.

AVP format

MIP6-Agent-Info ::= < AVP Header: 486 >
*2[MIP-Home-Agent-Address]
[MIP-Home-Agent-Host]
[MIP6-Home-Link-Prefix]
*[AVP]

Within the MIP6-Agent-Info AVP, if static address allocation is used, there may be either:

- an IPv4 address or an IPv6 address of the PGW contained in one MIP-Home-Agent-Address AVP;
- both IPv4 address and IPv6 address of the PGW contained in two MIP-Home-Agent-Address AVPs.

The AVP MIP6-Home-Link-Prefix is not used in S6a/S6d, but it is included here to reflect the complete IETF definition of the grouped AVP.

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

7.3.46 RAT-Frequency-Selection-Priority-ID

The RAT-Frequency-Selection-Priority-ID AVP is of type Unsigned32 and shall contain the subscribed value of Subscriber Profile ID for RAT/Frequency Priority. For details, see 3GPP TS 23.401 [2] and 3GPP TS 23.060 [12] . The coding is defined in 3GPP TS 36.413 [19]. Values shall be in the range of 1 to 256.

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.47 IDA-Flags

The IDA-Flags AVP is of type Unsigned32 and it shall contain a bit mask. The meanings of the bits are defined in table 7.3.47/1:

Table 7.3.47/1: IDA-Flags

Bit	Name	Description
0	Network Node area restricted	This bit, when set, shall indicate that the complete Network Node area (SGSN area) is restricted due to regional subscription.
Note: Bits not defined in this table shall be cleared by the sending SGSN and discarded by the receiving HSS.		

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.48 PUA-Flags

The PUA-Flags AVP is of type Unsigned32 and it shall contain a bit mask. The meanings of the bits are defined in table 7.3.48/1:

Table 7.3.48/1: PUA-Flags

bit	name	Description
0	Freeze M-TMSI	This bit, when set, shall indicate to the MME that the M-TMSI needs to be frozen, i.e. shall not be immediately re-used.
1	Freeze P-TMSI	This bit, when set, shall indicate to the SGSN that the P-TMSI needs to be frozen, i.e. shall not be immediately re-used.
Note: Bits not defined in this table shall be cleared by the sending HSS and discarded by the receiving MME or SGSN.		

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

7.3.49 NOR-Flags

The NOR-Flags AVP is of type Unsigned32 and it contains a bit mask. The meaning of the bits is defined in table 7.3.49/1:

Table 7.3.49/1: NOR-Flags

bit	name	Description
0	Single-Registration-Indication	This bit, when set, indicates that the HSS shall send Cancel Location to the SGSN. An SGSN shall not set this bit when sending NOR.
1	SGSN area restricted	This bit, when set, shall indicate that the complete SGSN area is restricted due to regional subscription.
2	Ready for SM from SGSN	This bit, when set, shall indicate that the UE is present or the UE has memory capacity available to receive one or more short messages via SGSN.
3	UE Reachable from MME	This bit, when set, shall indicate that the UE has become reachable again from MME.
4	Reserved	The use of this bit is deprecated. This bit shall be discarded by the receiving HSS.
5	UE Reachable from SGSN	This bit, when set, shall indicate that the UE has become reachable again from SGSN.
6	Ready for SM from MME	This bit, when set, shall indicate that the UE is present or the UE has memory capacity available to receive one or more short messages via MME.
7	Homogeneous Support of IMS Voice Over PS Sessions	This bit, when set, shall indicate that the Homogeneous Support of IMS Voice Over PS Sessions is updated.
9	Removal of MME Registration for SMS	This bit, when set, shall indicate that the MME requests to remove its registration for SMS.
Note:	Bits not defined in this table shall be cleared by the sending MME or SGSN and discarded by the receiving HSS.	

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

7.3.50 User-Id

The User-Id AVP shall be of type UTF8String. It shall contain the leading digits of an IMSI (i.e. MCC, MNC, leading digits of MSIN, see 3GPP TS 23.003 [3], clause 2.2) formatted as a character string. Within a HSS, a User-Id identifies a set of subscribers, each with identical leading IMSI digits.

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.51 Equipment-Status

The Equipment-Status AVP is of type Enumerated, and shall contain the status of the mobile equipment. The following values are defined:

WHITELISTED (0)

BLACKLISTED (1)

GREYLISTED (2)

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.52 Regional-Subscription-Zone-Code

The Regional-Subscription-Zone-Code AVP is of type OctetString. It shall contain a Zone Code (ZC) as defined in 3GPP TS 23.003 [3], clause 4.4. Up to 10 Zone Codes per VPLMN can be defined as part of the users's subscription data.

NOTE 1: Each zone code represents a collection of tracking area or routing areas (defined by the operator of the VPLMN) where the user is allowed, or disallowed, to roam. The determination of which areas are actually allowed, and which ones are not allowed, is done by the serving node (MME/SGSN) in an implementation-dependent manner.

NOTE 2: The description of RSZI in 3GPP TS 23.003 [3] is applicable, in the context of this specification, not only to location areas, but also to routing and tracking areas.

[DOCOMO Compliance]

Compliance : Full Compliance

Comment :

- The MME doesn’t discard “Regional-Subscription-Zone-Code” when receiving, and ignores it.

7.3.53 RAND

The RAND AVP is of type OctetString. This AVP shall contain the RAND. See 3GPP TS 33.401 [5].

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.54 XRES

The XRES AVP is of type OctetString. This AVP shall contain the XRES. See 3GPP TS 33.401 [5].

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.55 AUTN

The AUTN AVP is of type OctetString. This AVP shall contain the AUTN. See 3GPP TS 33.401 [5].

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.56 KASME

The KASME AVP is of type OctetString. This AVP shall contain the K_ASME. See 3GPP TS 33.401 [5].

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.57 Confidentiality-Key AVP

The Confidentiality-Key is of type OctetString, and shall contain the Confidentiality Key (CK).

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.58 Integrity-Key AVP

The Integrity-Key is of type OctetString, and shall contain the Integrity Key (IK).

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.59 Kc AVP

The Kc-Key is of type OctetString, and shall contain the Ciphering Key (Kc).

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.60 SRES

The SRES AVP is of type OctetString. This AVP shall contain the SRES. See 3GPP TS 33.102 [18].

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.61 Void

[DOCOMO Compliance]

Compliance : Not Applicable

7.3.62 PDN-Type

The PDN-Type AVP is of type Enumerated and indicates the address type of PDN. The following values are defined:

IPv4 (0)

This value shall be used to indicate that the PDN can be accessed only in IPv4 mode.

IPv6 (1)

This value shall be used to indicate that the PDN can be accessed only in IPv6 mode.

IPv4v6 (2)

This value shall be used to indicate that the PDN can be accessed both in IPv4 mode, in IPv6 mode, and also from UEs supporting dualstack IPv4v6.

IPv4_OR_IPv6 (3)

This value shall be used to indicate that the PDN can be accessed either in IPv4 mode, or in IPv6 mode, but not from UEs supporting dualstack IPv4v6. It should be noted that this value will never be used as a requested PDN Type from the UE, since UEs will only use one of their supported PDN Types, i.e., IPv4 only, IPv6 only or IPv4v6 (dualstack). This value is only used as part of the APN subscription context, as an authorization mechanism between HSS and MME.

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.63 Trace-Data AVP

The Trace-Data AVP is of type Grouped. This AVP shall contain the information related to trace function.

AVP format

Trace-Data ::= <AVP header: 1458 10415>

{Trace-Reference}

{Trace-Depth}

{Trace-NE-Type-List}

[Trace-Interface-List]

{Trace-Event-List}

[OMC-Id]

{Trace-Collection-Entity}

[MDT-Configuration]

*[AVP]

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.64 Trace-Reference AVP

The Trace-Reference AVP is of type OctetString. This AVP shall contain the concatenation of MCC, MNC and Trace ID, where the Trace ID is a 3 byte Octet String. See 3GPP TS 32.422 [23].

The content of this AVP shall be encoded as octet strings according to table 7.3.64/1.

See 3GPP TS 24.008 [31], clause 10.5.1.13, PLMN list, for the coding of MCC and MNC. If MNC is 2 digits long, bits 5 to 8 of octet 2 are coded as "1111".

Table 7.3.64/1: Encoding format for Trace-Reference AVP

8	7	6	5	4	3	2	1	
MCC digit 2				MCC digit 1				octet 1
MNC digit 3				MCC digit 3				octet 2
MNC digit 2				MNC digit 1				octet 3
Trace ID								octet 4 octet 5 octet 6

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.65 Void

[DOCOMO Compliance]

Compliance : Not Applicable

7.3.66 Void

[DOCOMO Compliance]

Compliance : Not Applicable

7.3.67 Trace-Depth AVP

The Trace-Depth AVP is of type Enumerated. The possible values are those defined in 3GPP TS 32.422 [23] for Trace Depth.

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.68 Trace-NE-Type-List AVP

The Trace-NE-Type-List AVP is of type OctetString. Octets are coded according to 3GPP TS 32.422 [23].

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.69 Trace-Interface-List AVP

The Trace-Interface-List AVP is of type OctetString. Octets are coded according to 3GPP TS 32.422 [23].

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.70 Trace-Event-List AVP

The Trace-Event-List AVP is of type OctetString. Octets are coded according to 3GPP TS 32.422 [23].

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.71 OMC-Id AVP

The OMC-Id AVP is of type OctetString. Octets are coded according to 3GPP TS 29.002 [24].

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.72 GPRS-Subscription-Data

The GPRS-Subscription-Data AVP is of type Grouped. It shall contain the information related to the user profile relevant for GPRS.

AVP format:

GPRS-Subscription-Data ::= <AVP header: 1467 10415>

{ Complete-Data-List-Included-Indicator }

1*50{PDP-Context}

*[AVP]

NOTE: The max number of PDP-Context AVP aligns with the value of maxNumOfPDP-Contexts as defined in 3GPP TS 29.002[24].

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.73 Complete-Data-List-Included-Indicator

The Complete-Data-List-Included-Indicator AVP is of type Enumerated. The following values are defined:

All_PDP_CONTEXTS_INCLUDED (0)

MODIFIED/ADDED_PDP CONTEXTS_INCLUDED (1)

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.74 PDP-Context

The PDP-Context AVP is of type Grouped. For a particular GPRS user having multiple PDP Context configurations, the Service-Selection AVP values may be the same for different PDP-Context AVPs.

AVP format

PDP-Context ::= <AVP header: 1469 10415>

{ Context-Identifier }

{ PDP-Type }

[PDP-Address]

{ QoS-Subscribed }

[VPLMN-Dynamic-Address-Allowed]

{ Service-Selection }

[3GPP-Charging-Characteristics]

[Ext-PDP-Type]

[Ext-PDP-Address]

[AMBR]

[APN-OI-Replacement]

[SIPTO-Permission]

[LIPA-Permission]

*[AVP]

The Ext-PDP-Address AVP may be present only if the PDP-Address AVP is present. If the Ext-PDP-Address AVP is present, then it shall not contain the same address type (IPv4 or IPv6) as the PDP-Address AVP.

The AMBR included in this grouped AVP shall include the AMBR associated to the APN included in the PDP-Context AVP (APN-AMBR).

The APN-OI-Replacement included in this grouped AVP shall include the APN-OI-Replacement associated to the APN included in the PDP-Context. This APN-OI-Replacement has higher priority than UE level APN-OI-Replacement.

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.75 PDP-Type

The PDP-Type AVP is of type OctetString. Octets are coded according to 3GPP TS 29.002 [24].

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.75A Ext-PDP-Type

The Ext-PDP-Type AVP is of type OctetString. Octets are coded according to 3GPP TS 29.002 [24] and 3GPP TS 29.060 [39] and shall contain the value of IPv4v6.

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.76 Void

[DOCOMO Compliance]

Compliance : Not Applicable

7.3.77 QoS-Subscribed

The QoS-Subscribed AVP is of type OctetString. Octets are coded according to 3GPP TS 29.002 [24] (octets of QoS-Subscribed, Ext-QoS-Subscribed, Ext2-QoS-Subscribed, Ext3-QoS-Subscribed and Ext4-QoS-Subscribed values are concatenated).

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.78 CSG-Subscription-Data

The CSG-Subscription-Data AVP is of type Grouped. This AVP shall contain the CSG-Id, and may contain the associated Visited-PLMN-Id, an associated expiration date and the APNs which are allowed to be accessed via Local IP Access from the CSG.

If the Visited-PLMN-Id is not present, the CSG-Subscription-Data corresponds to the registered PLMN (i.e. the visited PLMN) of the MME or the SGSN.

AVP format

CSG-Subscription-Data ::= <AVP header: 1436 10415>

{ CSG-Id }

[Expiration-Date]

*[Service-Selection]

[Visited-PLMN-Id]

*[AVP]

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.79 CSG-Id

The CSG-Id-Data AVP is of type Unsigned32. Values are coded according to 3GPP TS 23.003 [3]. Unused bits (least significant) shall be padded with zeros.

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.80 Expiration-Date

The Expiration-Date AVP is of type Time (see IETF RFC 3588 [4]) and contains the point in time when subscription to the CSG-Id expires.

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.81 Roaming-Restricted-Due-To-Unsupported-Feature

The Roaming-Restricted-Due-To-Unsupported-Feature AVP is of type Enumerated and indicates that roaming is restricted due to unsupported feature. The following value is defined:

Roaming-Restricted-Due-To-Unsupported-Feature (0)

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.82 Specific-APN-Info AVP

The Specific-APN-Info AVP is of type Grouped. It shall only be present in the APN configuration when the APN is a wild card APN. It shall contain 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.

The AVP format shall conform to:

Specific-APN-Info ::= <AVP header: 1472 10415>

{ Service-Selection }

{ MIP6-Agent-Info }

[Visited-Network-Identifier]

*[AVP]

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

7.3.83 Alert-Reason AVP

The Alert-Reason AVP is of type Enumerated. The following values are defined:

UE_PRESENT (0)

UE_MEMORY_AVAILABLE (1)

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.84 LCS-Info

The LCS-Info AVP is of type Grouped. This AVP shall contain the following LCS related information for a subscriber:

- list of GMLCs in the HPLMN that are permitted to issue a call/session unrelated or call/session related MT-LR location request for this UE;
- privacy exception list that is applicable only over the S6d interface;
- MO-LR list.

AVP format

LCS-Info ::= <AVP header: 1473 10415>

*[GMLC-Number]

*[LCS-PrivacyException]

*[MO-LR]

*[AVP]

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.85 GMLC-Number

The GMLC-Number AVP is of type OctetString. This AVP shall contain the ISDN number of the GMLC in international number format as described in ITU-T Rec E.164 [41] and shall be encoded as a TBCD-string. See 3GPP TS 29.002 [24] for encoding of TBCD-strings. This AVP shall not include leading indicators for the nature of address and the numbering plan; it shall contain only the TBCD-encoded digits of the address.

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.86 LCS-PrivacyException

The LCS-PrivacyException AVP is of type Grouped. This AVP shall contain the classes of LCS Client that are allowed to locate any target UE.

AVP format

LCS-PrivacyException ::= <AVP header: 1475 10415>

{ SS-Code }

{ SS-Status }

[Notification-To-UE-User]

*[External-Client]

*[PLMN-Client]

*[Service-Type]

*[AVP]

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.87 SS-Code

The SS-Code AVP is of type OctetString. Octets are coded according to 3GPP TS 29.002 [24].

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.88 SS-Status

The SS-Status AVP is of type OctetString. Octets are coded according to 3GPP TS 29.002 [24]. For details, see 3GPP TS 23.011 [29].

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.89 Notification-To-UE-User

The Privacy-Notification-UE-User AVP is of type Enumerated. The following values are defined:

NOTIFY_LOCATION_ALLOWED (0)

NOTIFYANDVERIFY_LOCATION_ALLOWED_IF_NO_RESPONSE (1)

NOTIFYANDVERIFY_LOCATION_NOT_ALLOWED_IF_NO_RESPONSE (2)

LOCATION_NOT_ALLOWED (3)

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.90 External-Client

The External-Client AVP is of type Grouped. This AVP shall contain the identities of the external clients that are allowed to locate a target UE for a MT-LR.

AVP format

External-Client ::= <AVP header: 1479 10415>

{ Client-Identity }

[GMLC-Restriction]

[Notification-To-UE-User]

*[AVP]

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.91 Client-Identity

The Client-Identity AVP is of type OctetString and it shall contain the ISDN number of the external client in international number format as described in ITU-T Rec E.164 [41] and shall be encoded as a TBCD-string. See 3GPP TS 29.002 [24] for encoding of TBCD-strings. This AVP shall not include leading indicators for the nature of address and the numbering plan; it shall contain only the TBCD-encoded digits of the address.

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.92 GMLC-Restriction

The GMLC-Restriction AVP is of type Enumerated. The following values are defined:

GMLC_LIST (0)

HOME_COUNTRY (1)

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.93 PLMN-Client

The PLMN-Client AVP is of type Enumerated. The following values are defined:

BROADCAST_SERVICE (0)

O_AND_M_HPLMN (1)

O_AND_M_VPLMN (2)

ANONYMOUS_LOCATION (3)

TARGET_UE_SUBSCRIBED_SERVICE (4)

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.94 Service-Type

The Service-Type AVP is of type Grouped. This AVP shall contain the identities of the service type of the clients that are allowed to locate a target UE for an MT-LR.

AVP format

Service-Type ::= <AVP header: 1483 10415>

{ ServiceTypeIdentity }

[GMLC-Restriction]

[Notification-To-UE-User]

*[AVP]

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.95 ServiceTypeIdentity

The ServiceTypeIdentity AVP is of type Unsigned32. For details on the values of this AVP, see 3GPP TS 29.002 [24].

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.96 MO-LR

The MO-LR AVP is of type Grouped. This AVP shall contain the classes of MO-LR for which a subscription exists for a particular UE.

AVP format

MO-LR ::= <AVP header: 1485 10415>

{ SS-Code }

{ SS-Status }

*[AVP]

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.97 Void

[DOCOMO Compliance]

Compliance : Not Applicable

7.3.98 Trace-Collection-Entity AVP

The Trace-collection-Entity AVP is of type Address and contains the IPv4 or IPv6 address of the Trace Collection Entity, as defined in 3GPP TS 32.422 [23], clause 5.9.

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.99 Teleservice-List

The Teleservice-List AVP is of type Grouped. This AVP shall contain the service codes for the short message related teleservice for a subscriber:

AVP format

Teleservice-List ::= <AVP header: 1486 10415>

1 * { TS-Code }* [AVP]

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.100 TS-Code

The TS-Code AVP is of type OctetString. Octets are coded according to 3GPP TS 29.002 [24].

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.101 Call-Barring-Info

The Call-Barring-Info AVP is of type Grouped. This AVP shall contain the service code and service status for the short message related call barring services for a subscriber:

AVP format

Call-Barring-Infor-List ::= <AVP header: 1488 10415>

1 * { SS-Code }

* [AVP]

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.102 SGSN-Number

The SGSN-Number AVP is of type OctetString and it shall contain the ISDN number of the SGSN. For further details on the definition of this AVP, see 3GPP TS 23.003[3]. This AVP contains an SGSN-Number in international number format as described in ITU-T Rec E.164 [41] and shall be encoded as a TBCD-string. See 3GPP TS 29.002 [24] for encoding of TBCD-strings. This AVP shall not include leading indicators for the nature of address and the numbering plan; it shall contain only the TBCD-encoded digits of the address.

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.103 IDR-Flags

The IDR-Flags AVP is of type Unsigned32 and it shall contain a bit mask. The meaning of the bits shall be as defined in table 7.3.103/1:

Table 7.3.103/1: IDR-Flags

bit	name	Description
0	UE Reachability Request	This bit when set shall indicate to the MME or the SGSN that the HSS is awaiting a Notification of UE Reachability.
1	T-ADS Data Request	This bit, when set, shall indicate to the MME or SGSN that the HSS requests the support status of "IMS Voice over PS Sessions", and the RAT Type and timestamp of the last radio contact with the UE.
2	EPS User State Request	This bit, when set, shall indicate to the MME or the SGSN that the HSS requests the MME or the SGSN for the current user state.
3	EPS Location Information Request	This bit, when set, shall indicate to the MME or the SGSN that the HSS requests the MME or SGSN for location information
4	Current Location Request	This bit when set shall indicate to the MME or the SGSN that the HSS requests the MME or SGSN to provide the most current location information by paging the UE if the UE is in idle mode. This bit is used only in combination with the"EPS Location Information Request" bit.
5	Local Time Zone Request	This bit when set shall indicate to the MME or the SGSN that the HSS requests the MME or SGSN to provide information on the time zone of the location in the visited network where the UE is attached.
6	Remove SMS Registration	This bit when set shall indicate to the MME that it shall consider itself unregistered for SMS.
NOTE:	Bits not defined in this table shall be cleared by the sending HSS and discarded by the receiving MME.	

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

7.3.104 ICS-Indicator

The ICS-Indicator AVP is of type Enumerated. The meaning of the values is defined in 3GPP TS 23.292 [34] and 3GPP TS 23.216 [35]. The following values are defined:

FALSE (0)

TRUE (1)

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.105 Visited-Network-Identifier

The Visited-Network-Identifier AVP contains the identity of the network where the PDN-GW was allocated, in the case of dynamic PDN-GW assignment.

The AVP shall be encoded as:

mnc<MNC>.mcc<MCC>.3gppnetwork.org

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.106 IMS-Voice-Over-PS-Sessions-Supported

The IMS-Voice-Over-PS-Sessions-Supported AVP is of type Enumerated. The following values are defined:

NOT_SUPPORTED (0)

This value indicates that "IMS Voice over PS Sessions" is not supported by the UE's most recently used TA or RA in the serving node.

SUPPORTED (1)

This value indicates that "IMS Voice over PS Sessions" is supported by the UE's most recently used TA or RA in the serving node.

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.107 Homogeneus-Support-of-IMS-Voice-Over-PS-Sessions

The Homogeneous-Support-of-IMS-Voice-Over-PS-Sessions AVP is of type Enumerated. The following values are defined:

NOT_SUPPORTED (0)

This value indicates that "IMS Voice over PS Sessions" is not supported, homogeneously, in any of the TAs or RAs associated to the serving node.

SUPPORTED (1)

This value indicates that "IMS Voice over PS Sessions" is supported, homogeneously, in all of the TAs or RAs associated to the serving node.

If this AVP is not present in the command, it indicates that there is no homogeneous support of IMS Voice Over PS Sessions on all the TA/RAs of the serving node, or that the homogeneity of this support is unkown to the serving node.

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.108 Last-UE-Activity-Time

The Last-UE-Activity-Time AVP is of type Time (see IETF RFC 3588 [4]), and contains the point of time of the last radio contact of the serving node (MME or SGSN) with the UE.

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.109 GMLC-Address

The GMLC-Address AVP is of type Address and shall contain the IPv4 or IPv6 address of the V-GMLC associated with the serving node.

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.110 EPS-User-State

The EPS-User-State AVP is of type Grouped. It shall contain the information related to the user state in the MME and/or the SGSN.

AVP format

EPS-User-State ::= <AVP header:1495 10415>

[MME-User-State]

[SGSN-User-State]

*[AVP]

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

7.3.111 EPS-Location-Information

The EPS-LocationInformation AVP is of type Grouped. It shall contain the information related to the user location relevant for EPS.

AVP format

EPS-Location-Information ::= <AVP header: 1496 10415>

[MME-Location-Information]

[SGSN-Location-Information]

*[AVP]

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

・The description hatched with gray is unsupported.

7.3.112 MME-User-State

The MME-User-State AVP is of type Grouped. It shall contain the information related to the user state in the MME.

AVP format

MME-User-State ::= <AVP header: 1497 10415>

[User-State]

*[AVP]

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.113 SGSN-User-State

The SGSN-User-State AVP is of type Grouped. It shall contain the information related to the user state in the SGSN.

