3GPP TSG CN Meeting #27 **NP-050109**
9th - 11th March 2005. Tokyo, Japan.

Source: **CN3**

Title: **CRs to Rel-6 on Work Item "Gx interface for Flow Based Charging"**

Agenda item: **9.22**

Document for: **APPROVAL**

Introduction:

This document contains 6 CRs to Rel-6 on Work Item "CH-FBC" that have been agreed by TSG CN WG3, and are forwarded to TSG CN Plenary for approval.

WG_tdoc	Spec	CR	R	Cat	Title	Rel	C_Ver	Work Item
N3-050219	29.210	001	3	F	Extend the Rule Name uniqueness to the whole system	Rel-6	6.0.0	CH-FBC
N3-050222	29.210	003	2	F	Clarification on the use of the application-ids on NOT_APPLICABLE notifications	Rel-6	6.0.0	CH-FBC
N3-050174	29.210	005	1	F	Clarifications for Indication of Bearer Termination	Rel-6	6.0.0	CH-FBC
N3-050226	29.210	006	3	F	TFT filter clarifications	Rel-6	6.0.0	CH-FBC
N3-050209	29.210	007	2	F	Correction of AF Definition	Rel-6	6,0,0	CH-FBC
N3-050221	29.210	009	2	F	RAT Type AVP definition	Rel-6	6.0.