AVP format

SGSN-User-State ::= <AVP header: 1498 10415>

[User-State]

*[AVP]

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.114 User-State

The User-State AVP is of type Enumerated and indicates the user state in EPS. The following values are defined:

DETACHED (0)

ATTACHED_NOT_REACHABLE_FOR_PAGING (1)

ATTACHED_REACHABLE_FOR_PAGING (2)

CONNECTED_NOT_REACHABLE_FOR_PAGING (3)

CONNECTED_REACHABLE_FOR_PAGING (4)

NETWORK_DETERMINED_NOT_REACHABLE (5)

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.115 MME-Location-Information

The MME-Location-Information AVP is of type Grouped. It shall contain the information related to the user location relevant for the MME.

AVP format

MME-Location-Information ::= <AVP header: 1600 10415>

[E-UTRAN-Cell-Global-Identity]

[Tracking-Area-Identity]

[Geographical-Information]

[Geodetic-Information]

[Current-Location-Retrieved]

[Age-Of-Location-Information]

[User-CSG-Information]

*[AVP]

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

・The description hatched with gray is unsupported.

7.3.116 SGSN-Location-Information

The SGSN-Location-Information AVP is of type Grouped. It shall contain the information related to the user location relevant for the SGSN.

AVP format

SGSN-Location-Information ::= <AVP header: 1601 10415>

[Cell-Global-Identity]

[Location-Area-Identity]

[Service-Area-Identity]

[Routing-Area-Identity]

[Geographical-Information]

[Geodetic-Information]

[Current-Location-Retrieved]

[Age-Of-Location-Information]

[User-CSG-Information]

*[AVP]

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.117 E-UTRAN-Cell-Global-Identity

The E-UTRAN-Cell-Global-Identity AVP is of type OctetString and shall contain the E-UTRAN Cell Global Identification of the user which identifies the cell the user equipment is registered, as specified in 3GPP TS 23.003 [3]. Octets are coded as described in 3GPP TS 29.002 [24].

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.118 Tracking-Area-Identity

The Tracking-Area-Identity AVP is of type OctetString and shall contain the Tracking Area Identity of the user which identifies the tracking area where the user is located, as specified in 3GPP TS 23.003 [3]. Octets are coded as described in 3GPP TS 29.002 [24].

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.119 Cell-Global-Identity

The Cell-Global-Identity AVP is of type OctetString and shall contain the Cell Global Identification of the user which identifies the cell the user equipment is registered, as specified in 3GPP TS 23.003 [3]. Octets are coded as described in 3GPP TS 29.002 [24].

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.120 Routing-Area-Identity

The Routing-Area-Identity AVP is of type OctetString and shall contain the Routing Area Identity of the user which identifies the routing area where the user is located, as specified in 3GPP TS 23.003 [3]. Octets are coded as described in 3GPP TS 29.002 [24].

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.121 Location-Area-Identity

The Location-Area-Identity AVP is of type OctetString and shall contain the Location Area Identification of the user which identifies the Location area where the user is located, as specified in 3GPP TS 23.003 [3]. Octets are coded as described in 3GPP TS 29.002 [24].

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.122 Service-Area-Identity

The Service-Area-Identity AVP is of type OctetString and shall contain the Service Area Identifier of the user where the user is located, as specified in 3GPP TS 23.003 [3]. Octets are coded as described in 3GPP TS 29.002 [24].

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.123 Geographical-Information

The Geographical-Information AVP is of type OctetString and shall contain the geographical Information of the user. For details and octet encoding, see 3GPP TS 29.002 [24].

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.124 Geodetic-Information

The Geodetic-Information AVP is of type OctetString and shall contain the Geodetic Location of the user. For details and octet encoding, see 3GPP TS 29.002 [24].

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.125 Current-Location-Retrieved

The Current-Location-Retrieved AVP is of type Enumerated. The following values are defined:

ACTIVE-LOCATION-RETRIEVAL (0)

This value is used when location information was obtained after a successful paging procedure for Active Location Retrieval.

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.126 Age-Of-Location-Information

The Age-Of-Location-Information AVP is of type Unsigned32 and shall contain the the elapsed time in minutes since the last network contact of the user equipment. For details, see 3GPP TS 29.002 [24].

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.127 Active-APN

The Active-APNs AVP is of type Grouped. It shall contain information about a dynamically established APN on a serving node, so the HSS can restore it, if it is eventually lost after a node restart.

The AVP format shall conform to:

Active-APN ::= <AVP header: 1612 10415>

{ Context-Identifier }

[Service-Selection]

[MIP6-Agent-Info]

[Visited-Network-Identifier]

*[Specific-APN-Info]

*[AVP]

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.128 Error-Diagnostic

The Error-Diagnostic AVP is of type Enumerated. The following values are defined:

- GPRS_DATA_SUBSCRIBED (0)

  This value shall be used when Experimental-Error is DIAMETER_ERROR_UNKNOWN_EPS_SUBSCRIPTION and there is GPRS Subscription Data for the user.

- NO_GPRS_DATA_SUBSCRIBED (1)

  This value shall be used when Experimental-Error is DIAMETER_ERROR_UNKNOWN_EPS_SUBSCRIPTION and there is not GPRS Subscription Data for the user.

- ODB-ALL-APN (2)

  This value shall be used when Experimental-Error is DIAMETER_ERROR_ROAMING_NOT_ALLOWED and the Operator Determined Barring indicates "All Packet Oriented Services Barred" (see clause 7.3.30).

- ODB-HPLMN-APN (3)

  This value shall be used when Experimental-Error is DIAMETER_ERROR_ROAMING_NOT_ALLOWED and the Operator Determined Barring indicates "Roamer Access HPLMN-AP Barred" (see clause 7.3.30).

- ODB-VPLMN-APN (4)

  This value shall be used when Experimental-Error is DIAMETER_ERROR_ROAMING_NOT_ALLOWED and the Operator Determined Barring indicates "Roamer Access to VPLMN-AP Barred" (see clause 7.3.30).

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.129 Ext-PDP-Address AVP

The Ext-PDP-Address AVP is of type Address and indicates an additional address of the data protocol, and it may be included when the PDP supports dual-stack (IPv4v6).

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.130 UE-SRVCC-Capability

The UE-SRVCC-Capability AVP is of type Enumerated. It shall indicate if the UE supports or does not support the SRVCC capability. The following values are defined:

UE-SRVCC-NOT-SUPPORTED (0)

UE-SRVCC-SUPPORTED (1)

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.131 MPS-Priority

The MPS-Priority AVP is of type Unsigned32 and it shall contain a bit mask. The meaning of the bits shall be as defined in table 7.3.131/1:

Table 7.3.131/1: MPS-Priority

Bit	Name	Description
0	MPS-CS-Priority	This bit, when set, indicates that the UE is subscribed to the eMLPP or 1x RTT priority service in the CS domain.
1	MPS-EPS-Priority	This bit, when set, indicates that the UE is subscribed to the MPS in the EPS domain.
Note: Bits not defined in this table shall be cleared by the sending HSS and discarded by the receiving MME or SGSN.		

NOTE: The HSS derives the information for MPS-CS-Priority from the eMLPP Subscription Data as defined in the 3GPP TS 29.002 [24] or 1x RTT priority service which is out of the scope of 3GPP.

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.132 VPLMN-LIPA-Allowed

The VPLMN-LIPA-Allowed AVP is of type Enumerated. It shall indicate whether the UE is allowed to use LIPA in the VPLMN where the UE is roaming. The following values are defined:

LIPA-NOTALLOWED (0)

This value indicates that the UE is not allowed to use LIPA in the VPLMN where the UE is roaming.

LIPA-ALLOWED (1)

This value indicates that the UE is allowed to use LIPA in the VPLMN where the UE is roaming.

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.133 LIPA-Permission

The LIPA-Permission AVP is of type Enumerated. It shall indicate whether the APN can be accessed via Local IP Access. The following values are defined:

LIPA-PROHIBITED (0)

This value indicates that this APN is prohibited to be accessed via LIPA.

LIPA-ONLY (1)

This value indicates that this APN can be accessed only via LIPA.

LIPA-CONDITIONAL (2)

This value indicates that this APN can be accessed via both non LIPA and LIPA.

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.134 Subscribed-Periodic-RAU-TAU-Timer

The Subscribed-Periodic-TAU-RAU-Timer AVP is of type Unsigned32 and it shall contain the subscribed periodic TAU/RAU timer value in seconds.

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.135 SIPTO-Permission

The SIPTO-Permission AVP is of type Enumerated. It shall indicate whether the traffic associated with this particular APN is allowed or not for SIPTO.

The following values are defined:

SIPTO_ALLOWED (0)

SIPTO_NOTALLOWED (1)

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.136 MDT-Configuration

The MDT-Configuration AVP is of type Grouped. It shall contain MDT related information as specified in 3GPP TS 32.422 [23].

The AVP format shall conform to:

MDT-Configuration ::= <AVP header: 1622 10415>

{ Job-Type }

[Area-Scope]

[List-Of-Measurements]

[Reporting-Trigger]

[Report-Interval]

[Report-Amount]

[Event-Threshold-RSRP]

[Event-Threshold-RSRQ]

[Logging-Interval]

[Logging-Duration]

*[AVP]

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.137 Job-Type

The Job-Type AVP is of type Enumerated. The possible values are those defined in 3GPP TS 32.422 [23] for Job-Type.

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.138 Area-Scope

The Area-Scope AVP is of type Grouped. See 3GPP TS 32.422 [23].

The AVP format shall conform to:

Area-Scope ::= <AVP header: 1623 10415>

*[Cell-Global-Identity]

*[E-UTRAN-Cell-Global-Identity]

*[Routing-Area-Identity]

*[Location-Area-Identity]

*[Tracking-Area-Identity]

*[AVP]

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.139 List-Of-Measurements

The List-Of-Measurements AVP is of type Unsigned32 and it shall contain a bit mask. The meaning of the bits is defined in 3GPP TS 32.422 [23]. The most significant bit is bit 8 of the first octet.

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.140 Reporting-Trigger

The Reporting-Trigger AVP is of type Unsigned32 and it shall contain a bit mask. The meaning of the bits is defined in 3GPP TS 32.422 [23]. The most significant bit is bit 8 of the first octet.

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.141 Report-Interval

The Report-Interval AVP is of type Enumerated. The possible values are those defined in 3GPP TS 32.422 [23] for Report Interval

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.142 Report-Amount

The Report-Amout AVP is of type Enumerated. The possible values are those defined in 3GPP TS 32.422 [23] for Report Amount.

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.143 Event-Threshold-RSRP

The Event-Threshold-RSRP AVP is of type Unsigned32. See 3GPP TS 32.422 for allowed values

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.144 Event-Threshold-RSRQ

The Event-Threshold-RSRQ AVP is of type Unsigned32. See 3GPP TS 32.422 for allowed values

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.145 Logging-Interval

The Logging-Interval AVP is of type Enumerated. The possible values are those defined in 3GPP TS 32.422 [23] for Logging Interval

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.146 Logging-Duration

The Logging-Duration AVP is of type Enumerated. The possible values are those defined in 3GPP TS 32.422 [23] for Logging Duration

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.147 Relay-Node-Indicator

The Relay-Node-Indicator AVP is of type Enumerated. It shall indicate whether the subscription data belongs to a Relay Node or not (see 3GPP TS 36.300 [40]). The following values are defined:

NOT_RELAY_NODE (0)

This value indicates that the subscription data does not belong to a Relay Node.

RELAY_NODE (1)

This value indicates that the subscription data belongs to a Relay Node.

The default value when this AVP is not present is NOT_RELAY_NODE (0).

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.148 MDT-User-Consent

The MDT-User-Consent AVP is of type Enumerated. It shall indicate whether the user has given his consent for MDT activation or not (see 3GPP TS 32.422 [23]). The following values are defined:

CONSENT_NOT_GIVEN (0)

CONSENT_GIVEN (1)

The default value when this AVP is not present in ULA is CONSENT_NOT_GIVEN (0). Absence of this AVP in IDR shall be interpreted as the MDT-User-Consent has not been modified.

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.149 PUR-Flags

The PUR-Flags AVP is of type Unsigned32 and it shall contain a bitmask. The meaning of the bits is defined in table 7.3.149/1:

Table 7.3.149/1: PUR-Flags

bit	name	Description
0	UE Purged in MME	This bit, when set, indicates that the combined MME/SGSN has purged the UE in the MME part of the node. This bit shall not be set by a standalone SGSN.
1	UE Purged in SGSN	This bit, when set, shall indicate that the combined MME/SGSN has purged the UE in the SGSN part of the node. This bit shall not be set by a standalone MME.
NOTE:	Bits not defined in this table shall be cleared by the sending MME or SGSN and discarded by the receiving HSS.	

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.150 Subscribed-VSRVCC

The Subscribed-VSRVCC AVP is of type Enumerated. It shall indicate that the user is subscribed to the vSRVCC. The following value is defined:

VSRVCC_SUBSCRIBED (0)

Absence of this AVP in IDR shall be interpreted as the Subscribed-VSRVCC has not been modified.

Absence of this AVP in ULA shall be interpreted as the user is not subscribed to the vSRVCC.

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.151 Equivalent-PLMN-List

The Equivalent-PLMN-List AVP is of type Grouped. This AVP shall contain the equivalent PLMN IDs of the registered PLMN (i.e. the visited PLMN) of the MME or the SGSN.

AVP format

Equivalent-PLMN-List ::= <AVP header: 1637 10415>

1*{ Visited-PLMN-Id }

*[AVP]

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.152 CLR-Flags

The CLR-Flags AVP is of type Unsigned32 and it shall contain a bit mask. The meaning of the bits shall be as defined in table 7.3.152/1:

Table 7.3.152/1: CLR-Flags

Bit	Name	Description
0	S6a/S6d-Indicator (Note 1)	This bit, when set, indicates that the CLR message is sent on the S6a interface, i.e. the message is to the MME or the MME part on the combined MME/SGSN. This bit, when cleared, indicates that the CLR message is sent on the S6d interface, i.e. the message is to the SGSN or the SGSN part on the combined MME/SGSN.
1	Reattach-Required	This bit, when set, indicates that the MME or SGSN shall request the UE to initiate an immediate re-attach procedure as described in 3GPP TS 23.401 [2] and in 3GPP TS 23.060 [12].
NOTE 1: The S6a/S6d-Indicator flag shall be used during initial attach procedure for a combined MME/SGSN. The S6a/S6d-Indicator flag may also be sent to a standalone node. NOTE 2: Bits not defined in this table shall be cleared by the sending HSS and discarded by the receiving MME or SGSN.		

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.
  - bit 0 : S6a/S6d-Indicator

7.3.153 UVR-Flags

The UVR-Flags AVP is of type Unsigned32 and it shall contain a bit mask. The meaning of the bits shall be as defined in table 7.3.154/1:

Table 7.3.154/1: UVR-Flags

Bit	Name	Description
0	Skip Subscriber Data	This bit, when set, indicates that the CSS may skip subscription data in UVA. If the CSG subscription data has changed in the CSS after the last successful update of the MME/SGSN, the CSS shall ignore this bit and send the updated CSG subscription data.
Bits not defined in this table shall be cleared by the sending MME or SGSN and discarded by the receiving CSS.		

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.154 UVA-Flags

The UVA-Flags AVP is of type Unsigned32 and it shall contain a bit mask. The meaning of the bits shall be as defined in table 7.3.156/1:

Table 7.3.156/1: UVA-Flags

Bit	Name	Description
0	Temporary Empty VPLMN CSG Subscription Data	This bit, when set, indicates that the CSS has currently no VPLMN CSG subscription data for this user but has registered the MME or SGSN, so to inform them if later changes in VPLMN CSG subscription data occur.
Bits not defined in this table shall be cleared by the sending MME or SGSN and discarded by the receiving CSS.		

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.155 VPLMN-CSG-Subscription-Data

The VPLMN-CSG-Subscription-Data AVP is of type Grouped. This AVP shall contain the CSG-Id, and optionally an associated expiration date.

AVP format

VPLMN-CSG-Subscription-Data ::= <AVP header: 1641 10415>

{ CSG-Id }

[Expiration-Date]

*[AVP]

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.156 Local-Time-Zone

The Local-Time-Zone AVP is of type Grouped and shall contain the Time Zone and the Daylight Saving Time (DST) adjustment of the location in the visited network where the UE is attached.

The AVP format shall conform to:

Local-Time-Zone ::= <AVP header: 1649 10415>

{ Time-Zone }

{ Daylight-Saving-Time }

* [AVP]

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.157 A-MSISDN

The A-MSISDN AVP is of type OctetString. See 3GPP TS 23.003 [3] for the definition of the Additional MSISDN. This AVP contains an A-MSISDN, in international number format as described in ITU-T Rec E.164 [41], encoded as a TBCD-string. See 3GPP TS 29.002 [24] for encoding of TBCD-strings. This AVP shall not include leading indicators for the nature of address and the numbering plan; it shall contain only the TBCD-encoded digits of the address.

This AVP may be present in the Subscription-Data AVP when sent within ULA.

It may also be present in the Subscription-Data AVP, sent within an IDR, if the current value in the MME or SGSN needs to be changed.

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.158 Void

[DOCOMO Compliance]

Compliance : Not Applicable

7.3.159 MME-Number-for-MT-SMS

The MME-Number-for-MT-SMS AVP is of type OctetString and it shall contain the ISDN number corresponding to the MME for MT SMS. For further details on the definition of this AVP, see 3GPP TS 23.003[3]. This AVP contains an international number with the format as described in ITU-T Rec E.164 [41] and shall be encoded as a TBCD-string. See

3GPP TS 29.002 [24] for encoding of TBCD-strings. This AVP shall not include leading indicators for the nature of address and the numbering plan; it shall contain only the TBCD-encoded digits of the address.

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.160 Void

[DOCOMO Compliance]

Compliance : Not Applicable

7.3.161 Void

[DOCOMO Compliance]

Compliance : Not Applicable

7.3.162 SMS-Register-Request

The SMS-Register-Request AVP is of type Enumerated and it shall indicate whether the MME requires to be registered for SMS (e.g. SGs interface not supported) or if the MME prefers not to be registered for SMS or if the MME has no preference. The AVP shall be included for MME supporting "SMS in MME" feature.

The following values are defined:

SMS_REGISTRATION_REQUIRED (0)

SMS_REGISTRATION_NOT_PREFERRED (1)

NO_PREFERENCE (2)

The criteria for setting these values is defined in 3GPP TS 23.272 [44].

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.163 Time-Zone

The Time-Zone AVP is of type UTF8String and shall contain the time zone of the location in the visited network where the UE is attached.

It contains the offset from UTC (Coordinated Universal Time) in units of 15 minutes, as defined in 3GPP TS 22.042 [42]. It shall be expressed as positive (i.e. with the leading plus sign [+]) if the local time is ahead of or equal to UTC of day and as negative (i.e. with the leading minus sign [-]) if it is behind UTC of day.

The value contained in the Time-Zone AVP shall take into account daylight saving time, such that when the sending entity changes from regular (winter) time to daylight saving (summer) time, there is a change to the value in the Time-Zone AVP.

The contents of the Time-Zone AVP shall be formatted as a character string with the following format:

Basic format: ±n, with "n" being the number of units of 15 minutes from UTC.

For example, if the offset is +2h=+8x15mn, the value of the Time-Zone AVP will be: "+8".

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.164 Daylight-Saving-Time

The Daylight-Saving-Time AVP is of type Enumerated and shall contain the Daylight Saving Time (in steps of 1 hour) used to adjust for summertime the time zone of the location where the UE is attached in the visited network.

The following values are defined:

NO_ADJUSTMENT (0)

PLUS_ONE_HOUR_ADJUSTMENT (1)

PLUS_TWO_HOURS_ADJUSTMENT (2)

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.165 Subscription-Data-Flags

The Subscription-Data-Flags is of type Unsigned32 and it shall contain a bit mask. The meaning of the bits shall be as defined in table 7.3.165/1:

Table 7.3.165/1: Subscription-Data-Flags

Bit	Name	Description
0	PS-And-SMS-Only-Service-Provision-Indication	This bit, when set, indicates that the subscription is for PS Only and permits CS service access only for SMS.
1	SMS-In-SGSN-Allowed-Indication	This bit, when set, indicates that SMS in SGSN for the user is allowed.
NOTE:	Bits not defined in this table shall be cleared by the sender and discarded by the recever of the command.	

[DOCOMO Compliance]

Compliance : Not Compliance

7.4 Result-Code and Experimental-Result Values

[DOCOMO Compliance]

Compliance : Not Applicable

7.4.1 General

This section defines result code values that shall be supported by all Diameter implementations that conform to this specification.

[DOCOMO Compliance]

Compliance : Full Compliance

7.4.2 Success

Result codes that fall within the Success category shall be used to inform a peer that a request has been successfully completed. The Result-Code AVP values defined in Diameter Base Protocol RFC 3588 [4] shall be applied.

[DOCOMO Compliance]

Compliance : Full Compliance

7.4.3 Permanent Failures

Errors that fall within the Permanent Failures category shall be used to inform the peer that the request has failed, and should not be attempted again. The Result-Code AVP values defined in Diameter Base Protocol RFC 3588 [4] shall be applied. When one of the result codes defined here is included in a response, it shall be inside an Experimental-Result AVP and the Result-Code AVP shall be absent.

[DOCOMO Compliance]

Compliance : Full Compliance

7.4.3.1 DIAMETER_ERROR_USER_UNKNOWN (5001)

This result code shall be sent by the HSS to indicate that the user identified by the IMSI is unknown

[DOCOMO Compliance]

Compliance : Full Compliance

7.4.3.2 DIAMETER_ERROR_UNKNOWN_EPS_SUBSCRIPTION (5420)

This result code shall be sent by the HSS to indicate that no EPS subscription is associated with the IMSI.

[DOCOMO Compliance]

Compliance : Full Compliance

7.4.3.3 DIAMETER_ERROR_RAT_NOT_ALLOWED (5421)

This result code shall be sent by the HSS to indicate the RAT type the UE is using is not allowed for the IMSI.

[DOCOMO Compliance]

Compliance : Full Compliance

7.4.3.4 DIAMETER_ERROR_ROAMING_NOT_ALLOWED (5004)

This result code shall be sent by the HSS to indicate that the subscriber is not allowed to roam within the MME or SGSN area.

[DOCOMO Compliance]

Compliance : Full Compliance

7.4.3.5 DIAMETER_ERROR_EQUIPMENT_UNKNOWN (5422)

This result code shall be sent by the EIR to indicate that the mobile equipment is not known in the EIR.

[DOCOMO Compliance]

Compliance : Not Compliance

7.4.3.6 DIAMETER_ERROR_UNKOWN_SERVING_NODE (5423)

This result code shall be sent by the HSS to indicate that a Notify command has been received from a serving node which is not registered in HSS as the node currently serving the user.

[DOCOMO Compliance]

Compliance : Not Compliance

7.4.4 Transient Failures

Result codes that fall within the transient failures category shall be used to inform a peer that the request could not be satisfied at the time it was received, but may be able to satisfy the request in the future. The Result-Code AVP values defined in Diameter Base Protocol RFC 3588 [4] shall be applied. When one of the result codes defined here is included in a response, it shall be inside an Experimental-Result AVP and the Result-Code AVP shall be absent.

[DOCOMO Compliance]

Compliance : Not Compliance

7.4.4.1 DIAMETER_AUTHENTICATION_DATA_UNAVAILABLE (4181)

This result code shall be sent by the HSS to indicate that an unexpectedly transient failure occurs. The requesting node can try the request again in the future.

[DOCOMO Compliance]

Compliance : Not Compliance

8 User identity to HSS resolution

The User identity to HSS resolution mechanism enables the MME, SGSN (for non-roaming case) or Diameter Relay/proxy agents in the home network (for roaming case) to find the identity of the HSS that holds the subscriber data for a given user identity when multiple and separately addressable HSSs have been deployed in the home network. The resolution mechanism is not required in networks that utilise a single HSS.

This User identity to HSS resolution mechanism may rely on routing capabilitites provided by Diameter and be implemented in the home operator network within dedicated Diameter Agents (Redirect Agents or Proxy Agents) responsible for determining the HSS identity based on the provided user identity. If this Diameter based implementation is selected by the Home network operator, the principles described below shall apply.

In non-roaming case, in networks where more than one independently addressable HSS are deployed in the home network, each MME and SGSN shall be configured with the address/identity of a Diameter Agent (Redirect Agent or Proxy Agent) implementing this resolution mechanism.

For support of roaming case, Diameter Relay agents and/or Diameter Proxy agents in the home network receiving the Diameter signalling from visited networks shall be configured with the address/identity of a Diameter Agent (Redirect Agent or Proxy Agent) implementing this resolution mechanism.

To get the HSS identity that holds the subscriber data for a given user identity in the home network, the Diameter request normally destined to the HSS shall be sent to a pre-configured address/identity of a Diameter agent supporting the User identity to HSS resolution mechanism.

- If this Diameter request is received by a Diameter Redirect Agent, the Diameter Redirect Agent shall determine the HSS identity based on the provided user identity and shall return a notification of redirection towards the HSS identity, in response to the Diameter request. Multiple HSS identities may be included in the response, as specified in IETF RFC 3588 [4]. In such a case, the requesting Diameter entity shall send the Diameter request to the first HSS identity in the ordered list received in the Diameter response from the Diameter Redirect Agent. If no successful response to the Diameter request is received, the requesting Diameter entity shall send a Diameter request to the next HSS identity in the ordered list. This procedure shall be repeated until a successful response from an HSS is received. After the user identity to HSS resolution, the MME or the SGSN shall store the determined HSS identity/name/Realm and shall use it in further Diameter requests to the same user identity.

- If this Diameter request is received by a Diameter Proxy Agent, the Diameter Proxy Agent shall determine the HSS identity based on the provided user identity and shall forward the Diameter request directly to the HSS. In this case, the user identity to HSS resolution decision is communicated to the MME/SGSN in the Origin-Host/Origin-Realm AVPs of the response. The MME or the SGSN may store the determined HSS identity/name/Realm and may use it in further Diameter requests to the same user identity.

In roaming case, whereas a Diameter Relay Agent is stateless, a stateful Diameter Proxy Agent in the home network may store the determined HSS identity/name/Realm and use it in further Diameter requests associated to the same user identity.

NOTE: Alternatives to the user identity to HSS resolution Diameter based implementation are outside the scope of this specification.

[DOCOMO Compliance]

Compliance : Not Applicable

Annex A (normative): MME mapping table for S6a and NAS Cause Code values

When the UE initiates Attach, Tracking Area Update or Service Request, there may be the need for the MME to communicate with the HSS via S6a to retrieve authentication data and/or subscription data. If this retrieval is rejected by the HSS, the received Diameter-Result-Code values or Experimental-Result values need to be mapped to appropriate cause codes over NAS to the UE.

This mapping shall be as shown in Table A.1.

This mapping shall be as shown in Table A.2.

Table A.1: Mapping from S6a error code to NAS Cause Code values

Reject indication received at MME over S6a	NAS Cause Code Sent to UE
DIAMETER_ERROR_USER_UNKNOWN (5001)	#8 "EPS services and non-EPS services not allowed"
DIAMETER_ERROR_UNKNOWN_EPS_SUBSCRIPTION (5420) without Error Diagnostic, or with Error Diagnostic of GPRS_DATA_SUBSCRIBED	#15 "No suitable cells in tracking area"
DIAMETER_ERROR_UNKNOWN_EPS_SUBSCRIPTION (5420) with Error Diagnostic of NO_GPRS_DATA_SUBSCRIBED	#7 "EPS services not allowed"
DIAMETER_ERROR_RAT_NOT_ALLOWED (5421)	#15 "No suitable cells in tracking area", or #13 "Roaming not allowed in this tracking area", or #12 "Tracking area not allowed" (NOTE 1)
DIAMETER_ERROR_ROAMING_NOT_ALLOWED (5004) , without Error Diagnostic (NOTE 3)	#11 "PLMN not allowed"
DIAMETER_ERROR_ROAMING_NOT_ALLOWED (5004), with Error Diagnostic of ODB_HPLMN_APN or ODB_VPLMN_APN	#14 "EPS services not allowed in this PLMN"
DIAMETER_ERROR_ROAMING_NOT_ALLOWED (5004), with Error Diagnostic of ODB_ALL_APN	#15 "No suitable cells in tracking area"
DIAMETER_AUTHORIZATION_REJECTED (5003) DIAMETER_UNABLE_TO_DELIVER (3002) DIAMETER_REALM_NOT_SERVED (3003)	#15 "No suitable cells in tracking area"
DIAMETER_UNABLE_TO_COMPLY (5012), DIAMETER_INVALID_AVP_VALUE (5004) DIAMETER_AVP_UNSUPPORTED (5001) DIAMETER_MISSING_AVP (5005) DIAMETER_RESOURCES_EXCEEDED (5006) DIAMETER_AVP_OCCURS_TOO_MANY_TIMES (5009) DIAMETER_AUTHENTICATION_DATA_UNAVAILABLE (4181) (NOTE 2)	#17 "Network failure" or #42 "Severe network failure" (NOTE 1)
NOTE 1: Any of those NAS Cause Code values may be sent to the UE, depending on operator's choice. NOTE 2: Any other permanent errors from the diameter base protocol, not listed here, should be mapped to NAS Cause Code #17 "Network failure".	

Table A.2: Mapping from detected error condition to NAS Cause Code values

Condition	NAS cause code sent to UE
The MME receives a SGsAP-LOCATION-UPDATE-REJECT message from the VLR indicating in the reject cause "IMSI unknown in HLR" or if the UE has packet only subscription. Only used in the Combined Tracking and Location Area Update procedure.	#2 "IMSI Unknown in HSS"
The MME receives in Update-Location-Answer message an indication of Roaming restricted in MME due to unsupported feature	#14 "EPS services not allowed in this PLMN"
The MME cannot service an UE generated request because CS domain is not available and SMS in MME is not supported.	#18 "CS domain not available"
The value OPERATOR_DETERMINED_BARRING is received in the Subscriber-Status AVP	#15 "No suitable cells in tracking area"
The HSS indicates that due to subscription to a "regionally restricted service" the UE is not allowed to operate in the tracking area.	#12 "Tracking area not allowed"
The CSG ID of the cell from where the UE has sent the TRACKING AREA UPDATE REQUEST message is not contained in the Allowed CSG list.	#25 "Not authorized for this CSG"
The MME detects that it cannot communicate with the HSS in the HPLMN of the subscriber. How the MME detect this is implementation specific.	#15 "No suitable cells in tracking area" #14 "EPS services not allowed in this PLMN" NOTE: Any of those NAS Cause Code values may be sent to the UE, depending on operator's choice / configuration, e.g. NAS Cause Code #14 is to be sent to the UE if the network is an LTE only network.
The MME detects by internal configuration that roaming is not allowed.	#11 "PLMN not allowed"

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

Annex B(normative): SGSN mapping table for S6d and NAS Cause Code values

When the UE initiates Attach, Routing Area Update or Service Request, there may be the need for the SGSN to communicate with the HSS via S6d to retrieve authentication data and/or subscription data. If this retrieval is rejected by the HSS, the received Diameter-Result-Code values or Experimental-Result values need to be mapped to appropriate cause codes over NAS to the UE.

NOTE: Mapping from MAP Gr error codes to NAS Cause Code values is described in the 3GPP TS 29.010 [45].

This mapping shall be as shown in Table B.1.

If the retrieval is successful, not needed (e.g. because data are already available) or not possible (e.g. because HSS is unavailable), detected error conditions need to be mapped to appropriate cause codes over NAS to the UE.

This mapping shall be as shown in Table and B.2.

Table B.1: Mapping from S6d error codes to NAS Cause Code values

Reject indication received at SGSN over S6d	NAS Cause Code sent to UE
DIAMETER_ERROR_USER_UNKNOWN (5001)	#8 "GPRS services and non-GPRS services not allowed"
DIAMETER_ERROR_UNKNOWN_EPS_SUBSCRIPTION (5420)	#7 "GPRS services not allowed"
DIAMETER_ERROR_RAT_NOT_ALLOWED (5421)	#15 "No suitable cells in location area", or #13 "Roaming not allowed in this location area", or #12 "Location area not allowed" (NOTE 1)
DIAMETER_ERROR_ROAMING_NOT_ALLOWED (5004) , without Error Diagnostic (NOTE 3)	#11 "PLMN not allowed"
DIAMETER_ERROR_ROAMING_NOT_ALLOWED (5004), with Error Diagnostic of ODB_HPLMN_APN or ODB_VPLMN_APN	#14 "GPRS services not allowed in this PLMN"
DIAMETER_ERROR_ROAMING_NOT_ALLOWED (5004), with Error Diagnostic of ODB_ALL_APN	#15 "No suitable cells in location area"
DIAMETER_AUTHORIZATION_REJECTED (5003) DIAMETER_UNABLE_TO_DELIVER (3002)	#15 "No suitable cells in location area"
DIAMETER_UNABLE_TO_COMPLY (5012), DIAMETER_INVALID_AVP_VALUE (5004) DIAMETER_AUTHENTICATION_DATA_UNAVAILABLE (4181) and no retry takes place (NOTE 2)	#17 "Network failure"
NOTE 1: Any of those NAS Cause Code values may be sent to the UE, depending on operator's choice. NOTE 2: Any other permanent errors from the diameter base protocol, not listed here, should be also mapped to NAS Cause Code #17 "Network failure".	

Table B.2: Mapping from detected error condition to NAS Cause Code values

Condition	NAS cause code to UE
The SGSN receives a BSSAP+-LOCATION-UPDATE-REJECT message from the VLR indicating in the reject cause "IMSI unknown in HLR" or if the UE has packet only subscription. Only used in the Combined Routing and Location Area Update procedure.	#2 "IMSI Unknown in HLR"

The SGSN receives in Update-Location-Answer message an indication of Roaming restricted in SGSN due to unsupported feature	#14 "GPRS services not allowed in this PLMN"
The value OPERATOR_DETERMINED_BARRING is received in the Subscriber-Status AVP	#15 "No suitable cells in routing area"
The HLR indicates that due to subscription to a "regionally restricted service" the MS is not allowed to operate in the location area.	#12 "Location area not allowed"
The CSG ID of the cell from where the UE has sent the ROUTING AREA UPDATE REQUEST message is not contained in the Allowed CSG list.	#25 "Not authorized for this CSG"
The SGSN indicates that the MS has requested "SMS-only services" and the SMS services are provided by the SGSN in the PS domain.	#28 "SMS provided via GPRS in this routing area"
The SGSN detects that it cannot communicate with the HLR in the HPLMN of the subscriber. How the SGSN detect this is implementation specific.	#15 "No suitable cells in routing area" #14 "GPRS services not allowed in this PLMN" NOTE: Any of those NAS Cause Code values may be sent to the UE, depending on operator's choice / configuration, e.g. NAS Cause Code #14 is to be sent to the UE if the network is an LTE only network.
The SGSN detects by internal configuration that roaming is not allowed.	#11 "PLMN not allowed"

[DOCOMO Compliance]

Compliance : Not Applicable

Annex C (informative): Change history

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
2008-09	CT#41	CP-080475			V2.0.0 approved in CT#41	2.0.0	8.0.0
2008-12	CT#42	CP-080691	0001	1	S6a Vendor-Specific-Application-Id AVP	8.0.0	8.1.0
		CP-080691	0002	1	RegSub feature		
		CP-080691	0005	-	Clarification on Immediate-Response-Preferred		
		CP-080691	0006	1	Correction of the Reference of Supported Features		
		CP-080691	0007	-	Definition of RAT-Frequency-Selection-Priority		
		CP-080691	0008	2	ME Identity Check		
		CP-080703	0009	2	Gr alignment		
		CP-080971	0010	3	Closed Subscriber Group		
		CP-080691	0011	-	AVP codes		
		CP-080691	0012	1	MSISDN AVP		
		CP-080691	0013	-	Result codes		
		CP-080691	0014	-	Removal of Editor's note in ULA Flag		
		CP-080691	0015	2	Duplicated AMBR AVP and Use of Called-Station-Id		
		CP-080691	0017	-	Change of AVP to carry the APN information		
		CP-080691	0018	1	Reference to 3GPP-Charging-Characteristics		
		CP-080691	0019	-	Access Restriction Data Definition		
		CP-080691	0020	-	AMBR Definition		
		CP-080691	0021	1	AVPs Encoding		
		CP-080691	0022	1	PDN-GW Delete		
		CP-080691	0023	1	Requesting Node Type Clarification		
		CP-080691	0024	-	Authn Session State AVP		
		CP-080691	0026	2	Trace Session Activation and Deactivation		
		CP-080691	0027	1	Context-Identifier in APN-Configuration-Profile		
		CP-080691	0029	-	APN-OIReplacement		
		CP-080703	0032	-	Access Restriction		
		CP-080691	0033	1	Context Identifier clarification		
		CP-080691	0034	1	APN-Configuration correction		
		CP-080691	0037	-	Removal of Supported RAT Types		
		CP-080691	0039	1	Extension of the Terminal-Information AVP for non-3GPP accesses		
		CP-080691	0040	-	Conditionality of ULA-Flags and PUA-Flags AVPs		
		CP-080691	0042	-	Wrong Description for Complete APN Configuration Profile Withdrawal		
		CP-080691	0043	-	Purge UE Detailed Behaviour		
		CP-080691	0044	1	MME/SGSN area restricted flag cleanup		
				-	TS number in cover page corrected	8.1.0	8.1.1
2009-03	CT#43	CP-090056	0048	2	Context Identifier for Update or Removal of PDN GW	8.1.1	8.2.0
		CP-090046	0049	-	Clarification of the relationship between Subscriber-Status and ODB		
		CP-090046	0051	2	Context-Identifier in APN-Configuration-Profile		
		CP-090024	0052	-	Update of the AVP Codes		
		CP-090236	0053	2	PDN GW update for Wildcard APN		
		CP-090044	0054	1	Ready for SM		
		CP-090046	0055	-	ODB for SM		
		CP-090044	0056	2	Handling LCS Subscription Data		
		CP-090046	0057	2	Charging Characteristics		
		CP-090046	0058	2	Regional-Subscription-Zone-Code AVP Correction		
		CP-090046	0059	2	Trace Depth corrections		
		CP-090046	0060	2	Delete Subscriber Data Request procedure		
		CP-090046	0063	1	Coding definition for STN-SR		
		CP-090046	0064	-	Trace Reference in DSR		
		CP-090046	0065	1	DSR-Flags		
		CP-090046	0066	2	Clarification on All-APN-Configurations-Included-Indicator		
		CP-090046	0069	-	User-Name AVP contains only the IMSI		
		CP-090046	0070	1	MIP6-Agent-Info Definition and Usage		
		CP-090046	0075	1	Allocation Retention Priority		
		CP-090046	0076	1	APN includes only the Network Identifier		
		CP-090046	0077	-	Error Codes and ABNF Corrections		
		CP-090039	0078	4	User to HSS resolution		
		CP-090046	0079	1	Introducing the Trace-Collection-Entity AVP		
		CP-090046	0081	4	Usage of Immediate-Response-Preferred AVP		
		CP-090044	0082	3	Handling SMS Subscription Data		
		CP-090046	0083	-	SCTP version		
		CP-090046	0084	-	RFC 5447 References		
2009-06	CT#44	CP-090287	0086	1	Notification of SMS over IP Non-Delivery for E-UTRAN and UE Reachability	8.2.0	8.3.0

		CP-090287	0087	1	Coding of Immediate Response Preferred AVP		
		CP-090287	0088	-	Trace Event List		
		CP-090287	0089	-	Removal of Requesting Node Type from AIR		
		CP-090287	0091	-	Regional-Subscription-Zone-Code clarification		
		CP-090287	0092	-	Clarification of PLMN encoding		
		CP-090287	0093	-	Diameter Command Codes for S6a/S6d/S13/S13'		
		CP-090287	0094	-	Update of Diameter Codes		
		CP-090287	0095	1	Formatting of APN in Service-Selection AVP		
		CP-090378	0096	3	User Data Download Indication		
		CP-090315	0097	-	Usage of Single-Registration-Indication		
		CP-090495	0098	3	ULR processing enhancement		
2009-09	CT#45	CP-090531	0100	2	Correction on APN-OI-Replacement	8.3.0	8.4.0
		Cp-090726	0101	3	GPRS subscription data over S6d		
		CP-090531	0102	1	Usage of DIAMETER_ERROR_UNKNOWN_EPS_SUBSCRIPTION		
		CP-090531	0103	6	Cancel Location for Initial Attach		
		CP-090531	0104	4	Subscriber Data Update		
		CP-090531	0105	1	Usage of Single Registration Indication		
		CP-090531	0106	2	Charging Characteristics Reference		
		CP-090531	0107	1	Alerting Reason Behaviour		
		CP-090531	0108	1	Wildcard APN		
		CP-090531	0109	-	Subscriber's NAM		
		CP-090531	0111	-	Trace ID length correction		
		CP-090531	0112	1	Subscription-Data AVP in Update Location Answer		
		CP-090531	0113	1	Default values for Allocation Retention Priority AVP		
		CP-090531	0114	-	Default APN and Wildcard APN		
		CP-090531	0115	2	Correction in behavior of DSR-Flags		
		CP-090531	0116	1	PDN Type		
		CP-090531	0118	1	Clarification on the process of skip subscriber data flag in the HSS		
		CP-090532	0119	1	Corrections on IDR ABNF and Service Type AVP		
		CP-090532	0120	1	TS-Code AVP is missing in DSR command		
		CP-090532	0123	1	Cleanup of the TS		
		CP-090532	0124	1	Format of User-Id		
		CP-090532	0125	1	GPRS Subscription Data Update		
		CP-090532	0126	2	APN-Configuration-Profile		
		CP-090532	0128	1	3GPP2-MEID AVP		
		CP-090532	0129	1	MIP6-Agent-Info AVP		
		CP-090532	0130	-	Alignment of Supported Feature concept with 29.229		
		CP-090532	0133	1	EPS Subscribed QoS		
		CP-090532	0137	1	Restruction of the TS 29.272		
		CP-090532	0138	1	Trace Depth per session		
		CP-090532	0140	-	Clarification of Unsigned32 bit flag AVPs		
		CP-090532	0141	1	Extra Regional-Subscription-Zone-Codes		
		CP-090532	0142	1	Clarification of Service-Selection AVP encoding		
		CP-090532	0143	1	User to HSS identity resolution for Diameter Proxy Agents		
		CP-090532	0144	-	RFSP coding		
2009-09	CT#45	CP-090556	0122	3	Optimization of Subscriber Data Update	8.4.0	9.0.0
		CP-090562	0131		Emergency Support in S6a		
2009-12	CT#46	CP-091030	0148	4	Clarification on Some Subscription Data List Handling in MME/SGSN	9.0.0	9.1.0
		CP-090793	0149	1	APN level APN-OI-Replacement		
		CP-090800	0150	2	ICS-Flag		
		CP-090767	0152	2	RFSP alignment in 29.272		
		CP-090801	0153	1	Notify Request for Emergency Attached UEs		
		CP-090767	0155	2	Wildcard APN		
		CP-090767	0157	1	Lifetime of Charging Characteristics after Change		
		CP-091030	0159	2	Correction on the UE initiated detach procedure		
		CP-090767	0163	2	FQDN for S6a NOR		
		CP-090767	0165	-	HPLMN-ODB AVP correction		
		CP-091032	0167		From GMLC-Address to GMLC-Number		
		CP-091030	0171	1	Static PDN GW		
		CP-091030	0177	1	Clarification on Usage of Re-Synchronization-Info AVP		
		CP-091030	0179	1	Clarification on the Number of PDP-Contexts in the GPRS-Subscription-Data AVP		
		CP-090767	0185	-	APN-Configuration-Profile usage in IDR		
		CP-091030	0187	2	IMEI encoding		
		CP-091030	0189	1	APN-Configuration Service-Selection values		
		CP-091030	0191	1	QoS attributes		
		CP-090789	0196	1	Subscription-Data clarification for UE Reachability		
		CP-091030	0198	2	Vendor Specific Application ID		
		CP-090776	0200	1	Destination Realm		
		CP-090767	0202	-	Correction to fault recovery procedure and ME identity check procedure		
		CP-090767	0204	-	Reference of 3GPP-Charging-Characteristics		

		CP-090767	0206	-	Reset procedure MME/SGSN behavior		
2010-03	CT#47	CP-100020	0181	2	Correction to Purge UE Detailed Behaviour	9.1.0	9.2.0
		CP-100020	0210		HPLMN ODB		
		CP-100048	0211	2	TADS support in S6a/S6d		
		CP-100020	0217		Cancellation-Type clarifications		
		CP-100020	0219	1	IETF References update		
		CP-100020	0221		Static PDN GW		
		CP-100046	0222	1	Addition of V-GMLC address for S6a		
		CP-100020	0223	1	Handling of UE Reachability MME Parameter		
		CP-100020	0227		Indication of PLMN ID of the selected PGW		
		CP-100040	0228		Context-Identifier in NOR		
		CP-100235	0230	5	EPS Subscriber State and Location Information Request		
		CP-100040	0233	1	Reset to Combined MME/SGSN		
		CP-100040	0234	1	NOR-Flags correction		
		CP-100040	0236	2	Indication of LCS Capabilities support over S6a/S6d		
		CP-100040	0238	1	Fix ambiguity on context id AVP		
2010-06	CT#48	CP-100264	0241	1	Service-Selection values	9.2.0	9.3.0
			0243	1	MIP6-Agent-Info		
			0245	2	Fix ambiguity on usage of the Supported-Features AVP		
			0260	1	Correction of Context-Identifier		
		CP-100277	0247	1	Dynamic information update after a Reset procedure		
			0248	1	Notify command from unknown MME		
		CP-100416	0249	4	S6a Error Codes		
		CP-100279	0258	3	URRP for SGSN		
		CP-100265	0262	3	MME mapping between Diameter error codes and NAS Cause Code values		
2010-09	CT#49	CP-100456	0268	1	Restoration of the SGSN Number in the VLR	9.3.0	9.4.0
		CP-100457	0272		QoS-Subscribed		
		CP-100457	0273		Trace-Reference AVP encoding		
		CP-100457	0284		Usage of MIP-Home-Agent-Host AVP		
		CP-100457	0285		Correction on HSS behaviour about IMEI		
		CP-100577	0275	2	NAS Cause Code values		
		CP-100463	0276		LCS Privacy Features for MME		
		CP-100443	0281	2	Correction to Delete Subscriber Data for SGSN		
		CP-100443	0283	1	Unclear Cancel-Type Setting for Single Registration and Initial Attach		
2010-09	CT#49	CP-100465	0267	1	Addition of SIPTO permissions in PS subscription data	9.4.0	10.0.0
2010-10	CT#50	CP-100689	0324	1	HSS Error Returned due to ODB	10.0.0	10.1.0
		CP-100689	0316	1	Clarification on Access Restriction Data		
		CP-100698	0297	1	Removal of Notify Messages during detach or last PDN connection deactivation via 3GPP access		
		CP-100679	0303	1	Usage of Served Party IP Address AVP inside the APN Configuration		
		CP-100679	0305	1	Usage of APN-OI-Replacement AVP		
		CP-100679	0307		AMBR clarification		
		CP-100679	0308		Store HSS Identity in MME/SGSN after successful ULA		
		CP-100679	0315	3	Fix ambiguity in the LCS related indication		
		CP-100679	0327	2	Unknown EPS Subscription		
		CP-100688	0325	1	Periodic TAU/RAU timer in HSS subscription		
		CP-100707	0313	1	Correction of Restoration flag		
		CP-100707	0319		Default APN and Wildcard APN		
		CP-100707	0322	1	Usage of PGW Allocation Type AVP		
		CP-100699	0323		Usage of STN-SR AVP		
		CP-100699	0291	3	Enhanced SRVCC		
		CP-100687	0290	4	Addition of MPS Priority in Subscription Data		
		CP-100683	0289	1	Addition of LIPA permission in Subscription Data		
		CP-100684	0288	1	SIPTO Permission for Wildcard APN		
2011-03	CT#51	CP-110087	0329	2	Minimization of Drive Tests (MDT)	10.1.0	10.2.0
		CP-110042	0330	2	Feature Flags for UE Reachability Notification and State/Location Info Retrieval		
		CP-110042	0337	3	Correction of error cause handling		
		CP-110042	0339	2	Setting of M bit AVP flag		
		CP-110042	0343	1	AMBR Correction		
		CP-110073	0332	2	Correction on PGW PLMN ID		
		CP-110088	0334	2	Relay Node Indicator		
		CP-110051	0346	1	PDP Address correction		
		CP-110051	0351	2	Ambiguity in IDR flags		
		CP-110051	0353		Homogeneous Support for IMS Voice over PS AVP missing		
2011-06	CT#52	CP-110351	0362		SGSN-Number AVP correction	10.2.0	10.3.0
		CP-110380	0357	2	MDT user consent		
		CP-110375	0363	1	Purge from Combined MME/SGSN		
2011-09	CT#53	CP-110562	0372	1	Active-APN AVP definition	10.3.0	10.4.0
		CP-110562	0374		Context-Identifier when interworking with GTPv1		

		CP-110562	0380	1	APN-AMBR for GPRS		
		CP-110565	0377		Correction on DIAMETER_AUTHORIZATION_REJECTED		
		CP-110699	0381		Correction of implementation error in TS 29.272, CR 324		
2011-09	CT#53	CP-110581	0369	2	Behaviour of HSS in abnormal case of Immediate-Response-Preferred AVP	10.4.0	11.0.0
		CP-110584	0370	3	Add vSRVCC updates to the S6a interface		
2011-12	CT#54	CP-110787	0390	1	Unknown EPS Subscription over S6d/S6a	11.0.0	11.1.0
		CP-110811	0387	2	Equivalent PLMN CSG Subscription Request		
		CP-110787	0397	1	M-bit Handling		
2012-03	CT#55	CP-120023	0409	1	GMLC-Number format	11.1.0	11.2.0
		CP-120025	0399	3	Initial Attach Indication in CLR		
		CP-120029	0406		T-ADS data request for detached UE		
		CP-120029	0410	1	Removal of Subscribed Periodic TAU/RAU timer in HSS subscription		
		CP-120037	0400		Clarification on UE-SRVCC-Capability AVP in ULR		
		CP-120037	0402		ODB clarification		
		CP-120037	0403	2	S6a location reporting		
2012-06	CT#56	CP-120240	0401	3	CSG ID and Local Time for NPLI	11.2.0	11.3.0
		CP-120413	0415	4	Ready for SM in MME		
		CP-120249	0418	1	ULR handling for combined MME/SGSN		
		CP-120249	0419		Clarification on Update of PGW ID		
2012-09	CT#57	CP-120476	0382	10	VCSG procedures over S7a/S7d	11.3.0	11.4.0
		CP-120476	0394	5	Delete CSG subscription Data over S7a /S7d		
		CP-120476	0416	4	VCSG Reset procedure over S7a/S7d		
		CP-120481	0404	5	PS additional number over S6a/S6d		
		CP-120462	0421	-	Single Registration Indication		
		CP-120462	0422	-	Zone Codes		
		CP-120462	0423	-	Clarification on Notification of UE Reachability		
		CP-120462	0428	-	CSG-Subscription-Data replacement		
		CP-120462	0430	1	Update of Homogeneous Support of IMS Over PS Sessions		
		CP-120462	0434	2	Mapping S6a and NAS cause code		
		CP-120473	0429	4	SMS in MME		
		CP-120473	0432	1	SMS in SGSN		
		CP-120480	0433	2	Local Time Zone		
2012-12	CT#58	CP-120722	0441	1	User-CSG-Information	11.4.0	11.5.0
		CP-120713	0457	1	SGSN-Number AVP		
		CP-120740	0436	1	Application ID for S7a/S7d		
		CP-120740	0443	2	Empty VCSG Subscription Data		
		CP-120742	0438	1	Notification Procedure clarification for UE with Emergency Bearer Services		
		CP-120742	0445	-	Inclusion of APN-OI Replacement in PDP Context		
		CP-120742	0450	-	Correction in the chapter of Reset-Answer (RSA) command		
		CP-120742	0452	1	UE Time Zone		
		CP-120742	0453	1	Corrections to Local Time Zone		
		CP-120742	0454	2	Clarification on IDR-Flags		
		CP-120742	0455	-	Correction of General Description of Delete Subscriber Data		
		CP-120742	0458	-	DSR-Flags		
		CP-120742	0461	1	Wrong implementation of the Daylight-Saving-Time AVP		
		CP-120736	0446	1	A-MSISDN Correction		
		CP-120732	0447	1	MME network condition to NAS cause code mapping		
		CP-120732	0448	2	SGSN network condition to NAS cause code mapping		
		CP-120732	0449	3	MME de-registration for "SMS in MME"		
		CP-120732	0451	1	Correction on Update Location Request		
		CP-120732	0459	1	Alignment of stage 3 SMS in MME with stage 2		
		CP-120741	0460	1	Use of Flag instead of Enumerated AVPs		

[DOCOMO Compliance]

Compliance : Not Applicable

技術的条件集別表15
直接協定事業者
SMSC接続用
インタフェース仕様

技術的条件集別表15－１
制御プロトコル仕様

本別表の規定内容は、3GPP TS29.338 V14.0.0 (2016-12)を参照している。
本別表では、3GPP 標準の規定に対して当社の準拠状況及び留意点を記述するとともに、当社による追記箇所を青字で記載している。

各項における[DOCOMO Compliance]において 3GPP 標準の規定に対する当社の準拠状況を示す。
- Not Applicable : 該当なし
- Full Compliance : 準拠
- Partial Compliance : 一部準拠
- Not Compliance : 非準拠

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

この技術仕様書は、3GPP によって作成された。

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

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1 presented to TSG for information;

2 presented to TSG for approval;

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以下を意味する：

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2 TSG に承認されるために提出されたもの。

3 3 以上は TSG による変更管理下で承認された文書。

y 2 番目の桁は、技術的改良、修正、更新など、内容に変更があるすべての改訂で追加される。

z 3 番目の桁は、文書に編集上の変更のみが組み込まれた場合に追加される。

[DOCOMO Compliance]

Compliance : Not Applicable

［ドコモ仕様の準拠状況］

準拠状況　：　該当なし

1 Scope

The present document defines the Diameter-based interfaces specific to SMS when they are used in conjunction with the "SMS in MME" architecture specified in 3GPP TS 23.272 [2] or for SGSN supporting EPS interfaces. It comprises:

本文書は、3GPP TS 23.272［2］で規定される「 SMS in MME 」アーキテクチャと組み合わせて使用される場合又は EPS インターフェースをサポートする SGSN 向けに、SMS に特化した Diameter ベースのインターフェースを定義する。以下で構成される：

- the Diameter application for the S6c interface between the HSS and the central SMS functions (SMS-GMSC, SMS Router) ;
- the Diameter application
  - for the SGd interface between the MME, the SMS-IWMSC, the SMS-GMSC and the SMS Router.
  - for the Gdd interface between the SGSN, the SMS-IWMSC, the SMS-GMSC and the SMS Router.

- HSS と SMS の中核機能（SMS-GMSC、SMS ルーター）間の S6c インターフェース向け Diameter アプリケーション；
- Diameter アプリケーション
  - MME、SMS-IWMSC、SMS-GMSC、及び SMS ルータ間の SGd インターフェース用。
  - SGSN、SMS-IWMSC、SMS-GMSC、及び SMS ルータ間の Gdd インターフェース用。

[DOCOMO Compliance]

Compliance　：　Not Applicable

［ドコモ仕様の準拠状況］

準拠状況　：　該当なし

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.272: "Circuit Switched (CS) fallback in Evolved Packet System (EPS); Stage 2".

[3] 3GPP TS 23.040: "Technical realization of the Short Message Service (SMS)".

[4] 3GPP TS 29.272: "Evolved Packet System (EPS); Mobility Management Entity (MME) and Serving GPRS Support Node (SGSN) related interfaces based on Diameter protocol".

[5] 3GPP TS 29.229: "Cx and Dx interfaces based on the Diameter protocol; Protocol details".

[6] IETF RFC 2234: "Augmented BNF for Syntax Specifications: ABNF".

[7] IETF RFC 3588: "Diameter Base Protocol".

[8] IETF RFC 5516: "Diameter Command Code Registration for the Third Generation Partnership Project (3GPP) Evolved Packet System (EPS)".

[9] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[10] 3GPP TS 29.173: "Location Services (LCS); Diameter-based SLh interface for Control Plane LCS".

[11] 3GPP TS 33.210: "3G security; Network Domain Security (NDS); IP network layer security ".

[12] IETF RFC 4960: "Stream Control Transport Protocol".

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

[14] 3GPP TS 29.329: "Sh Interface based on the Diameter protocol; Protocol details".

[15] 3GPP TS 29.336: "Home Subscriber Server (HSS) diameter interfaces for interworking with packet data networks and applications".

[16] 3GPP TS 23.003: "Numbering, addressing and identification".

[17] 3GPP TS 23.204: "Support of Short Message Service (SMS) over generic 3GPP Internet Protocol (IP) access; Stage 2".

[18] 3GPP TS 23.682: "Architecture enhancements to facilitate communications with packet data networks and applications".

[19] IETF RFC 7944: "Diameter Routing Message Priority".

[DOCOMO Compliance]

Compliance : Not Applicable

3 Definitions, symbols and abbreviations

[DOCOMO Compliance]

Compliance : Not Applicable

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

[DOCOMO Compliance]

Compliance : Not Applicable

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

ABNF	Augmented Backus-Naur Form
DRMP	Diameter Routing Message Priority
IANA	Internet Assigned Numbers Authority
IP-SM-GW	IP Short Message Gateway
MWD	Message Waiting Data
RP	Relay layer Protocol
RP-MTI	RP Message Type Indicator
RP-SMEA	RP SME-Address
RP-UI	RP User Information
SM RL	Short Message Relay Layer
SMS-GMSC	Gateway MSC for SMS
SMS-IWMSC	Interworking MSC for SMS
SMSMI	SMS without MSISDN in IMS

[DOCOMO Compliance]

Compliance : Not Applicable

4 General

[DOCOMO Compliance]

Compliance : Not Applicable

4.1 Introduction

The SMS in MME architecture is described in 3GPP TS 23.272 [2] and has specified the reference points S6c and SGd.

The clause 4 addresses Diameter aspects which are common to S6c, SGd and Gdd.

[DOCOMO Compliance]

Compliance : Not Applicable

4.2 Use of Diameter Base protocol

The Diameter Base Protocol as specified in IETF RFC 3588 [7] shall apply except as modified by the defined support of the methods and the defined support of the commands and AVPs, result and error codes as specified in this specification. Unless otherwise specified, the procedures (including error handling and unrecognised information handling) shall be used unmodified.

[DOCOMO Compliance]

Compliance : Full Compliance

4.3 Securing Diameter messages

For secure transport of Diameter messages, see 3GPP TS 33.210 [11].

[DOCOMO Compliance]

Compliance : Not Applicable

4.4 Accounting functionality

Accounting functionality (Accounting Session State Machine, related command codes and AVPs) shall not be used on the S6c, SGd and Gdd interfaces.

[DOCOMO Compliance]

Compliance : Not Applicable

4.5 Use of sessions

Diameter sessions shall be implicitly terminated over the S6c, SGd and Gdd interfaces. An implicitly terminated session is one for which the server does not maintain state information. The client shall not send any re-authorization or session termination requests to the server.

The Diameter base protocol includes the Auth-Session-State AVP as the mechanism for the implementation of implicitly terminated sessions.

The client (server) shall include in its requests (responses) the Auth-Session-State AVP set to the value NO_STATE_MAINTAINED (1), as described in IETF RFC 3588 [7]. As a consequence, the server shall not maintain any state information about this session and the client shall not send any session termination request. Neither the Authorization-Lifetime AVP nor the Session-Timeout AVP shall be present in requests or responses.

[DOCOMO Compliance]

Compliance : Full Compliance

4.6 Transport protocol

Diameter messages over the S6c, SGd and Gdd interfaces shall make use of SCTP as specified in IETF RFC 4960 [12] as transport protocol.

[DOCOMO Compliance]

Compliance : Full Compliance

Comment :

- SCTP is based on IETF RFC 2960 and RFC 3309.

4.7 Advertising application support

The MME, HSS, SMS-IWMSC, SMS-GMSC and SMS Router shall advertise support of the Diameter S6c Application over the S6c interface and of the Diameter SGd Application over the SGd interface by including the value of the application identifier in the Auth-Application-Id AVP within the Vendor-Specific-Application-Id grouped AVP of the Capabilities-Exchange-Request and Capabilities-Exchange-Answer commands. The MME, SMS-GMSC and SMS Router shall additionally advertise support of the Diameter S6c Application over the SGd interface if they support the Alert Service Centre procedure between the MME, SMS-GMSC and SMS Router.

The SGSN, SMS-IWMSC, SMS-GMSC and SMS Router shall advertise support of the Diameter SGd Application over the Gdd interface by including the value of the application identifier in the Auth-Application-Id AVP within the Vendor-Specific-Application-Id grouped AVP of the Capabilities-Exchange-Request and Capabilities-Exchange-Answer commands. The SGSN, SMS-GMSC and SMS Router shall additionally advertise support of the Diameter S6c Application over the Gdd interface if they support the Alert Service Centre procedure between the SGSN, SMS-GMSC and SMS Router.

The MTC-IWF and SMS-IWMSC shall advertise support of the Diameter SGd Application over the T4 interface if they support the MO-Forward-Short-Message procedure between the SMS-IWMSC and the MTC-IWF.

The vendor identifier value of 3GPP (10415) shall be included in the Supported-Vendor-Id AVP of the Capabilities-Exchange-Request and Capabilities-Exchange-Answer commands, and in the Vendor-Id AVP within the Vendor-Specific-Application-Id grouped AVP of the Capabilities-Exchange-Request and Capabilities-Exchange-Answer commands.

The Vendor-Id AVP included in Capabilities-Exchange-Request and Capabilities-Exchange-Answer commands that is not included in the Vendor-Specific-Application-Id AVPs as described above shall indicate the manufacturer of the Diameter node as per IETF RFC 3588 [7].

[DOCOMO Compliance]

Compliance : Full Compliance

4.8 Diameter Application Identifier

The S6c and the SGd/Gdd interface protocols shall be defined, each, as an IETF vendor specific Diameter application, where the vendor is 3GPP. The vendor identifier assigned by IANA to 3GPP (http://www.iana.org/assignments/enterprise-numbers) is 10415.

The Diameter application identifier assigned to the S6c Diameter application is 16777312 (allocated by IANA).

The Diameter application identifier assigned to the SGd Diameter application, which is also applicable to the Gdd and T4 interfaces is 16777313 (allocated by IANA).

[DOCOMO Compliance]

Compliance : Full Compliance

4.9 Use of the Supported-Features AVP

When new functionality is introduced on the S6c or SGd Diameter applications, it should be defined as optional. If backwards incompatible changes can not be avoided, the new functionality shall be introduced as a new feature and support advertised with the Supported-Features AVP. The usage of the Supported-Features AVP on the S6c or SGd applications is consistent with the procedures for the dynamic discovery of supported features as defined in clause 7.2 of 3GPP TS 29.229 [5].

When extending the application by adding new AVPs for a feature, the new AVPs shall have the M bit cleared and the AVP shall not be defined mandatory in the command ABNF.

As defined in 3GPP TS 29.229 [5], the Supported-Features AVP is of type grouped and contains the Vendor-Id, Feature-List-ID and Feature-List AVPs. On the all reference points as specified in this specification, the Supported-Features AVP is used to identify features that have been defined by 3GPP and hence, for features defined in this document, the Vendor-Id AVP shall contain the vendor ID of 3GPP (10415). If there are multiple feature lists defined for the reference point, the Feature-List-ID AVP shall differentiate those lists from one another.

[DOCOMO Compliance]

Compliance : Not Applicable

5 Diameter based S6c interface between HSS and central SMS functions

[DOCOMO Compliance]

Compliance : Not Applicable

5.1 Introduction

The S6c interface enables the retrieval of routing information for the transfer of short messages, the report of status of the delivery status of a short message and the alerting of the SMS-SC between the HSS, the SMS-GMSC and the SMS Router as described in 3GPP TS 23.040 [3].

[DOCOMO Compliance]

Compliance : Not Applicable

5.2 Procedures description

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.1 Send Routing Info for SM procedure

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.1.1 General

This procedure shall be used between the SMS-GMSC or the IP-SM-GW and the HSS to retrieve the routing information needed for routing the short message to the serving MSC or MME or SGSN. This procedure is also used between the SMS-GMSC and the SMS Router or the IP-SM-GW, and between the HSS and the SMS Router or the IP-SM-GW in order to enforce routing of the SM delivery via the HPLMN of the receiving MS.

This procedure is applicable to an IP-SM-GW for its SMS Router function when using the S6c interface.

This procedure is used according to the call flows described in 3GPP TS 23.040 [2] clause 10.

Table 5.2.1.1-1 specifies the involved information elements for the request.

Table 5.2.1.1-2 specifies the involved information elements for the answer.

This procedure is mapped to the commands Send-Routing-Info-for-SM-Request/Answer (SRR/SRA) in the Diameter application specified in subclause 5.3.2.

Table 5.2.1.1-1: Send Routing Info for SM Request

Information element name	Mapping to Diameter AVP	Cat.	Description
MSISDN	MSISDN	C	This information element shall be present when the MSISDN exists and shall contain the MSISDN of the user.
IMSI	User-Name (See IETF RFC 3588 [6])	C	This information element shall be present when the MSISDN does not exist and shall contain - the IMSI of the user in the context of T4 device triggering (see 3GPP TS 23.682 [18]; - or the HSS ID value in the context of MSISDN-less SMS delivery in IMS (see 3GPP TS 23.204 [17]),.
SMSMI Correlation ID	SMSMI-Correlation-ID	C	This information element indicates by its presence that the request is sent in the context of MSISDN-less SMS delivery in IMS (see 3GPP TS 23.204 [17]). This information element shall contain the SIP-URI of the (MSISDN-less) destination user. The SIP-URI of the originating user and the HSS-ID shall be absent from this information element.
Service Centre Address	SC-Address	M	This information element shall contain the Service Centre address.
SM-RP-MTI	SM-RP-MTI	C	This information element shall contain the RP-Message Type Indicator of the Short Message. It is used to distinguish a SM sent to the mobile station in order to acknowledge an MO-SM initiated by the mobile from a normal MT-SM.
SM-RP-SMEA	SM-RP-SMEA	C	This information element shall contain the RP-Originating SME-address of the Short Message Entity that has originated the SM. This information element shall be present if the SMS-GMSC supports receiving of the two numbers from the HSS. Used by the short message service relay sub-layer protocol it shall be formatted according to the formatting rules of address fields as described in 3GPP TS 23 040 [2].
SRR Flags	SRR-Flags	C	This Information Element contains a bit mask. See 5.3.3.4 for the meaning of the bits and the condition for each bit to be set or not.
SM-Delivery Not Intended	SM-Delivery Not Intended	O	This information element, when present, shall indicate that delivery of a short message is not intended. It further indicates whether only IMSI or only MCC+MNC are requested. This information element may be set by entities that request the service without intending to deliver a short message, and shall be evaluated by the SMS Router and may be evaluated by the HSS.
Supported Features	Supported-Features (See 3GPP TS 29.229 [5])	O	If present, this Information Element shall contain the list of features supported by the origin host.

Table 5.2.1.1-2: Send Routing Info for SM Answer

Information element name	Mapping to Diameter AVP	Cat.	Description
Result	Result-Code / Experimental-Result	M	Result of the request. Result-Code AVP shall be used for errors defined in the Diameter Base Protocol. Experimental-Result AVP shall be used for S6c errors. This is a grouped AVP which contains the 3GPP Vendor ID in the Vendor-Id AVP, and the error code in the Experimental-Result-Code AVP. This information element shall contain the result of the operation with an indication of the success / errors. The following errors are applicable in this case: - Unknown User; - Service Barred; - Teleservice Not Provisioned; - Absent User; - Facility Not Supported.
IMSI	User-Name (See IETF RFC 3588 [6])	C	This information element: - either shall contain the IMSI of the user. - or, if enforcement of routing an SM via the HPLMN of the receiving MS or UE is deployed, shall contain an MT Correlation ID instead of an IMSI when the service is used between SMS-GMSC and SMS Router (see 3GPP TS 23.040 [3] for more information). - or, if the "SM-Delivery Not Intended" Information Element was present in the request with a value of "only MCC+MNC requested", may contain MCC+MNC+dummy MSIN. This information element shall be present in a successful answer. This information element shall be present in an answer from the HSS to the IP-SM-GW, if an Absent User result is returned and the UNRI is not set.
Serving-Node	Serving-Node	C	If the "SM-Delivery Not Intended" Information Element was not present in the request, this information element shall contain the identity of one serving node on which the user is registered. This identity shall either be: - the Diameter identity and the Diameter realm of the MME registered for MT SMS plus the E164 number of the MME for MT SMS; - or the ISDN number of the MSC; - or the Diameter identity and the Diameter realm of the SGSN, if they are available, and the ISDN number of the SGSN, - or the Diameter identity and the Diameter realm of the IP-SM-GW, if they are available, and the ISDN number of the IP-SM-GW. If the "SM-Delivery Not Intended" Information Element was present in the request, this information element may be absent. This information element shall be present in a successful answer.
LMSI	LMSI	C	The HSS shall include the LMSI in a successful response, if the VLR has used the LMSI and if there is the ISDN number of an MSC in the answer.
Additional Serving Node	Additional-Serving-Node	C	This information element, when present shall either contain: - the Diameter identity and the Diameter realm of the MME registered for MT SMS plus the E164 number of the MME for MT SMS. - or the ISDN number of the MSC - or the Diameter identity and the Diameter realm of the SGSN, if they are available, and the ISDN number of the SGSN. It shall not contain information delivered in the Serving Node information element.
User Identifier Alert	User-Identifier	C	This information element shall contain the MSISDN stored in the HSS, when available.
MWD Status	MWD-Status	C	This Information Element is sent when appropriate and shall contain a bit mask. See 5.3.3.8 for the meaning of the bits.
MME Absent User Diagnostic SM	MME-Absent-User-Diagnostic-SM	C	This information element shall contain the reason of the absence of the user when given by the MME and stored in the HSS

MSC Absent User Diagnostic SM	MSC-Absent-User-Diagnostic-SM	C	This information element shall contain the reason of the absence of the user when given by the MSC and stored in the HSS
SGSN Absent User Diagnostic SM	SGSN-Absent-User-Diagnostic-SM	C	This information element shall contain the reason of the absence of the user when given by the SGSN and stored in the HSS
Supported Features	Supported-Features (See 3GPP TS 29.229 [5])	O	If present, this information element shall contain the list of features supported by the origin host.

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.1.2 Detailed behaviour of the SMS-GMSC

The SMS-GMSC shall make use of this procedure to retrieve the routing information needed for routing the short message to the serving MSC or MME or SGSN or for enforcing routing of the SM delivery via the SMS Router of HPLMN.

It shall populate the information elements in the Send Routing Info for SM request according to the table 5.2.1.1-1.

When the Send Routing Info for SM Request is sent by the SMS-GMSC to the HSS in a retry context of SMS for IMS UE to IMS UE without MSISDN (see 3GPP TS 23.204 [17]), IMSI may not be available. In this case the IMSI information element shall be populated with the HSS-ID value.

When receiving the Send Routing Info for-SM Answer, the SMS-GMSC or the SMS Router shall use the received Diameter address if the SMS-GMSC or the SMS Router transfers the terminating short message over the SGd or the Gdd interface.

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.1.3 Detailed behaviour of the HSS

This subclause describes the HSS behaviour when the HSS receives a Send Routing Info for SM request which is not forwarded to an SMS Router or an IP-SM-GW.

The HSS shall check if the user identified by the MSISDN is known; otherwise, the HSS shall return an Experimental-Result-Code set to DIAMETER_ERROR_USER_UNKNOWN.

The HSS shall check if a MT SMS Teleservice subscription exists; otherwise, the HSS shall return an Experimental-Result-Code set to DIAMETER_ERROR_SERVICE_NOT_SUBSCRIBED.

The HSS shall check if the user is not barred for receiving MT short messages; otherwise, the HSS shall return an Experimental-Result-Code set to DIAMETER_ SERVICE _ERROR_BARRED.

The HSS shall check if one or more serving nodes are registered for MT SMS; otherwise, the HSS shall return an Experimental-Result-Code set to DIAMETER_ERROR_ABSENT_USER. If there is no serving node being registered for MT SMS and the Single-Attempt-Delivery flag in SRR-Flags AVP is set, the HSS shall not add the SC address into the MWD list.

The HSS shall then return a Send Routing Info for SM answer with a Result-Code set to DIAMETER_SUCCESSFUL that shall contain the addresses of the serving nodes that are registered for MT SMS according the following rules:

- if the GPRS indicator is not set, only one serving node address shall be returned according to the SM transfer option where MME is considered as a MSC. The address of the MME, if returned, shall comprise the MME Diameter address and the MME Number for MT SMS.
- if the GPRS indicator is set, two serving node addresses shall be returned of which
  - the Diameter address of the SGSN if available and the SGSN number,
  - either the number of the MSC or the Diameter address and the number of the MME for MT SMS.
- when two serving g nodes addresses are returned, the HSS selects which serving node it will populate in the Serving Node information element and in the Additional Serving Node information elements.

NOTE: MSC and MME cannot be both registered as serving nodes for MT SMS at a given time (cf 3GPP TS 23.272 [2])

If the stored MSISDN number is not the same as the one received in the Send Routing Info for SM request service, the stored MSISDN number shall be included in the message.

In the context of MSISDN-less SMS delivery in IMS (see 3GPP TS 23.204 [17]), if the HSS receives an SMSMI correlation ID, the HSS shall return the IP-SM-GW number and shall not forward the request to an IP-SM-GW.

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.1.4 Detailed behaviour of the SMS Router

When receiving a Send Routing Info for SM request, the SMS Router shall:

- send a Send Routing Info for SM request to the HSS to retrieve the routing information needed for routing the short message to the serving MSC or MME or SGSN;
- if the Send Routing Info for SM answer received from HSS is successful, the SMS Router shall send a Send Routing Info for SM answer to the SMS-GMSC where
  - the SMS router shall populate the same Serving Node and Additional Serving Node fields (i.e AVPs) as the ones it received in the Send Routing Info for SM answer from HSS, but with its own SMS Router number and its own SMS Router Diameter address;
- if the Send Routing Info for SM answer received from HSS is not successful, the SMS Router shall send a Send Routing Info for SM answer to the SMS-GMSC with the same Diameter error result code.

If the SMS Router receives some of the following information elements, User Identifier Alert, MWD Status, MSC Absent User Diagnostic SM, MME Absent User Diagnostic SM, SGSN Absent User Diagnostic SM, it shall transfer them in the Send-Routing Info for SM answer to the SMS-GMSC.

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.2 Alert Service Centre procedure

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.2.1 General

This procedure shall be used between the HSS and the SMS-IWMSC to indicate that the MS is now recognized by the PLMN to have recovered its operation to allow for an MT SMS delivery. This procedure is used according to the call flows described in 3GPP TS 23.040 [2] clause 10.

Table 5.2.2.1-1 specifies the involved information elements for the request.

Table 5.2.2.1-2 specifies the involved information elements for the answer.

This procedure is mapped to the commands Alert-Service-Centre-Request/Answer (ALR/ALA) in the Diameter application specified in subclause 5.3.2.

Table 5.2.2.1-1: Alert Service Centre Request

Information element name	Mapping to Diameter AVP	Cat.	Description
Service Centre Address	SC-Address	M	This information element shall contain the Service Centre address received from the mobile station.
User Identifier Alert	User-Identifier	M	This information element shall contain: - either the Alert MSISDN when it exists; - or the IMSI in the context of T4 device triggering (see 3GPP TS 23.682 [18] if MSISDN is not available; - or a dummy MSISDN value (see clause 3 of 3GPP TS 23.003 [16]) if no MSISDN in a retry context of SMS for IMS UE to IMS UE without MSISDN (see 3GPP TS 23.204 [17]).
SMSMI Correlation ID	SMSMI-Correlation-ID	C	This information shall contain the SIP-URI of the destination user which is stored in the Message Waiting Data list in a retry context of SMS for IMS UE to IMS UE without MSISDN (see 3GPP TS 23.204 [17]). The HSS-ID and the Originating SIP-URI shall be absent.
Maximum UE Availability Time	Maximum-UE-Availability-Time	C	This information element shall be included, if available. When present, it shall indicate the timestamp (in UTC) until which a UE using a power saving mechanism (such as extended idle mode DRX) is expected to be reachable for SM Delivery. This information may be used by the SMS Center to prioritize the retransmission of Short Message to UEs using a power saving mechanism.
Supported Features	Supported-Features (See 3GPP TS 29.229 [5])	O	If present, this information element shall contain the list of features supported by the origin host.

Table 5.2.2.1-2: Alert Service Centre Answer

Information element name	Mapping to Diameter AVP	Cat.	Description
Result	Result-Code / Experimental-Result	M	This information element shall contain the result of the request. The Result-Code AVP shall be used for errors defined in the Diameter Base Protocol. The Experimental-Result AVP shall be used for S6c errors. This is a grouped AVP which contains the 3GPP Vendor ID in the Vendor-Id AVP, and the error code in the Experimental-Result-Code AVP. This information element shall contain the result of the operation with an indication of the success / errors. No errors are defined for this case.
Supported Features	Supported-Features (See 3GPP TS 29.229 [5])	O	If present, this information element shall contain the list of features supported by the origin host.

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.2.2 Detailed behaviour of the HSS

The HSS shall make use of this procedure to alert the service centre when the mobile user is active after a short message transfer has failed because the mobile user is not reachable, or when the UE has indicated that it has memory capacity to accept a short message.

It is an operator option to resend an Alert Service Centre request to the SMS-IWMSC if the alert is unsuccessful. The number of repeat attempts and the interval between them is also an operator option. The service centre address should be purged from the MWD list if the alert is consistently unsuccessful.

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.2.3 Detailed behaviour of the SMS-IWMSC

When receiving an Alert Service Centre request the SMS-IWMSC shall check whether the service centre address is known. If the service centre address is not valid, then no further action shall be taken.

If the service centre address is valid, the SMS-IW-MSC generates an Alert Service Centre message towards the SMS Centre.

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.3 Report SM Delivery Status procedure

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.3.1 General

This procedure shall be used between the SMS-GMSC or the IP-SM-GW and the HSS to update the Message Waiting Data in the HSS or to inform the HSS of a successful SM transfer after polling. This procedure is invoked by the SMS-GMSC or the IP-SM-GW.

This procedure is applicable to an IP-SM-GW for its SMS Router function when using the S6c interface.

This procedure is used according to the call flows described in 3GPP TS 23.040 [2] clause 10.

Table 5.2.3.1-1 specifies the involved information elements for the request.

Table 5.2.3.1-2 specifies the involved information elements for the answer.

This procedure is mapped to the commands Report-SM-Delivery-Status-Request/Answer (RDR/RDA) in the Diameter application specified in subclause 5.3.2.

Table 5.2.3.1-1: Report SM Delivery Status Request

Information element name	Mapping to Diameter AVP	Cat.	Description
User Identifier	User-Identifier	M	This information element shall contain: - the MSISDN of the user when it exists. - or the IMSI of the UE if MSISDN is not available in the context of a SM delivery status report following a T4 Submit Trigger (see 3GPP TS 23.682 [18] . - or the value of the HSS ID within the User-Name AVP in a retry context of SMS for IMS UE to IMS UE without MSISDN (see 3GPP TS 23.204 [17]),
SMSMI-Correlation ID	SMSMI-Correlation-ID	C	In a retry context of SMS for IMS UE to IMS UE without MSISDN (see 3GPP TS 23.204 [17]), this information element shall contain the SIP-URI of the (MSISDN-less) destination user. The originating SIP-URI and the HSS-ID shall be absent from this information element.
Service Centre Address	SC-Address	M	This information element shall contain the Service Centre address.
SM Delivery Outcome	SM-Delivery-Outcome	M	This information element shall contain the causes for setting the message waiting data in the HSS according to the network node(s) used for the SM delivery: - MSC - MME - SGSN - IP-SM-GW. At least one cause shall be present. A cause originated from a MSC and a cause originated from a MME shall not be both present. When the cause is Absent User, the Absent User Diagnostic, if available, shall be associated to the cause.
RDR Flags	RDR-Flags	O	This Information Element contains a bit mask. See 5.3.3.x for the meaning of the bits and the condition for each bit to be set or not.
Supported Features	Supported-Features (See 3GPP TS 29.229 [5])	O	If present, this Information Element shall contain the list of features supported by the origin host.

Table 5.2.3.1-2: Report SM Delivery Status Answer

Information element name	Mapping to Diameter AVP	Cat.	Description
Result	Result-Code / Experimental-Result	M	This information element shall contain the Result of the request. The Result-Code AVP shall be used for errors defined in the Diameter Base Protocol. The Experimental-Result AVP shall be used for S6c errors. This is a grouped AVP which contains the 3GPP Vendor ID in the Vendor-Id AVP, and the error code in the Experimental-Result-Code AVP. This information element shall contain the result of the operation with an indication of the success / errors. The following errors are applicable: - Unknown User; - Message Waiting List Full.
MSISDN-Alert	User-Identifier	C	This information element shall contain the Alert MSISDN of the user if it is different from the MSISDN received in the request.
Supported Features	Supported-Features (See 3GPP TS 29.229 [5])	O	If present, this information element shall contain the list of features supported by the origin host.

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.3.2 Detailed behaviour of the SMS-GMSC

The SMS-GMSC shall make use of this procedure if:

- the reason received from the serving node for failure to deliver the message is absent user, unidentified user or SM delivery failure with error cause "UE memory capacity exceeded", and the SC address is not yet included in the MWD set, and the serving node did not request the SMS-GMSC to retransmit the Short Message at a later requested retransmission time, or
- the reason received from the serving node for failure to deliver the message is absent user, unidentified user or SM delivery failure with error cause "UE memory capacity exceeded", and the corresponding flag in the HSS (as indicated in the information received from HSS) is not set, or
- the reason received from the serving node (MSC/MME or SGSN) for failure to deliver the message is absent user and the absent user diagnostic is different from the absent user diagnostic received from the HSS.

If absent user diagnostic information (see 3GPP TS 23.040 [3]) is received with the absent user error indication then the SMS-GMSC shall relay this information to the HSS.

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.3.3 Detailed behaviour of IP-SM-GW

The IP-SM-GW shall make use of this procedure if:

- the reason for failure to deliver the message is absent user, unidentified user or SM delivery failure with error cause "UE memory capacity exceeded", and the SC address is not yet included in the MWD set, or

- the reason for failure to deliver the message is absent user, unidentified user or SM delivery failure with error cause "UE memory capacity exceeded", and the corresponding flag in the HSS (as indicated in the information received in the MAP_INFORM_SERVICE_CENTRE) is not set, or
- the reason for failure to deliver the message is absent user and the absent user diagnostic is different from the absent user diagnostic received from the HSS.

[DOCOMO Compliance]

Compliance : Not Applicable

5.2.3.4 Detailed behaviour of the HSS

When receiving a Report SM Delivery Status request the HSS shall check if the user is known.

If the user is not known, the HSS shall return an Experimental-Result-Code set to DIAMETER_ERROR_USER_UNKNOWN.

If it is known, the HSS shall update the Message Waiting data as described in 3GPP TS 23.040 [3]. If the Single-Attempt-Delivery flag in RDR-Flags AVP is set, the HSS shall not add the SC address into the MWD list.

If the message waiting data is full, the HSS shall return an Experimental-Result-Code set to DIAMETER_ERROR_MWD_LIST_FULL.

If the received MSISDN is different from the stored MSISDN, the HSS shall return the Alert MSISDN.

[DOCOMO Compliance]

Compliance : Not Applicable

5.3 Protocol specification

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.1 Routing considerations

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.1.1 Requests from the SMS-GMSC or the SMS router

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.1.1.1 Introduction

The subclauses in 5.3.1.1 specify the use of the Diameter routing AVPs Destination-Realm and Destination-Host over the S6c interface for Diameter command requests from the SMS-GMSC or the SMS router or the IP-SM-GW (i.e. for the Send Routing Info for SM and the Report SM Delivery Status procedures) The subclause 5.3.1.1 also applies for the Report SM Delivery Status request generated by a SMS-SC in a retry context of SMS for IMS UE to IMS UE without MSISDN (see 3GPP TS 23.204 [17]) .

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.1.1.2 Routing from the originating PLMN

If the SMS-GMSC or the SMS router has stored or can obtain the address/name and the home network domain name of the HSS identified by the MSISDN or the IMSI, both the Destination-Realm and Destination-Host AVPs shall be present in the request.

The SMS Router shall use the MCC/MNC values of the PLMN to which it belongs, to build the MCC/MNC based network domain as described in subclause 19.2 of 3GPP TS 23.003 [16] and include it in the Destination-Realm AVP of the request. The request shall then be routed to the next Diameter node.

If the SMS-GMSC can only obtain the MCC/MNC values from the MSISDN or the IMSI, the SMS-GMSC shall use them to build the MCC/MNC based network domain as described in subclause 19.2 of 3GPP TS 23.003 [16] and include it in the Destination-Realm AVP of the request. The request shall then be routed to the next Diameter node.

If the SMS-GMSC cannot obtain the MCC/MNC values from the MSISDN of the user, the SMS-GMSC may forward the request to a Diameter node within the same PLMN, the Destination Realm content being left to the PLMN operator choice. Then:

- if a Diameter node in the routing path insides the PLMN of the SMS-GSMC can obtain the MCC/MNC values of the PLMN to which the user is subscribed to (i.e. when the number portability is resolved in the network of the SMS-GMSC), or
- if, otherwise, the Diameter node can obtain the MCC/MNC values of the PLMN associated to the CC and NDC codes of the MSISDN of the user, then
- the Diameter node shall use them to build the MCC/MNC based network domain as described in subclause 19.2 of 3GPP TS 23.003 [16] and include it in the Destination-Realm AVP of the request. The request shall then be routed to the next Diameter node.

If the MCC/MNC values of the PLMN associated to the CC and NDC codes of the MSISDN or the MCC/MNC values of the PLMN to which the user is subscribed to cannot be obtained in the PLMN of the SMS-GMSC, the request shall be replaced in the PLMN of the SMS-GMSC by an equivalent request routed through a MAP interface (e.g. via an IWF).

NOTE 1: The inter PLMN routing principle is to reuse the routing based on a MCC/MNC based domain name as used by other Diameter applications such as S6a/d. It is assumed that obtaining the relevant MCC/MNC values from the MSISDN can be achieved in the PLMN to which the SMS-GMSC belongs. Otherwise MAP based routing is used. This routing principle may be completed with other routing solutions in the future.

NOTE 2: The Number portability resolution in the PLMN of the SMS-GMSC can be handled by an intermediate Diameter agent consulting a Number Portability Database of the Network Portability domain to which the PLMN of the SMS-GMSC belongs.

If the SMS-SC or the SMS-GMSC, in a retry context of SMS for IMS UE to IMS UE without MSISDN (see 3GPP TS 23.204 [17]), has stored or can obtain the address/name and the home network domain name of the HSS identified by the HSS ID, both the Destination-Realm and Destination-Host AVPs shall be present in the request.

If the SMS-SC or the SMS-GMSC, in a retry context of SMS for IMS UE to IMS UE without MSISDN (see 3GPP TS 23.204 [17]), can only obtain the MCC/MNC values from the HSS ID, the SMS-SC shall use them to build the MCC/MNC based network domain as described in subclause 19.2 of 3GPP TS 23.003 [16] and include it in the Destination-Realm AVP of the request. The request shall then be routed to the next Diameter node.

NOTE: In a retry context of MSISDN-less SMS delivery in IMS (see 3GPP TS 23.204 [17]), the SMS-SC gets the HSS-ID from the MO Forward Short Message request as described in subclause 6.2.1.

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.1.1.3 Routing in the HPLMN

When the request reaches a Diameter node in the home PLMN of the user and when multiple and separately addressable HSSs have been deployed in the home PLMN, the identity of the HSS that holds the subscriber data for a given user identified by its MSISDN may be retrieved by a user identity to HSS resolution mechanism as described in subclause 5.4.

When the request (i.e Send Routing Info for SM or Report SM Delivery Status) for SM occurs in the retry context of SMS for IMS UE to IMS UE without MSISDN (see 3GPP TS 23.204 [17]), the Diameter identity of the HSS that holds the subscriber data for a given user may be retrieved by a user identity to HSS resolution mechanism as described in subclause 5.4, where the HSS ID conveyed in the request is considered as a user identity.

Consequently, the Destination-Host AVP is declared as optional in the ABNF for all requests initiated by an SMS-GMSC or a SMS Router.

The HSS, when receiving a Send Routing Info for SM request, checks if an SMS Router is configured in the home network or if an IP-SM-GW has been registered for the user. If yes, the HSS shall act as a Diameter proxy and forward the request to the SMS Router or to the IP-SM-GW, by inserting the Diameter address of the SMS Router or of the IP-SM-GW as the Diameter destination address. If the Send Routing Info for SM request occurs in the retry context of SMS for IMS UE to IMS UE without MSISDN (see 3GPP TS 23.204 [17]), the HSS shall return the IP-SM-GW address and shall not forward the request to an IP-SM-GW.

If the Vendor-Specific-Application-ID AVP is received in any of the commands, it may be ignored by the receiving node, and it shall not be used for routing purposes.

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.1.2 Requests from the HSS

This clause specifies the use of the Diameter routing AVPs Destination-Realm and Destination-Host over the S6c interface for Diameter command requests from the HSS (i.e. for the Alert SC procedure).

If the HSS has stored the address/name of the SMS-SC and the associated home network domain name in the Message Waiting Data of the user, both the Destination-Realm and Destination-Host AVPs shall be present in the Diameter request. Otherwise the routing shall use MAP.

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.2 Commands

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.2.1 Introduction

This section defines the Command code values and related ABNF for each command described for the S6c interface.

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.2.2 Command-Code values

This section defines the Command-Code values for the S6c interface application as allocated by IANA in the IETF RFC 5516 [8].

Every command is defined by means of the ABNF syntax IETF RFC 2234 [6], according to the rules in IETF RFC 3588 [7]. In the case, the definition and use of an AVP is not specified in this document, the guidelines in IETF RFC 3588 [7] shall apply.

NOTE: For this release, the Vendor-Specific-Application-ID is included as an optional AVP in all commands in order to ensure interoperability with diameter agents following a strict implementation of IETF RFC 3588 [7], by which messages not including this AVP will be rejected. IETF RFC 3588 [7] indicates that the AVP shall be present in all proxiable commands, such as those specified here, despite that the contents of this AVP are redundant since the Application ID is already present in the command header. This AVP may be removed in subsequent revisions of this specification, once the diameter base protocol is updated accordingly.

The following Command Codes are defined in this specification:

Table 5.3.2.2/1: Command-Code values for S6c

Command-Name	Abbreviation	Code	Section
Send-Routing-Info-for-SM-Request	SRR	8388647	5.3.2.3
Send-Routing-Info-for-SM-Answer	SRA	8388647	5.3.2.4
Alert-Service-Centre-Request	ALR	8388648	5.3.2.5
Alert-Service-Centre-Answer	ALA	8388648	5.3.2.6
Report-SM-Delivery-Status-Request	RDR	8388649	5.3.2.7
Report-SM-Delivery-Status-Answer	RDA	8388649	5.3.2.8

For these commands, the Application-ID field shall be set to 16777312 (application identifier of the S6c interface application allocated by IANA).

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.2.3 Send-Routing-Info-for-SM-Request (SRR) Command

The Send-Routing-Info-for-SM-Request (SRR) command, indicated by the Command-Code field set to 8388647 and the "R" bit set in the Command Flags field, is sent from SMS-GMSC to HSS or SMS Router or from SMS Router to HSS.

Message Format:

< Send-Routing-Info-for-SM-Request > ::= < Diameter Header: 8388647, REQ, PXY, 16777312 >
< Session-Id >
[DRMP]
[Vendor-Specific-Application-Id]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
[Destination-Host]
{ Destination-Realm }
[MSISDN]
[User-Name]
[SMSMI-Correlation-ID]
*[Supported-Features]
[SC-Address]
[SM-RP-MTI]
[SM-RP-SMEA]
[SRR-Flags]
[SM-Delivery-Not-Intended]
*[AVP]
*[Proxy-Info]
*[Route-Record]

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.2.4 Send-Routing-info-for-SM-Answer (SRA) Command

The Send-Routing-Info-for-SM-Answer command (SRA) command, indicated by the Command-Code field set to 8388647 and the 'R' bit cleared in the Command Flags field, is sent from HSS to SMS-GMSC or SMS Router or from SMS Router to SMS-GMSC.

Message Format

< Send-Routing-info-for-SM-Answer > ::= < Diameter Header: 8388647, PXY, 16777312 >
< Session-Id >
[DRMP]
[Vendor-Specific-Application-Id]
[Result-Code]
[Experimental-Result]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
[User-Name]
*[Supported-Features]
[Serving-Node]
[Additional-Serving-Node]
[LMSI]
[User-Identifier]

[MWD-Status]
[MME-Absent-User-Diagnostic-SM]
[MSC-Absent-User-Diagnostic-SM]
[SGSN-Absent-User-Diagnostic-SM]
*[AVP]
*[Failed-AVP]
*[Proxy-Info]
*[Route-Record]

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.2.5 Alert-Service-Centre-Request (ALR) Command

The Alert-Service-Centre-Request (ALR) command, indicated by the Command-Code field set to 8388648 and the "R" bit set in the Command Flags field, is sent from the HSS to the SMS-IWMSC and from the MME or SGSN to the SMS-GMSC (possibly via an SMS Router).

Message Format:

< Alert-Service-Centre-Request > ::= < Diameter Header: 8388648, REQ, PXY, 16777312 >
< Session-Id >
[DRMP]
[Vendor-Specific-Application-Id]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
[Destination-Host]
{ Destination-Realm }
{ SC-Address }
{ User-Identifier }
[SMSMI-Correlation-ID]
[Maximum-UE-Availability-Time]
[SMS-GMSC-Alert-Event]
[Serving-Node]
*[Supported-Features]
*[AVP]
*[Proxy-Info]
*[Route-Record]

[DOCOMO Compliance]

Compliance : Not Compliance

5.3.2.6 Alert-Service-Centre-Answer (ALA) Command

The Alert-Service-Centre-Answer (ALA) command, indicated by the Command-Code field set to 8388648 and the 'R' bit cleared in the Command Flags field, is sent from the SMS-IWMSC to the HSS and from the SMS-GMSC to the MME or SGSN (possibly via an SMS Router).

Message Format

< Alert-Service-Centre-Answer > ::= < Diameter Header: 8388648, PXY, 16777312 >
< Session-Id >
[DRMP]

[Vendor-Specific-Application-Id]
[Result-Code]
[Experimental-Result]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
*[Supported-Features]
*[AVP]
*[Failed-AVP]
*[Proxy-Info]
*[Route-Record]

[DOCOMO Compliance]

Compliance : Not Compliance

5.3.2.7 Report-SM-Delivery-Status-Request (RDR) Command

The Report-SM-Delivery-Status-Request (RDR) command, indicated by the Command-Code field set to 8388649 and the "R" bit set in the Command Flags field, is sent from SMS-GMSC or IP-SM-GW to HSS.

Message Format:

< Report-SM-Delivery-Status-Request > ::= < Diameter Header: 8388649, REQ, PXY, 16777312 >
< Session-Id >
[DRMP]
[Vendor-Specific-Application-Id]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
[Destination-Host]
{ Destination-Realm }
*[Supported-Features]
{ User-Identifier }
[SMSMI-Correlation-ID]
{ SC-Address }
{ SM-Delivery-Outcome }
[RDR-Flags]
*[AVP]
*[Proxy-Info]
*[Route-Record]

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.2.8 Report-SM-Delivery-Status-Answer (RDA) Command

The Report-SM-Delivery-Status-Answer (RDA) command, indicated by the Command-Code field set to 8388649 and the 'R' bit cleared in the Command Flags field, is sent from HSS to SMS-GMSC or IP-SM-GW.

Message Format

< Report-SM-Delivery-Status-Answer > ::= < Diameter Header: 8388649, PXY, 16777312 >
< Session-Id >
[DRMP]

[Vendor-Specific-Application-Id]
[Result-Code]
[Experimental-Result]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
*[Supported-Features]
[User-Identifier]
*[AVP]
*[Failed-AVP]
*[Proxy-Info]
*[Route-Record]

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.3 AVPs

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.3.1 General

The following table specifies the Diameter AVPs defined for the S6c interface protocol, their AVP Code values, types, possible flag values and whether or not the AVP may be encrypted. The Vendor-ID header of all AVPs defined in this specification shall be set to 3GPP (10415).

For all AVPs which contain bit masks and are of the type Unsigned32, e.g. TFR-Flags, bit 0 shall be the least significant bit. For example, to get the value of bit 0, a bit mask of 0x0001 should be used.

Table 5.3.3.1/1: S6c specific Diameter AVPs

				AVP Flag rules				
Attribute Name	**AVP Code**	**Section defined**	**Value Type**	**Must**	**May**	**Should not**	**Must not**	**May Encr.**
SM-RP-MTI	3308	5.3.3.2	Enumerated	M, V				No
SM-RP-SMEA	3309	5.3.3.3	OctetString	M, V				No
SRR-Flags	3310	5.3.3.4	Unsigned32	M, V				No
SM-Delivery-Not-Intended	3311	5.3.3.5	Enumerated	M, V				No
MWD-Status	3312	5.3.3.8	Unsigned32	M, V				No
MME-Absent-User-Diagnostic-SM	3313	5.3.3.9	Unsigned32	M, V				No
MSC-Absent-User-Diagnostic-SM	3314	5.3.3.10	Unsigned32	M, V				No
SGSN-Absent-User-Diagnostic SM	3315	5.3.3.11	Unsigned32	M, V				No
SM-Delivery-Outcome	3316	5.3.3.14	Grouped	M, V				No
MME-SM-Delivery-Outcome	3317	5.3.3.15	Grouped	M, V				No
MSC-SM-Delivery-Outcome	3318	5.3.3.16	Grouped	M, V				No
SGSN-SM-Delivery-Outcome	3319	5.3.3.17	Grouped	M, V				No
IP-SM-GW-SM-Delivery-Outcome	3320	5.3.3.18	Grouped	M, V				No
SM-Delivery-Cause	3321	5.3.3.19	Enumerated	M, V				No
Absent-User-Diagnostic-SM	3322	5.3.3.20	Unsigned32	M, V				No
RDR-Flags	3323	5.3.3.21	Unsigned32	V			M	No
Maximum-UE-Availability-Time	3329	5.3.3.22	Time	V			M	No
SMS-GMSC-Alert-Event	3333	5.3.3.23	Unsigned32	V			M	No

NOTE 1: The AVP header bit denoted as "M", indicates whether support of the AVP is required. The AVP header bit denoted as "V" indicates whether the optional Vendor-ID field is present in the AVP header. For further details, see IETF RFC 3588 [4].

NOTE 2: If the M-bit is set for an AVP and the receiver does not understand the AVP, it shall return a rejection. If the M-bit is not set for an AVP, the receiver shall not return a rejection, whether or not it understands the AVP. If the receiver understands the AVP but the M-bit value does not match with the definition in this table, the receiver shall ignore the M-bit.

The following table specifies the Diameter AVPs re-used from existing Diameter Applications, including a reference to their respective specifications and when needed, a short description of their use within this interface.

Any other AVPs from existing Diameter Applications, except for the AVPs from Diameter Base Protocol, do not need to be supported. The AVPs from Diameter Base Protocol are not included in table 5.3.3.1/2, but they may be re-used for this interface.

Table 5.3.3.1/2: S6c re-used Diameter AVPs

Attribute Name	Reference	Comments	M-bit
User-Name	IETF RFC 3588 [7]		Must
MSISDN	3GPP TS 23.329 [14]		
SC-Address	3GPP TS 29.338	It is defined for the SGd/Gdd interface, see subclause 6.3.3.2	
LMSI	3GPP TS 29.173 [10]		
Serving-Node	3GPP TS 29.173 [10]	See subclause 5.3.3.6	
MSC-Number	3GPP TS 29.173 [10]		
MME-Name	3GPP TS 29.173 [10]		
MME-Realm	3GPP TS 29.173 [10]		Must
MME-Number-for-MT-SMS	3GPP TS 29.272 [4]		Must
SGSN-Number	3GPP TS 29.272 [4]		
SGSN-Name	3GPP TS 29.173 [10]		
SGSN-Realm	3GPP TS 29.173[10]		
Additional-Serving-Node	3GPP TS 29.173 [10]	See subclause 5.3.3.7	
User-Identifier	3GPP TS 29.336 [15]		
SM-Delivery-Failure-Cause	3GPP TS 29.338	It is defined for the SGd/Gdd interface, see subclause 6.3.3.5	
IP-SM-GW-Name	3GPP TS 29.336 [15]		
IP-SM-GW-Number	3GPP TS 29.336 [15]		
SMSMI-Correlation-ID	3GPP TS 29.338	It is defined for the SGd/Gdd interface, see subclause 6.3.3.2	
Destination-SIP-URI	3GPP TS 29.338	It is defined for the SGd/Gdd interface, see subclause 6.3.3.2	
Supported-Features	3GPP TS 29.229 [5]		
Feature-List-ID	3GPP TS 29.229 [5]	See subclause 5.3.3.12	
Feature-List	3GPP TS 29.229 [5]	See subclause 5.3.3.13	
DRMP	IETF RFC 7944 [19]	see section 5.3.3.24	Must not set

NOTE 1: The M-bit settings for re-used AVPs override those of the defining specifications that are referenced. Values include: "Must set", "Must not set". If the M-bit setting is blank, then the defining specification applies.

NOTE 2: If the M-bit is set for an AVP and the receiver does not understand the AVP, it shall return a rejection. If the M-bit is not set for an AVP, the receiver shall not return a rejection, whether or not it understands the AVP. If the receiver understands the AVP but the M-bit value does not match with the definition in this table, the receiver shall ignore the M-bit.

[DOCOMO Compliance]

Compliance : Not Compliance

Comment :

- The description hatched with gray is unsupported.

5.3.3.2 SM-RP-MTI

The SM-RP-MTI AVP is of type Enumerated and shall contain the RP-Message Type Indicator of the Short Message. The following values are defined:

- SM_DELIVER (0)
- SM_STATUS_REPORT (1)

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.3.3 SM-RP-SMEA

The SM-RP-SMEA AVP is of type OctetString and shall contain the RP-Originating SME-address of the Short Message Entity that has originated the SM. It shall be formatted according to the formatting rules of the address fields described in 3GPP TS 23.040 [3].

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.3.4 SRR-Flags

The SRR-Flags AVP is of type Unsigned32 and it shall contain a bit mask. The meaning of the bits shall be as defined in table 5.3.3.4./1:

Table 5.3.3.4/1: SRR-Flags

Bit	Name	Description
0	GPRS-Indicator	This bit shall be set if the SMS-GMSC supports receiving of two serving nodes addresses from the HSS.
1	SM-RP-PRI	This bit shall be set if the delivery of the short message shall be attempted when a service centre address is already contained in the Message Waiting Data file
2	Single-Attempt-Delivery	This bit if set indicates that only one delivery attempt shall be performed for this particular SM.
NOTE 1: Bits not defined in this table shall be cleared by the sending entity and discarded by the receiving entity.		

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.3.5 SM-Delivery-Not-Intended

The SM-Delivery-Not-Intended AVP is of type Enumerated and shall indicate by its presence that delivery of a short message is not intended. It further indicates whether only IMSI or only MCC+MNC with the following values:

- ONLY_IMSI_REQUESTED (0),
- ONLY_MCC_MNC_REQUESTED (1).

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.3.6 Serving-Node

The Serving-Node AVP is of type Grouped. This AVP shall contain the information about the network node serving the targeted SMS user. It is originally defined in 3GPP TS 29.173 [10].

AVP format

Serving-Node ::=<AVP header: 2401 10415>

[SGSN-Name]

[SGSN-Realm]

[SGSN-Number]

[MME-Name]

[MME-Realm]

[MME-Number-for-MT-SMS]

[MSC-Number]

[IP-SM-GW-Number]

[IP-SM-GW-Name]

[IP-SM-GW-Realm]

*[AVP]

The following combinations are allowed:

a) SGSN-Number

b) SGSN-Name & SGSN-Realm & SGSN-Number if the HSS supports the "Gdd in SGSN" feature and has received the "Gdd in SGSN" indication over S6a or Gr interface from the SGSN (cf. 3GPP TS 29.272 [4] and 3GPP TS 29.002 [9])

c) MME-Name & MME-Realm & MME-Number-for-MT-SMS

d) MSC-Number

e) MSC-Number & MME-Name & MME-Realm

f) IP-SM-GW-Number

g) IP-SM-GW-Number & IP-SM-GW-Name.

[DOCOMO Compliance]

Compliance : Not Compliance

5.3.3.7 Additional-Serving-Node

The Additional-Serving-Node AVP is of type Grouped. This AVP shall contain the information about the network node serving the targeted user. It is originally defined in 3GPP TS 29.173 [10].

AVP format

Additional-Serving-Node ::= <AVP header: 2406 10415>

[SGSN-Name]

[SGSN-Realm]

[SGSN-Number]

[MME-Name]

[MME-Realm]

[MME-Number-for-MT-SMS]

[MSC-Number]

*[AVP]

The following combinations are allowed:

a) SGSN-Number

b) SGSN-Name & SGSN-Realm & SGSN-Number if the HSS supports the "Gdd in SGSN" feature and has received the "Gdd in SGSN" indication over S6a or Gr interface from the SGSN (cf. 3GPP TS 29.272 [4] and 3GPP TS 29.002 [9]

c) MME-Name & MME-Realm & MME-Number-for-MT-SMS

d) MSC-Number

e) MSC-Number & MME-Name & MME-Realm

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.3.8 MWD-Status

The MWD-Status AVP is of type Unsigned32 and it shall contain a bit mask. The meaning of the bits shall be as defined in table 5.3.3.8/1:

Table 5.3.3.8/1: MWD Status

bit	name	Description
0	SC-Address Not included	This bit when set shall indicate the presence of the SC Address in the Message Waiting Data in the HSS.
1	MNRF-Set	This bit, when set, shall indicate that the MNRF flag is set in the HSS
2	MCEF-Set	This bit, when set, shall indicate that the MCEF flag is set in the HSS.
3	MNRG-Set	This bit, when set, shall indicate that the MNRG flag is set in the HSS
NOTE:	Bits not defined in this table shall be cleared by the sending HSS and discarded by the receiving MME.	

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.3.9 MME-Absent-User-Diagnostic-SM

The MME-Absent-User-Diagnostic-SM AVP is of type Unsigned32 and shall indicate the diagnostic explaining the absence of the user given by the MME. The values are defined in 3GPP TS 23.040 [3] subclause 3.3.2.

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.3.10 MSC-Absent-User-Diagnostic-SM

The MSC-Absent-User-Diagnostic-SM AVP is of type Unsigned32 and shall indicate the diagnostic explaining the absence of the user given by the MSC. The values are defined in 3GPP TS 23.040 [3] subclause 3.3.2.

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.3.11 SGSN-Absent-Subscriber-Diagnostic-SM

The SGSN-Absent-User-Diagnostic-SM AVP is of type Unsigned32 and shall indicate the diagnostic explaining the absence of the user given by the SGSN. The values are defined in 3GPP TS 23.040 [3] subclause 3.3.2.

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.3.12 Feature-List-ID AVP

The syntax of this AVP is defined in 3GPP TS 29.229 [5]. For this release, the Feature-List-ID AVP value shall be set to 1.

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.3.13 Feature-List AVP

The syntax of this AVP is defined in 3GPP TS 29.229 [5]. A null value indicates that there is no feature used by the application.

NOTE: There is no feature defined for this release.

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.3.14 SM-Delivery-Outcome

The SM-Delivery-Outcome AVP is of type Grouped. This AVP contains the result of the SM delivery.

AVP format:

SM-Delivery-Outcome::= <AVP header: 3316 10415>

[MME-SM-Delivery-Outcome]

[MSC-SM-Delivery-Outcome]

[SGSN-SM-Delivery-Outcome]

[IP-SM-GW-SM-Delivery-Outcome]

*[AVP]

[DOCOMO Compliance]

Compliance : Not Compliance

5.3.3.15 MME-SM-Delivery-Outcome

The MME-Delivery-Outcome AVP is of type grouped and shall indicate the outcome of the SM delivery for setting the message waiting data in the HSS when the SM delivery is with an MME.

AVP format:

MME-SM-Delivery-Outcome::= <AVP header: 3317 10415>>

[SM-Delivery-Cause]

[Absent-User-Diagnostic-SM]

[DOCOMO Compliance]

Compliance : Not Compliance

5.3.3.16 MSC-SM-Delivery-Outcome

The MSC-Delivery-Outcome AVP is of type grouped and shall indicate the outcome of the SM delivery for setting the message waiting data in the HSS when the SM delivery is with an MSC.

AVP format:

MSC-SM-Delivery-Outcome::= <AVP header: 3318 10415>

[SM-Delivery-Cause]

[Absent-User-Diagnostic-SM]

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.3.17 SGSN-SM-Delivery-Outcome

The SGSN-Delivery-Outcome AVP is of type grouped and shall indicate the outcome of the SM delivery for setting the message waiting data in the HSS when the SM delivery is with an SGSN.

AVP format:

SGSN-SM-Delivery-Outcome::= <AVP header: 3319 10415>

[SM-Delivery-Cause]

[Absent-User-Diagnostic-SM]

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.3.18 IP-SM-GW-SM-Delivery-Outcome

The IP-SM-GW-SM-Delivery-Outcome AVP is of type grouped and shall indicate the outcome of the SM delivery for setting the message waiting data when the SM delivery is with an IP-SM-GW. The following values are defined.

AVP format:

IP-SM-GW-SM-Delivery-Outcome::= <AVP header: 3320 10415>

[SM-Delivery-Cause]

[Absent-User-Diagnostic-SM]

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.3.19 SM-Delivery-Cause

The SM-Delivery-Cause AVP is of type Enumerated and shall indicate the cause of the SMP delivery result. The following values are defined:

- UE_ MEMORY_CAPACITY_EXCEEDED (0)
- ABSENT_USER (1)
- SUCCESSFUL_TRANSFER (2)

[DOCOMO Compliance]

Compliance : Not Compliance

5.3.3.20 Absent-User-Diagnostic-SM

The Absent-User-Diagnostic-SM AVP is of type Unsigned32 and shall indicate the diagnostic explaining the absence of the subscriber. The values are defined in 3GPP TS 23.040 [3] subclause 3.3.2.

[DOCOMO Compliance]

Compliance : Full Compliance

5.3.3.21 RDR-Flags

The RDR-Flags AVP is of type Unsigned32 and it shall contain a bit mask. The meaning of the bits shall be as defined in table 5.3.3.21/1:

Table 5.3.3.21/1: RDR-Flags

Bit	Name	Description
0	Single-Attempt-Delivery	This bit if set indicates that only one delivery attempt shall be performed for this particular SM.
NOTE 1: Bits not defined in this table shall be cleared by the sending entity and discarded by the receiving entity.		

[DOCOMO Compliance]

Compliance : Not Applicable

5.3.3.22 Maximum-UE-Availability-Time

The Maximum-UE-Availability-Time is of type Time and in shall contain the timestamp (in UTC) until which a UE using a power saving mechanism (such as extended idle mode DRX) is expected to be reachable for SM Delivery.

[DOCOMO Compliance]

Compliance : Not Compliance

5.3.3.23 SMS-GMSC-Alert-Event

The SMS-GMSC-Alert-Event AVP is of type Unsigned32 and it shall contain a bit mask. The meaning of the bits shall be as defined in table 5.3.3.23/1:

Table 5.3.3.23/1: SMS-GMSC-Alert-Event

Bit	Name	Description
0	UE-Available-For-MT-SMS	This bit, when set, shall indicate that the UE is now available for MT SMS
1	UE-Under-New-Serving-Node	This bit, when set, shall indicate that the UE has moved under the coverage of another MME or SGSN.
NOTE 1: Bits not defined in this table shall be cleared by the sending entity and discarded by the receiving entity.		

[DOCOMO Compliance]

Compliance : Not Compliance

5.3.3.24 DRMP

The DRMP AVP is of type Enumerated and it is defined in IETF RFC 7944 [19]. This AVP allows the HSS, the SMS-GMSC, the SMS-Router and the IP-SM-GW to indicate the relative priority of Diameter messages over the S6c interface.

[DOCOMO Compliance]

Compliance : Not Compliance

5.4 User identity to HSS resolution

The User identity to HSS resolution mechanism enables the SMS-GMSC or SMS Router in the home PLMN or Diameter proxy agents in the home PLMN to find the identity of the HSS that holds the subscriber data for a given user identified by its MSISDN or by its IMSI when multiple and separately addressable HSSs have been deployed in the home PLMN. The resolution mechanism is not required in PLMNs that utilise a single HSS.

This User identity to HSS resolution mechanism may rely on routing capabilities provided by Diameter and be implemented in the home PLMN within dedicated Diameter Agents (Proxy Agents) responsible for determining the HSS identity based on the provided user identity. If this Diameter based implementation is selected by the home PLMN operator, the principles described below shall apply.

When more than one independently addressable HSS are deployed in the home PLMN, each SMS-GMSC or SMS-Router network of the home PLMN shall be configured with the address/identity of a Diameter Agent (Proxy Agent) implementing this resolution mechanism.

Diameter Relay agents and/or Diameter Proxy agents in the home PLMN receiving the Diameter signalling from SMS-GMSC located in other PLMNs shall be configured with the address/identity of a Diameter Agent (Proxy Agent) implementing this resolution mechanism.

To get the HSS identity that holds the subscriber data for a given user identity in the home network, the Diameter request normally destined to the HSS shall be sent to the pre-configured address/identity of a Diameter Proxy agent supporting the User identity to HSS resolution mechanism.

- If this Diameter request is received by a Diameter Redirect Agent, the Diameter Redirect Agent shall determine the HSS identity based on the provided user identity (i.e. MSISDN or IMSI) and shall return a notification of redirection towards the HSS identity, in response to the Diameter request. Multiple HSS identities may be included in the response, as specified in IETF RFC 3588 [4]. In such a case, the requesting Diameter entity shall send the Diameter request to the first HSS identity in the ordered list received in the Diameter response from the Diameter Redirect Agent. If no successful response to the Diameter request is received, the requesting Diameter entity shall send a Diameter request to the next HSS identity in the ordered list. This procedure shall be repeated until a successful response from an HSS is received. After the user identity to HSS resolution, the MME or the SGSN shall store the determined HSS identity/name/Realm and shall use it in further Diameter requests to the same user identity.

- If this Diameter request is received by a Diameter Proxy Agent, the Diameter Proxy Agent shall determine the HSS identity based on the provided user identity (i.e. MSISDN or IMSI) and shall forward the Diameter request directly to the HSS. In this case, the user identity to HSS resolution decision is communicated to the SMS-GMSC in the Origin-Host/Origin-Realm AVPs of the response.

NOTE: Alternatives to the user identity to HSS resolution Diameter based implementation are outside the scope of this specification.

The User identity to HSS resolution mechanism, in a retry context of SMS for IMS UE to IMS UE without MSISDN (see 3GPP TS 23.204 [17]), applies as described in this clause for requests issued by the SMS-SC to a HSS and where the IMSI of the user is replaced by the HSS ID of the HSS storing the subscription data of the user.

[DOCOMO Compliance]

Compliance : Not Applicable

6 Diameter based SGd/Gdd interfaces between MME/SGSN and central SMS functions

[DOCOMO Compliance]

Compliance : Not Applicable

6.1 Introduction

The SGd interface enables the transfer of short messages between the MME, the SMS-IWMSC, the SMS-GMSC and the SMS Router, and the alerting of the SMS-GMSC by the MME (possibly via an SMS Router), as described in 3GPP TS 23.040 [3].

The Gdd interface enables the transfer of short messages between the SGSN, the SMS-IWMSC, the SMS-GMSC and the SMS Router, and the alerting of the SMS-GMSC by the SGSN (possibly via an SMS Router) as described in 3GPP TS 23.040 [3].

[DOCOMO Compliance]

Compliance : Full Compliance

6.2 Procedures description

[DOCOMO Compliance]

Compliance : Not Applicable

6.2.1 MO Forward Short Message procedure

[DOCOMO Compliance]

Compliance : Not Applicable

6.2.1.1 General

This procedure shall be used between the serving MME or SGSN or IP-SM-GW and the SMS-IWMSC to forward mobile originated short messages from a mobile user to a Service Centre.

This procedure is used according to the call flows described in 3GPP TS 23.040 [3] clause 10.

This procedure may also be used between the SMS-IWMSC and the MTC-IWF to forward mobile originated short messages from a mobile user to an MTC-IWF; see 3GPP TS 23.682 [18].

Table 6.2.1.1/1 specifies the involved information elements for the request.

Table 6.2.1.1/2 specifies the involved information elements for the answer.

This procedure is mapped to the commands MO-Forward-Short-Message-Request/Answer (OFR/OFA) in the Diameter application specified in subclause 6.3.2.

Table 6.2.1.1/1: MO Forward Short Message Request

Information element name	Mapping to Diameter AVP	Cat.	Description
SM RP DA	SC-Address	M	When used between MME or SGSN or IP-SM-GW and SMS-IWMSC, this information element shall contain the Service Centre address received from the mobile station. When used between SMS-IWMSC and MTC-IWF, this information element shall contain the MTC-IWF address as pre-configured in the SMS-SC.
SM RP OA	User-Identifier	M	This information element shall contain: - the IMSI if it is available; - the MSISDN of the user when it exists. - a dummy MSISDN value in the context of MSISDN-less SMS delivery in IMS (see 3GPP TS 23.204 [17]), if IMSI is not available. In this case the originating user is identified by the Originating SIP-URI (see SMSMI-Correlation ID).
SM RP UI	SM-RP-UI	M	This information element shall contain the short message transfer protocol data unit
SMSMI-Correlation ID	SMSMI-Correlation-ID	C	This information element indicates by its presence that the request is sent in the context of MSISDN-less SMS delivery in IMS (see 3GPP TS 23.204 [17]). When present, this information element shall contain an HSS-ID identifying the destination user's HSS, a Destination SIP-URI identifying the MSISDN-less destination user, and an Originating SIP-URI identifying the MSISDN-less originating user.
OFR Flags	OFR-Flags	C	This information element shall contain a bit mask. See 6.3.3.12 for the meaning of the bits.
SM Delivery Outcome	SM-Delivery-Outcome	C	This information element shall be present if the SMSMI Correlation ID is present and shall contain the IP-SM-GW SM Delivery Outcome with the causes for setting the message waiting data in the HSS.
Supported Features	Supported-Features	O	If present, this information element shall contain the list of features supported by the origin host.

NOTE: In the context of MSISDN-less SMS delivery in IMS (see 3GPP TS 23.204 [17]), the IP-SM-GW gets the HSS-ID and the SM Delivery Outcome from the SIP message coming from the IMS network of the destination user and indicating a temporary SMS delivery failure.

Table 6.2.1.1/2: MO-Forward Short Message Answer

Information element name	Mapping to Diameter AVP	Cat.	Description
Result	Result-Code / Experimental-Result	M	This information element shall contain the result of the operation. The Result-Code AVP shall be used to indicate success / errors as defined in the Diameter Base Protocol. The Experimental-Result AVP shall be used for SGd/Gdd/T4 errors. This is a grouped AVP which shall contain the 3GPP Vendor ID in the Vendor-Id AVP, and the error code in the Experimental-Result-Code AVP. The following errors are applicable: - Facility Not Supported; - SM Delivery Failure.
SM Delivery Failure Cause	SM-Delivery-Failure-Cause	C	If the Experimental-Result-Code is set to DIAMETER_ERROR_SM_DELIVERY_FAILURE, this information element shall be present and indicate one of the following: - unknown Service Centre/MTC-IWF address; - Service Centre/MTC-IWF congestion; - invalid Short Message Entity address; - user not Service Centre/SCS-AS user. It may be completed with a Diagnostic information element.
SM RP UI	SM-RP-UI	O	If present, this information element shall contain a short message transfer protocol data unit in the message delivery acknowledgement from the SMS-IWMSC to the MME or SGSN
Supported Features	Supported-Features	O	If present, this information element shall contain the list of features supported by the origin host.
External-Identifier	External-Identifier	C	This information element shall contain the External Identifier identifying the sender of the short message. Shall be present when the answer is sent over T4 to the SMS-IWMSC for charging.

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

6.2.1.2 Detailed behaviour of the MME, the SGSN and the IP-SM-GW

When the "SMS in MME" feature is applied for the UE, the MME shall make use of this procedure to forward mobile originated short messages received from the UE to the SMS-IWMSC associated to the SMS-SC indicated by the UE.

When the SGSN supports the SMS service for the UE, the SGSN shall make use of this procedure to forward mobile originated short messages received from the UE to the SMS-IWMSC associated to the SMS-SC indicated by the UE.

The IP-SM-GW shall make use of this procedure to forward mobile originated short messages received from the UE to the SMS-IWMSC associated to the SMS-SC indicated by the UE. This procedure shall be also used in the context of MSISDN-less SMS delivery in IMS (see 3GPP TS 23.204 [17]), when the direct SMS delivery has failed,

The MME or the SGSN shall check if the SMS related subscription data (e.g. ODB data and Call Barring) allows forwarding the short message.

[DOCOMO Compliance]

Compliance : Full Compliance

6.2.1.3 Detailed behaviour of the SMS-IWMSC

When receiving the MO Forward Short Message Request, the SMS-IWMSC shall check if the SMS-SC is known, if it is not, an Experimental-Result-Code set to DIAMETER_ERROR_SM_DELIVERY_FAILURE and a SM Delivery Failure Cause indicating "unknown Service Centre address" shall be returned to the MME or the SGSN.

The SMS IWMSC shall then pass the short message to the addressed SMS-SC, or, if the destination user identity maps to an MTC-IWF based on a pre-configured mapping table, forward it to the appropriate MTC-IWF.

If the SMS-SC or MTC-IWF returns a negative acknowledgement, an Experimental-Result-Code set to DIAMETER_ERROR_SM_DELIVERY_FAILURE and a SM Delivery Failure Cause indicating the cause given by the SMC-SC or MTC-IWF shall be returned to the MME or the SGSN.

If the SMS-SC or MTC-IWF returns a positive acknowledgement to the SMS IWMSC, a Result-Code set to DIAMETER_SUCCESS shall be returned to the MME or the SGSN.

If a requested facility is not supported, an Experimental-Result-Code set to DIAMETER_ERROR_FACILITY_NOT_SUPPORTED shall be returned.

[DOCOMO Compliance]

Compliance : Not Applicable

6.2.2 MT Forward Short Message procedure

[DOCOMO Compliance]

Compliance : Not Applicable

6.2.2.1 General

This procedure shall be used between the SMS-GMSC and the serving MME or SGSN (transiting an SMS Router, if present) or IP-SM-GW to forward mobile terminated short messages.

This procedure is used according to the call flows described in 3GPP TS 23.040 [3] clause 10.

Table 6.2.2.1/1 specifies the involved information elements for the request.

Table 6.2.2.1/2 specifies the involved information elements for the answer.

This procedure is mapped to the commands MT-Forward-Short-Message-Request/Answer (TFR/TFA) in the Diameter application specified in subclause 6.3.2.

Table 6.2.2.1/1: MT Forward Short Message Request

Information element name	Mapping to Diameter AVP	Cat.	Description
SM RP DA	User-Name (See IETF RFC 3588 [6])	M	This information element shall contain - either an IMSI - or a HSS ID value if an SMSMI-Correlation ID is present, the destination user being identified by the Destination SIP-URI within the SMSMI Correlation ID.
SM RP OA	SC-Address	M	This information element shall contain the Service Centre address.
SMSMI Correlation ID	SMSMI-Correlation-ID	C	This information element indicates by its presence that the request is sent in the context of MSISDN-less SMS delivery in IMS (see 3GPP TS 23.204 [17]). When present, this information element shall contain the Destination SIP-URI identifying the (MSISDN-less) destination user and the Originating SIP-URI identifying the (MSISDN-less) originating user. The HSS-ID shall be absent from this information element.
SM RP UI	SM-RP-UI	M	This information element shall contain the short message transfer protocol data unit.
MME Number for MT SMS	MME-Number-for-MT-SMS	C	This Information Element contains the ISDN number of the MME (see 3GPP TS 23.003 [3]) and shall be present when the request is sent to a MME.
SGSN Number	SGSN-Number	C	This Information Element contains the ISDN number of the SGSN (see 3GPP TS 23.003 [3]) and shall be present when the request is sent to a SGSN.
TFR-Flags	TFR-Flags	C	This information element shall contain a bit mask. Bit 0 indicates when set if the Service Centre has more messages to send
SM Delivery Timer	SM-Delivery-Timer	C	This information element should be included. When present, it shall indicate the SM Delivery Timer value set in the SMS-GMSC to the IP-SM-GW, MME or S4-SGSN.
SM Delivery Start Time	SM-Delivery-Start-Time	C	This information element should be included. When present, it shall indicate the timestamp (in UTC) at which the SM Delivery Supervision Timer was started in the SMS-GMSC.
Maximum Retransmission Time	Maximum-Retransmission-Time	O	This information element, when present, shall indicate the maximum retransmission time (in UTC) until which the SMS-GMSC is capable to retransmit the MT Short Message.
SMS-GMSC Address	SMS-GMSC-Address	C	This IE shall be present if the Maximum Retransmission Time IE is present in the message. When present, this IE shall contain the E.164 number of the SMS-GMSC in the request sent by the SMS-GMSC or the E.164 number of the SMS Router in the request sent by the SMS Router.
Supported Features	Supported-Features (See 3GPP TS 29.229 [5])	O	If present, this information element shall contain the list of features supported by the origin host.

Table 6.2.2.1/2: MT Forward Short Message Answer

Information element name	Mapping to Diameter AVP	Cat.	Description
Result	Result-Code / Experimental-Result	M	This information element shall contain the result of the operation. The Result-Code AVP shall be used to indicate success / errors as defined in the Diameter Base Protocol. The Experimental-Result AVP shall be used for SGd/Gdd errors. This is a grouped AVP which shall contain the 3GPP Vendor ID in the Vendor-Id AVP, and the error code in the Experimental-Result-Code AVP. The following errors are applicable: - Unknown User; - Absent User; - User busy for MT SMS; - Illegal User; - Illegal Equipment; - SM Delivery Failure.
Absent User Diagnostic SM	Absent-User-Diagnostic-SM	O	This information element may be present when Experimental-Result-Code is set to DIAMETER_ERROR_ABSENT_USER and it shall contain the reason of the absence of the user given by the MME or the SGSN.
SM Delivery Failure Cause	SM-Delivery-Failure-Cause	C	If Experimental-Result-Code is set to DIAMETER_ERROR_SM_DELIVERY_FAILURE, this information element shall be present and indicate one of the following: - memory capacity exceeded in the mobile equipment; - UE error; - mobile equipment not equipped to support the mobile terminated short message service. It may be completed with a Diagnostic information element
SM RP UI	SM-RP-UI	O	If present, this information element shall contain a short message transfer protocol data unit in the message delivery acknowledgement from the MME to the Service Centre.
Requested Retransmission Time	Requested-Retransmission-Time	O	This information element may only be present if the Experimental-Result-Code is set to DIAMETER_ERROR_ABSENT_USER and if the Maximum Retransmission Time information element is present in the MT Forward Short Message Request. It may be included if the UE is using a power saving mechanism (such as extended idle mode DRX) and the UE is currently not reachable. When present, this shall indicate the retransmission time (in UTC) at which the SMS-GMSC is requested to retransmit the MT Short Message. The Requested Retransmission Time shall not exceed the Maximum Retransmission Time received from the SMS-GMSC.
User Identifier Alert	User-Identifier	C	This IE shall be present in the message from the SMS Router to the SMS-GMSC, if the Requested Retransmission Time IE is present in the message. When present, this information shall contain an MT Correlation ID (encoded in the User-Name AVP).
Supported Features	Supported-Features (See 3GPP TS 29.229 [5])	O	If present, this information element shall contain the list of features supported by the origin host.

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

6.2.2.2 Detailed behaviour of the MME and the SGSN

When receiving a MT Forward Short Message Request, the MME or the SGSN shall check if the IMSI is known,

If it is not known, an Experimental-Result-Code set to DIAMETER_ERROR_USER_UNKNOWN shall be returned.

The MME or the SGSN shall attempt to deliver the short message to the UE.

If the delivery of the short message to the UE is successful, the MME or the SGSN shall return a Result-Code set to DIAMETER_SUCCESS.

If the UE is not reachable via the MME, the MME shall set the MNRF flag and shall return an Experimental-Result-Code set to DIAMETER_ERROR_ABSENT_USER.

If the UE is not reachable via the SGSN, the SGSN shall set the MNRG flag and shall return an Experimental-Result-Code set to DIAMETER_ERROR_ABSENT_USER.

If the UE is using extended idle mode DRX (as defined in 3GPP TS 23.682 [18]) and the UE is expected to not respond to paging shortly or within the time frame indicated by the SM-Delivery-Timer and SM-Delivery-Start-Time IEs, the MME or SGSN may behave as specified above for a UE that is not reachachable, while still paging the UE.

NOTE 1: This mechanism is not intended for UEs which are known to wake up shortly (e.g. within the next 10 seconds) as enough time needs to elapse, between the sending of the MT Forward Short Message Answer and the subsequent Notification procedure towards the HSS when the UE becomes reachable, to enable the Report SM Delivery Status procedure to take place beforehand from the SMS-GMSC to the HSS.

If the UE is using extended idle mode DRX (as defined in 3GPP TS 23.682 [18]) and the UE is expected to respond to paging shortly or within the time frame indicated by the SM-Delivery-Timer and SM-Delivery-Start-Time IEs, the MME or SGSN should page the UE and attempt to deliver the short message to the UE.

If the UE is using a power saving mechanism such as extended idle mode DRX (see 3GPP TS 23.682 [18]), and if the MT Forward Short Message Request includes the Maximum-Retransmission-Time AVP, the MME or SGSN may return an MT Forward Short Message Answer with the Experimental-Result-Code set to DIAMETER_ERROR_ABSENT_USER and with the Requested-Retransmission-Time AVP requesting the SMS-GMSC to retransmit the Short Message at a later time prior to the Maximum Retransmission Time. In that case, the MME or SGSN shall store (if not already done) the Origin-Host, the Origin-Realm and the SMS-GMSC address received in request and shall not set the MNRF or MNRG flag.

NOTE 2: This mechanism does not cause additional signalling at the HSS to retransmit the Short Message.

If the delivery of the mobile terminated short message failed because of memory capacity exceeded or UE error or UE not SM equipped, the MME or the SGSN shall return an Experimental-Result-Code set to DIAMETER_ERROR_SM_DELIVERY_FAILURE complemented with a SM Delivery Failure Cause indication.

If a requested facility is not supported, the MME or the SGSN shall return an Experimental-Result-Code set to DIAMETER_ERROR_FACILITY_NOT_SUPPORTED.

If the user is busy for MT SMS, i.e. the mobile terminated short message transfer cannot be completed because:

- another mobile terminated short message transfer is going on and the delivery node does not support message buffering; or
- another mobile terminated short message transfer is going on and it is not possible to buffer the message for later delivery; or
- the message was buffered but it is not possible to deliver the message before the expiry of the buffering time defined in 3GPP TS 23.040 [3],

the MME or the SGSN shall return an Experimental-Result-Code set to DIAMETER_ERROR_USER_BUSY_FOR_MT_SMS.

If the delivery of the mobile terminated short message failed because the mobile station failed authentication, the MME or the SGSN shall return an Experimental-Result-Code set to DIAMETER_ERROR_ILLEGAL_USER.

If the delivery of the mobile terminated short message failed because an IMEI check failed, i.e. the IMEI was blacklisted or not white-listed, the MME or the SGSN shall return an Experimental-Result-Code set to DIAMETER_ERROR_ILLEGAL_EQUIPMENT.

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment:

- Deployment Option 2 of eDRX defined in TS23.272 is not supported.
- The description hatched with gray is unsupported.

6.2.2.3 Detailed behaviour of the SMS-GMSC

The SMS-GMSC shall make use of this procedure over the SGd interface or over the Gdd interface for the delivery of a MT short message when it has selected the serving node of which it obtained the Diameter Identity from the answer of the Send Routing Info for SM procedure.

NOTE: The SMS-GMSC is not aware that the MT Forward Short Message Request may be routed to a SMS router.

The SMS-GMSC may include the Maximum-Retransmission-Time AVP in the MT Forward Short Request to indicate that it is capable to retransmit the Short Message until the indicated maximum retransmission time, if the following conditions are fulfilled:

- the destination user pertains to the PLMN of the SMS-GMSC; and

- if an SMS Router is used for MT SMS sent to destination users pertaining to the PLMN of the SMS-GMSC, the SMS Router is known to support the Alert Service Centre procedure specified in subclause 6.2.3.

The SMS-GMSC shall include its E.164 number in the SMS-GMSC address in the request if it also includes the Maximum-Retransmission-Time AVP.

When the SMS router has received a MT Forward Short Message from the SMS-GMSC and the SMS Router has selected the MME or the SGSN for delivery, the SMS Router shall forward it to the MME or the SGSN.

If the MT Forward Short Message Request includes the Maximum-Retransmission-Time AVP, the SMS Router shall store the SMS-GMSC Diameter Identity (received in the Origin-Host and Origin-Realm AVPs) and the SMS-GMSC address received in the request and replace them by its SMS Router Diameter Identity (in the Origin-Host and Origin-Realm AVPs) and SMS Router address (E.164 number) when forwarding the request to the MME or SGSN.

When a MT Forward Short Message Answer is received from the MME, the SMS Router shall forward it to the SMS-GMSC.

If the MT Forward Short Message Answer includes the Requested-Retransmission-Time AVP, the SMS Router shall include a User Identifier Alert AVP when forwarding the answer to the SMS-GMSC.

NOTE: The User Identifier Alert is further used in the Alert Service Centre procedure specified in subclause 6.2.3 to enable the SMS-GMSC to identify and retransmit all pending MT SMS messages towards the destination user.

[DOCOMO Compliance]

Compliance : Not Applicable

6.2.3 Alert Service Centre procedure

[DOCOMO Compliance]

Compliance : Not Compliance

6.2.3.1 General

This procedure shall be used between the MME or SGSN and the SMS-GMSC, possibly via an SMS Router, to indicate that a UE, for which one or more MT SMS have been requested to be retransmitted at a later time, is now available for MT SMS delivery or that it has moved under the coverage of another MME or SGSN. This procedure is used according to the call flows described in 3GPP TS 23.040 [2] clause 10.

Table 6.2.3.1-1 specifies the involved information elements for the request.

Table 6.2.3.1-2 specifies the involved information elements for the answer.

This procedure is mapped to the commands Alert-Service-Centre-Request/Answer (ALR/ALA) in the Diameter application specified in subclause 5.3.2.

Table 6.2.3.1-1: Alert Service Centre Request

Information element name	Mapping to Diameter AVP	Cat.	Description
Service Centre Address	SC-Address	M	This IE shall contain the E.164 number of the SMS-GMSC (or SMS Router) previously received in the SMS-GMSC Address IE in the MT Forward Short Message Request.
User Identifier Alert	User-Identifier	M	This IE shall contain: - the IMSI when the request is sent from the MME or SGSN, - the User Identifier Alert previously sent in the MT Forward Short Message Answer, when the request is sent from the SMS Router to the SMS-GMSC, encoded in the User-Name AVP.
SMS-GMSC Alert Event	SMS-GMSC-Alert-Event	M	This IE shall contain the type of event that caused the Alert Service Centre Request to the SMS-GMSC: - UE is available for MT SMS; - UE has moved under the coverage of another MME or SGSN.
New Serving Node Identity	Serving-Node	C	This IE shall be present if available and if the SMS-GMSC Alert Event indicates that the UE has moved under the coverage of another MME or SGSN. When present, this IE shall contain the Diameter Identity and/or the E.164 number of the new serving node of the UE. It shall be encoded as: - an MME-Name, MME Realm and MME-Number-for-MT-SMS, if the new serving node is an MME; - an SGSN-Number and, an SGSN-Name and SGSN Realm if available, if the new serving node is an SGSN.
Supported Features	Supported-Features (See 3GPP TS 29.229 [5])	O	If present, this information element shall contain the list of features supported by the origin host.

Table 6.2.3.1-2: Alert Service Centre Answer

Information element name	Mapping to Diameter AVP	Cat.	Description
Result	Result-Code / Experimental-Result	M	This information element shall contain the result of the request. The Result-Code AVP shall be used for errors defined in the Diameter Base Protocol. The Experimental-Result AVP shall be used for S6c errors. This is a grouped AVP which contains the 3GPP Vendor ID in the Vendor-Id AVP, and the error code in the Experimental-Result-Code AVP. This information element shall contain the result of the operation with an indication of the success / errors. No errors are defined for this case.
Supported Features	Supported-Features (See 3GPP TS 29.229 [5])	O	If present, this information element shall contain the list of features supported by the origin host.

[DOCOMO Compliance]

Compliance : Not Compliance

6.2.3.2 Detailed behaviour of the MME and the SGSN

The MME or SGSN shall make use of this procedure to alert the SMS-GMSC when the UE, for which one or more MT SMS have been requested to be retransmitted at a later time, becomes available for MT SMS delivery or moves under the coverage of another MME or SGSN prior to the requested SM retransmission time.

The MME or SGSN shall delete the stored SMS-GMSC Diameter Identity (i.e. Origin-Host and Origin-Realm) and address after the Alert Service Centre procedure is completed.

[DOCOMO Compliance]

Compliance : Not Compliance

6.2.3.3 Detailed behaviour of the SMS-GMSC

When receiving an Alert Service Centre request, the SMS-GMSC shall retransmit pending MT SMS(s) for the destination user identified by the User Identifier Alert, to the same serving node if the SMS-GMSC Alert Event indicates that the UE is available for MT SMS, or to the new serving node if the SMS-GMSC Alert Event indicates that the UE has moved under the coverage of another MME or SGSN. In the latter case, if no New Serving Node Identity is received in the Alert Service Centre request, the SMS-GMSC shall initiate a Send Routing Info for SM procedure to retrieve the new serving node 's address from the HSS.

[DOCOMO Compliance]

Compliance : Not Applicable

6.2.3.4 Detailed behaviour of the SMS-Router

When receiving an Alert Service Centre request, the SMS-Router shall replace the IMSI received in the User Identifier Alert by the User Identifier Alert previously sent in the MT Forward Short Message Answer, and forward that request to the SMS-GMSC.

[DOCOMO Compliance]

Compliance : Not Applicable

6.3 Protocol specification

[DOCOMO Compliance]

Compliance : Not Applicable

6.3.1 Routing considerations

[DOCOMO Compliance]

Compliance : Not Applicable

6.3.1.1 Routing for MO Forward SM messages:

This subclause specifies the use of the Diameter routing AVPs Destination-Realm and Destination-Host over the SGd or Gdd interfaces for the Diameter command requests from the MME or from the SGSN (i.e. for the MO forward SM procedure).

Also, this subclause specifies the use of the Diameter routing AVPs Destination-Realm and Destination-Host over the T4 interface for the Diameter command requests from the SMS-IWMSC (i.e. for the MO forward SM procedure).

This subclause also applies for the Diameter command MO forward SM request from the IP-SM-GW towards an SMS-SC/SMS-IWMSC, including the case where the MO forward SM request occurs in the retry context of SMS for IMS UE to IMS UE without MSISDN (see 3GPP TS 23.204 [17]). MME or SGSN is replaced by IP-SM-GW in the text of this subclause.

If the MME or the SGSN, from the SMS-SC E164 number received from the UE, can obtain the address/name of the SMS-IWMSC and the associated home network domain name (e.g. by local configuration), both the Destination-Realm and Destination-Host AVPs shall be present in the request.

If the MME or the SGSN, from the SMS-SC E164 number received from the UE, can only obtain the MCC/MNC values of the PLMN to which the SMS-SC belongs, the MME or the SGSN shall use them to build the MCC/MNC based network domain as described in subclause 19.2 of 3GPP TS 23.003 [16] and include it in the Destination-Realm AVP of the request. The request shall then be routed to the next Diameter node.

If the MME or the SGSN cannot obtain the MCC/MNC values from the SMS-SC E164 number, the MME or the SGSN shall forward the request to a Diameter node within the same PLMN, the Destination Realm content being left to the PLMN operator choice. Then:

- if a Diameter node in the routing path insides the PLMN of the MME can obtain the MCC/MNC values of the PLMN to which the SMS-SC belongs,

- it shall use them to build the MCC/MNC based network domain as described in subclause 19.2 of 3GPP TS 23.003 [16] and include it in the Destination-Realm AVP of the request. The request shall then be routed to the next Diameter node.

If the MCC/MNC values of the PLMN to which the SMS-SC belongs cannot be obtained in the PLMN of the MME or the SGSN, the request shall be replaced in the PLMN of the MME or the SGSN by an equivalent request routed through a MAP interface (e.g. via an IWF).

NOTE 1: The inter PLMN routing principle is to reuse the routing based on a MCC/MNC based domain name as used by other Diameter applications such as S6a/d. It is assumed that obtaining the relevant MCC/MNC values from the E164 number of the SMS-SC can be achieved in the PLMN which the MME belongs to. Otherwise a MAP based routing is used. This routing principle may be completed with other routing solutions in the future.

Consequently, the Destination-Host AVP is declared as optional in the ABNF for all requests initiated by an MME or a SGSN.

The SMS-IWMSC shall be able to obtain the address/name of the MTC-IWF and the associated home network domain name from the destination SME address included in the MO TPDU (e.g. by local configuration); therefore both the Destination-Realm and Destination-Host AVPs shall be present in the request.

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- Destination-Realm uses the MME Configuration Data.
- The description hatched with gray is unsupported.

6.3.1.2 Routing for MT Forward SM messages:

This clause specifies the use of the Diameter routing AVPs Destination-Realm and Destination-Host for the Diameter command requests from the SMS-GMSC or the SMS Router (i.e. for the MT forward SM procedure).

- if the SMS-GMSC has received the Diameter address/name of an MME or of the SGSN in the answer to its interrogation to the HSS/HLR for retrieving routing information and if it selects this serving node, it shall use it to populate the Destination-Realm and Destination-Host AVPs.

- If the SMS Router has received the Diameter address/name of the MME or of the SGSN in the answer to its interrogation to the HSS/HLR for retrieving routing information and if it selects this serving node, it shall use this Diameter address/name to populate the Destination-Realm and Destination-Host AVPs.

Consequently, the Destination-Host AVP is declared as mandatory in the ABNF for all requests initiated by an SMS-GMSC or a SMS router.

[DOCOMO Compliance]

Compliance : Full Compliance

6.3.2 Commands

[DOCOMO Compliance]

Compliance : Not Applicable

Comment :

- *[AVP] is hatched with light blue because of customization AVP.

6.3.2.1 Introduction

This section defines the Command code values and related ABNF for each command described for the SGd interface.

[DOCOMO Compliance]

Compliance : Not Applicable

6.3.2.2 Command-Code values

This section defines the Command-Code values for the SGd interface application as allocated by IANA in the IETF RFC 5516 [8], the SGd interface application being used over the SGd and Gdd interfaces. The Alert Service Centre procedure used over the SGd and Gdd interfaces also uses commands of the S6c interface application.

Every command is defined by means of the ABNF syntax IETF RFC 2234 [6], according to the rules in IETF RFC 3588 [7]. In the case, the definition and use of an AVP is not specified in this document, the guidelines in IETF RFC 3588 [7] shall apply.

NOTE: For this release, the Vendor-Specific-Application-ID is included as an optional AVP in all commands in order to ensure interoperability with diameter agents following a strict implementation of IETF RFC 3588 [7], by which messages not including this AVP will be rejected. IETF RFC 3588 [7] indicates that the AVP shall be present in all proxiable commands, such as those specified here, despite that the contents of this AVP are redundant since the Application ID is already present in the command header. This AVP may be removed in subsequent revisions of this specification, once the diameter base protocol is updated accordingly.

The following Command Codes are defined in this specification:

Table 6.3.2.2/1: Command-Code values for SGd/Gdd

Command-Name	Abbreviation	Code	Section
MO-Forward-Short-Message Request	OFR	8388645	6.3.2.3
MO-Forward-Short-Message Answer	OFA	8388645	6.3.2.4
MT-Forward-Short-Message Request	TFR	8388646	6.3.2.5
MT-Forward-Short-Message Answer	TFA	8388646	6.3.2.6
Alert-Service-Centre-Request	ALR	8388648	5.3.2.5
Alert-Service-Centre-Answer	ALA	8388648	5.3.2.6

For these commands, the Application-ID field shall be set to 16777313 (application identifier of the SGd interface application, allocated by IANA), except for the ALR/ALA commands for which the Application-ID field shall be set to 16777312 (application identifier of the S6c interface application, allocated by IANA).

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

6.3.2.3 MO-Forward-Short-Message-Request (OFR) Command

The MO-Forward-Short-Message-Request (OFR) command, indicated by the Command-Code field set to 8388645 and the "R" bit set in the Command Flags field, is sent from the MME / SGSN to the SMS-IWMSC.

Message Format

< MO-Forward-Short-Message-Request > ::= < Diameter Header: 8388645, REQ, PXY, 16777313 >
< Session-Id >
[DRMP]
[Vendor-Specific-Application-Id]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
[Destination-Host]
{ Destination-Realm }
{ SC-Address }
[OFR-Flags]
*[Supported-Features]
{ User-Identifier }
{ SM-RP-UI }
[SMSMI-Correlation-ID]
[SM-Delivery-Outcome]
*[AVP]
*[Proxy-Info]
*[Route-Record]

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

6.3.2.4 MO-Forward-Short-Message-Answer (OFA) Command

The MO-Forward-Short-Message-Answer Command (OFA) command, indicated by the Command-Code field set to 8388645 and the 'R' bit cleared in the Command Flags field, is sent from the SMS-IWMSC to the MME / SGSN.

Message Format

< MO-Forward-Short-Message-Answer > ::= < Diameter Header: 8388645, PXY, 16777313 >
< Session-Id >
[DRMP]
[Vendor-Specific-Application-Id]
[Result-Code]
[Experimental-Result]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
*[Supported-Features]
[SM-Delivery- Failure-Cause]
[SM-RP-UI]
[External-Identifier]
*[AVP]
*[Failed-AVP]
*[Proxy-Info]
*[Route-Record]
*[Redirect-Host]
[Redirect-Host-Usage]

[Redirect-Max-Cache-Time]

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The maximum value of “Redirect-Host” is “8”.
- The MME doesn’t check the contents of “Redirect-Host Usage” and "Redirect-Max-Chache-Time".
- The description hatched with gray is unsupported.

6.3.2.5 MT-Forward-Short-Message-Request (TFR) Command

The MT-Forward-Short-Message-Request (TFR) command, indicated by the Command-Code field set to 8388646 and the "R" bit set in the Command Flags field, is sent from the SMS-GMSC to the MME / SGSN (transiting an SMS Router, if present).

Message Format

< MT-Forward-Short-Message-Request > ::= < Diameter Header: 8388646, REQ, PXY, 16777313 >
< Session-Id >
[DRMP]
[Vendor-Specific-Application-Id]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
{ Destination-Host }
{ Destination-Realm }
{ User-Name }
*[Supported-Features]
[SMSMI-Correlation-ID]
{ SC-Address }
{ SM-RP-UI }
[MME-Number-for-MT-SMS]
[SGSN-Number]
[TFR-Flags]
[SM-Delivery-Timer]
[SM-Delivery-Start-Time]
[Maximum-Retransmission-Time]
[SMS-GMSC-Address]
*[AVP]
*[Proxy-Info]
*[Route-Record]

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The maximum value of “Proxy-Info” is “8”.
- The MME doesn’t check the contents of “Proxy-Info” and " Route-Record ".
- The description hatched with gray is unsupported.

6.3.2.6 MT-Forward-Short-Message-Answer (TFA) Command

The MT-Forward-Short-Message-Answer Command (TFA) command, indicated by the Command-Code field set to 8388646 and the 'R' bit cleared in the Command Flags field, is sent from the MME / SGSN to the SMS-GMSC (transiting an SMS Router, if present).

Message Format

< MT-Forward-Short-Message-Answer > ::= < Diameter Header: 8388646, PXY, 16777313 >
< Session-Id >
[DRMP]
[Vendor-Specific-Application-Id]
[Result-Code]
[Experimental-Result]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
*[Supported-Features]
[Absent-User-Diagnostic-SM]
[SM-Delivery- Failure-Cause]
[SM-RP-UI]
[Requested-Retransmission-Time]
[User-Identifier]
*[AVP]
*[Failed-AVP]
*[Proxy-Info]
*[Route-Record]

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The maximum value of “Failed-AVP” is “1”.
- The MME doesn’t check the contents of “Proxy-Info”.
- The description hatched with gray is unsupported.

6.3.3 AVPs

[DOCOMO Compliance]

Compliance : Not Applicable

Comment :

- *[AVP] is hatched with light blue because of customization AVP.

6.3.3.1 General

The following table specifies the Diameter AVPs defined for the SGd/Gdd interface protocol, their AVP Code values, types, possible flag values and whether or not the AVP may be encrypted. The Vendor-ID header of all AVPs defined in this specification shall be set to 3GPP (10415).

For all AVPs which contain bit masks and are of the type Unsigned32, e.g., TFR-Flags, bit 0 shall be the least significant bit. For example, to get the value of bit 0, a bit mask of 0x0001 should be used.

Table 6.3.3.1/1: SGd/Gdd specific Diameter AVPs

				AVP Flag rules				
Attribute Name	**AVP Code**	**Section defined**	**Value Type**	**Must**	**May**	**Should not**	**Must not**	**May Encr.**
SC-Address	3300	6.3.3.2	OctetString	M, V				No
SM-RP-UI	3301	6.3.3.3	OctetString	M, V				No
TFR-Flags	3302	6.3.3.4	Unsigned32	M, V				No
SM-Delivery- Failure-Cause	3303	6.3.3.5	Grouped	M, V				No
SM-Enumerated-Delivery-Failure-Cause	3304	6.3.3.6	Enumerated	M, V				No
SM-Diagnostic-Info	3305	6.3.3.7	OctetString	M, V				No
SM-Delivery-Timer	3306	6.3.3.10	Unsigned32	M, V				No
SM-Delivery-Start-Time	3307	6.3.3.11	Time	M, V				No
SMSMI-Correlation-ID	3324	6.3.3.13	Grouped	V			M	No
HSS-ID	3325	6.3.3.14	OctetString	V			M	No
Originating-SIP-URI	3326	6.3.3.15	UTF8String	V			M	No
Destination-SIP-URI	3327	6.3.3.16	UTF8String	V			M	No
OFR-Flags	3328	6.3.3.12	Unsigned32	V			M	No
Maximum-Retransmission-Time	3330	6.3.3.17	Time	V			M	No
Requested-Retransmission-Time	3331	6.3.3.18	Time	V			M	No
SMS-GMSC-Address	3332	6.3.3.19	OctetString	V			M	No

NOTE 1: The AVP header bit denoted as "M", indicates whether support of the AVP is required. The AVP header bit denoted as "V" indicates whether the optional Vendor-ID field is present in the AVP header. For further details, see IETF RFC 3588 [4].

NOTE 2: If the M-bit is set for an AVP and the receiver does not understand the AVP, it shall return a rejection. If the M-bit is not set for an AVP, the receiver shall not return a rejection, whether or not it understands the AVP. If the receiver understands the AVP but the M-bit value does not match with the definition in this table, the receiver shall ignore the M-bit.

The following table specifies the Diameter AVPs re-used from existing Diameter Applications, including a reference to their respective specifications and when needed, a short description of their use within this interface.

Any other AVPs from existing Diameter Applications, except for the AVPs from Diameter Base Protocol, do not need to be supported. The AVPs from Diameter Base Protocol are not included in table 6.3.3.1/2, but they may be re-used for this interface.

Table 6.3.3.1/2: SGd/Gdd re-used Diameter AVPs

Attribute Name	Reference	Comments	M-bit
User-Name	IETF RFC 3588 [7]		Must
User-Identifier	3GPP TS 29.336 [15]		
MME-Number-for-MT-SMS	3GPP TS 29.272 [4]		
SGSN-Number	3GPP TS 29.272 [4]		Must not
Absent-User-Diagnostic-SM	3GPP TS 29.338	It is defined for the S6c interface, see subclause 5.3.3.20	
Supported-Features	3GPP TS 29.229 [5]		
Feature-List-ID	3GPP TS 29.229 [5]	See subclause 6.3.3.8	
Feature-List	3GPP TS 29.229 [5]	See subclause 6.3.3.9	
DRMP	IETF RFC 7944 [19]	see section 6.3.3.20	Must not set
External-Identifier	3GPP TS 29.336 [15]		Must not
NOTE 1: The M-bit settings for re-used AVPs override those of the defining specifications that are referenced. Values include: "Must set", "Must not set". If the M-bit setting is blank, then the defining specification applies. NOTE 2: If the M-bit is set for an AVP and the receiver does not understand the AVP, it shall return a rejection. If the M-bit is not set for an AVP, the receiver shall not return a rejection, whether or not it understands the AVP. If the receiver understands the AVP but the M-bit value does not match with the definition in this table, the receiver shall ignore the M-bit.			

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

6.3.3.2 SC-Address

The SC-Address AVP is of type UTF8String and it shall contain the E164 number of the SMS-SC or MTC-IWF, in international number format as described in ITU-T Recommendation E.164 [13].

[DOCOMO Compliance]

Compliance : Full Compliance

6.3.3.3 SM-RP-UI

The SM-RP-UI is of type OctetString and it shall contain a short message transfer protocol data unit (TPDU) which is defined in 3GPP TS 23.040 [3] and represents the user data field carried by the short message service relay sub-layer protocol. Its maximum length is of 200 octets.

[DOCOMO Compliance]

Compliance : Full Compliance

6.3.3.4 TFR-Flags

The TFR-Flags AVP is of type Unsigned32 and it shall contain a bit mask. The meaning of the bits shall be as defined in table 6.3.3.4/1:

Table 6.3.3.4/1: TFR-Flags

Bit	Name	Description
0	More-Messages-To-Send	This bit, when set, shall indicate that the service centre has more short messages to send.
NOTE 1: Bits not defined in this table shall be cleared by the sending entity and discarded by the receiving entity.		

[DOCOMO Compliance]

Compliance : Full Compliance

6.3.3.5 SM-Delivery-Failure-Cause

The SM-Delivery-Failure-Cause AVP is of type Grouped. It shall contain information about the cause of the failure of a SM delivery with an optional Diagnostic information.

The AVP format shall conform to:

SM-Delivery-Failure-Cause ::= <AVP header: 3304 10415>

{ SM-Enumerated-Delivery-Failure-Cause }

[SM-Diagnostic-Info]

*[AVP]

[DOCOMO Compliance]

Compliance : Full Compliance

6.3.3.6 SM-Enumerated-Delivery-Failure-Cause

The SM-Enumerated-Delivery-Failure-Cause AVP is of type enumerated and it shall contain the cause of the failure of a SM delivery. The following values are defined:

MEMORY_CAPACITY_EXCEEDED (0),

EQUIPMENT_PROTOCOL_ERROR (1),

EQUIPMENT_NOT_SM-EQUIPPED (2),

UNKNOWN_SERVICE_CENTRE (3),

SC-CONGESTION (4),

INVALID_SME-ADDRESS (5),

USER_NOT_SC-USER (6).

NOTE: The values of the SM- Enumerated-Delivery-Failure-Cause AVP correspond to the ones for the SM-EnumeratedDeliveryFailureCause parameter in MAP as described in 3GPP TS 29.002[9].

[DOCOMO Compliance]

Compliance : Partial Compliance

Comment :

- The description hatched with gray is unsupported.

6.3.3.7 SM-Diagnostic-Info

The SM-Diagnostic-Info AVP is of type OctetString and it shall contain a complementary information associated to the SM Delivery Failure cause.

[DOCOMO Compliance]

Compliance : Full Compliance

6.3.3.8 Feature-List-ID AVP

The syntax of this AVP is defined in 3GPP TS 29.229 [5]. For this release, the Feature-List-ID AVP value shall be set to 1.

[DOCOMO Compliance]

Compliance : Full Compliance

6.3.3.9 Feature-List AVP

The syntax of this AVP is defined in 3GPP TS 29.229 [5]. A null value indicates that there is no feature used by the application.

NOTE: There is no feature defined for this release.

[DOCOMO Compliance]

Compliance : Full Compliance

6.3.3.10 SM-Delivery-Timer

The SM-Delivery-Timer is of type Integer and it shall contain the value in seconds of the timer for SM Delivery.

[DOCOMO Compliance]

Compliance : Not Compliance

6.3.3.11 SM-Delivery-Start-Time

The SM-Delivery-Start-Time is of type Time and in shall contain the timestamp (in UTC) at which the SM Delivery Supervision Timer was started.

[DOCOMO Compliance]

Compliance : Not Compliance

6.3.3.12 OFR-Flags

The OFR-Flags AVP is of type Unsigned32 and it shall contain a bit mask. The meaning of the bits shall be as defined in table 6.3.3.12/1:

Table 6.3.3.12/1: OFR-Flags

Bit	Name	Description
0	S6a/S6d-Indicator	This bit, when set, indicates that the OFR message is sent on the Gdd interface, i.e. the source node is an SGSN (or a combined MME/SGSN to which the UE is attached via UTRAN). This bit, when cleared, indicates that the OFR message is sent on the SGd interface, i.e. the source node is an MME (or a combined MME/SGSN to which the UE is attached via UTRAN or GERAN).

[DOCOMO Compliance]

Compliance : Full Compliance

Comment :

- bit 0 is set to “0”

6.3.3.13 SMSMI-Correlation-ID

The SMSMI-Correlation-ID AVP is of type Grouped. It shall contain information identities used in the context of MSISDN-less SMS delivery in IMS (see 3GPP TS 23.204 [17]).

The AVP format shall conform to:

SMS-MI-Correlation-ID ::= <AVP header: 3308 10415>

[HSS-ID]

[Originating-SIP-URI]

[Destination-SIP-URI]

*[AVP]

[DOCOMO Compliance]

Compliance : Not Compliance

6.3.3.14 HSS-ID

The HSS-ID AVP is of typeUTF8String. The definition and the composition of the HSS-ID are specified in 3GPP TS 23.003 [16].

[DOCOMO Compliance]

Compliance : Not Compliance

6.3.3.15 Originating-SIP-URI

The Originating-SIP-URI AVP is of type UTF8String. It shall contain the Public identity of the IMS UE without MSISDN which is the sender of a short message, in the context of MSISDN-less SMS delivery in IMS (see 3GPP TS 23.204 [17]).

[DOCOMO Compliance]

Compliance : Not Compliance

6.3.3.16 Destination-SIP-URI

The Destination-SIP-URI AVP is of type UTF8String. It shall contain the Public identity of the IMS UE without MSISDN which is the recipient of a short message, in the context of MSISDN-less SMS delivery in IMS (see 3GPP TS 23.204 [17]).

[DOCOMO Compliance]

Compliance : Not Compliance

6.3.3.17 Maximum-Retransmission-Time

The Maximum-Retransmission-Time is of type Time and in shall contain the maximum retransmission time (in UTC) until which the SMS-GMSC is capable to retransmit the MT Short Message.

[DOCOMO Compliance]

Compliance : Not Compliance

6.3.3.18 Requested-Retransmission-Time

The Requested-Retransmission-Time is of type Time and in shall contain the timestamp (in UTC) at which the SMS-GMSC is requested to retransmit the MT Short Message.

[DOCOMO Compliance]

Compliance : Not Compliance

6.3.3.19 SMS-GMSC-Address

The SMS-GMSC-Address AVP is of type UTF8String and it shall contain the E.164 number of the SMS-GMSC or SMS Router, in international number format as described in ITU-T Recommendation E.164 [13].

[DOCOMO Compliance]

Compliance : Not Compliance

6.3.3.20 DRMP

The DRMP AVP is of type Enumerated and it is defined in IETF RFC 7944 [19]. This AVP allows the MME, the SGSN, the SMS-IWMSC, the SMS-GMSC, the SMS Router and the IP-SM-GW to indicate the relative priority of Diameter messages.

[DOCOMO Compliance]

Compliance : Not Compliance

7 Result Codes and Experimental-Result values

[DOCOMO Compliance]

Compliance : Not Applicable

7.1 General

This section defines result code values that shall be supported by all Diameter implementations that conform to this specification.

[DOCOMO Compliance]

Compliance : Full Compliance

7.2 Success

Result codes that fall within the Success category shall be used to inform a peer that a request has been successfully completed. The Result-Code AVP values defined in Diameter Base Protocol RFC 3588 [7] shall be applied.

[DOCOMO Compliance]

Compliance : Full Compliance

7.3 Permanent Failures

[DOCOMO Compliance]

Compliance : Not Applicable

7.3.1 General

Errors that fall within the Permanent Failures category shall be used to inform the peer that the request has failed, and should not be attempted again. The Result-Code AVP values defined in Diameter Base Protocol RFC 3588 [7] shall be applied. When one of the result codes defined here is included in a response, it shall be inside an Experimental-Result AVP and the Result-Code AVP shall be absent.

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.2 DIAMETER_ERROR_USER_UNKNOWN (5001)

This result code shall be sent by the MME over the SGd interface or by the SGSN over the Gdd interface to indicate that the user identified by the IMSI is unknown.

This result code shall be sent by the SMS-IWMSC over the SGd interface to indicate that the user identified by the MSISDN is unknown.

This result code shall be sent by the HSS or the SMS Router over the S6c interface to indicate that the user identified by the MSISDN is unknown.

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.3 DIAMETER_ERROR_ABSENT_USER (5550)

This result code shall be sent by the MME over the SGd interface or by the SGSN over the Gdd interface to indicate that the UE is not reachable.

This result code shall be sent by the HSS or the SMS Router over the S6c interface to indicate that the UE is not reachable.

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.4 DIAMETER_ERROR_USER_BUSY_FOR_MT_SMS (5551)

This result code shall be sent by the MME or the SGSN when the user is busy for MT SMS.

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.5 DIAMETER_ERROR_FACILITY_NOT_SUPPORTED (5552)

This result code shall be sent to indicate a requested facility is not supported.

NOTE: This code corresponds to the Facility Not Supported MAP error and may be used by an IWF.

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.6 DIAMETER_ERROR_ILLEGAL_USER (5553)

This result code shall be sent by the MME or the SGSN to indicate that the delivery of the mobile terminated short message failed because the mobile station failed authentication.

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.7 DIAMETER_ERROR_ILLEGAL_EQUIPMENT (5554)

This result code shall be sent by the MME or the SGSN to indicate that the delivery of the mobile terminated short message failed because an IMEI check failed, i.e. the IMEI was blacklisted or not white-listed.

[DOCOMO Compliance]

Compliance : Not Compliance

7.3.8 DIAMETER_ERROR_SM_DELIVERY_FAILURE (5555)

This result code shall be sent by the MME or the SGSN or the SMS-IWMSC to indicate that the delivery of the mobile terminated short message failed.

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.9 DIAMETER_ERROR_SERVICE_NOT_SUBSCRIBED (5556)

This result code shall be sent by the HSS or the SMS Router over the S6c interface to indicate that the MT SMS Teleservice is not part of the subscription.

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.10 DIAMETER_ERROR_SERVICE_BARRED (5557)

This result code shall be sent by the HSS or the SMS Router over the S6c interface to indicate that the MT SMS Teleservice is barred.

This result code shall be sent by the MME to indicate that the delivery of the mobile terminated short message failed because of the barring of the SMS service.

[DOCOMO Compliance]

Compliance : Full Compliance

7.3.11 DIAMETER_ERROR_MWD_LIST_FULL (5558)

This result code shall be sent by the HSS over the S6c interface to indicate that the Message Waiting List is full.

[DOCOMO Compliance]

Compliance : Not Applicable

7.4 Transient Failures

[DOCOMO Compliance]

Compliance : Not Applicable

7.4.1 General

Result codes that fall within the transient failures category shall be used to inform a peer that the request could not be satisfied at the time it was received, but may be able to satisfy the request in the future. The Result-Code AVP values defined in Diameter Base Protocol RFC 3588 [7] shall be applied.

[DOCOMO Compliance]

Compliance : Not Compliance

Annex A (normative): Diameter message priority mechanism

[DOCOMO Compliance]

Compliance : Not Applicable

A.1 General

IETF RFC 7944 [19] specifies a Diameter routing message priority mechanism that allows Diameter nodes to indicate the relative priority of Diameter messages. With this information, other Diameter nodes may leverage the relative priority of Diameter messages into routing, resource allocation and also abatement decisions when overload control is applied.

[DOCOMO Compliance]

Compliance : Not Compliance

A.2 S6c, SGd, Gdd interfaces

The Diameter message priority mechanism is an optional feature which may apply on one or several of the S6c,SGd,Gdd interfaces.

A 3GPP functional entity supporting the Diameter message priority mechanism over one or several of the S6c,SGd,Gdd interfaces shall comply with IETF RFC 7944 [19]. In particular, when priority is required, it shall include the DRMP AVP indicating a priority level in the requests it sends, and prioritise received requests according to the priority level received within the DRMP AVP. It shall prioritise received answers according to the priority level received within the DRMP AVP if present, otherwise according to the priority level of the corresponding request. It shall include the DRMP AVP in the answer to a received request if the required priority of the answer is different from the one of the request. The decisions of the 3GPP functional entity for a required priority and for the priority level value are implementation specific.

Diameter requests related to high priority traffic should contain a DRMP AVP with a high priority of which the level value is operator dependent.

[DOCOMO Compliance]

Compliance : Not Compliance

Annex B (informative): Change history

[DOCOMO Compliance]

Compliance : Not Applicable

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
2012	CT#58	CP-120762			TS sent for approval	2.0.0	11.0.0
2013-03	CT#59	CP-130030	0003	2	Validity Time of Short Message	11.0.0	12.0.0
2013-06	CT#60	CP-130300	0001	2	Diameter for SMS with SGSN General	12.0.0	12.1.0
		CP-130300	0002	2	Diameter for SMS with SGSN Complements		
		CP-130300	0004	1	S6c complements related to Diameter for SMS with SGSN		
2013-09	CT#61	CP-130450	0007	1	Correction on Routing for MO SM	12.1.0	12.2.0
		CP-130456	0008	2	SGSN Diameter address with Gdd support		
2013-12	CT#62	CP-130800	0009	3	Diameter based protocols with SMS for IMS UE without MSISDN	12.2.0	12.3.0
2014-09	CT#65	CP-140513	0010	2	Identification of the HSS	12.3.0	12.4.0
2014-12	CT#66	CP-140767	0013	1	Corrections for some AVPs	12.4.0	12.5.0
			0011	1	SC-Address in SRR		
			0014	-	AVP codes corrections for SMSMI		
			0016		OFR-Flags AVP correction		
2015-12	CT#70	CP-150776	0017	3	Mobile Terminating SMS handling for extended Idle mode DRX	12.5.0	13.0.0
			0018	1	Mobile Terminating SMS handling for extended Idle mode DRX – Additional Option		
2016-03	CT#71	CP-160030	0019	-	Alert procedure from MME/SGSN to SMS-GMSC for MT SMS to UE using eDRX	13.0.0	13.1.0
		CP-160023	0020	1	Diameter message priority over S6c, SGd, Gdd		
2016-06	CT#72	CP-160226	0021	-	Missing Requested-Retransmission-Time AVP in TFA Command	13.1.0	13.2.0
2016-12	CT#74	CP-160664	0023		Correction to change IETF drmp draft version to official RFC 7944	13.2.0	13.3.0
2016-12	CT#74	CP-160673	0022	1	MO SMS over T4	13.3.0	14.0.0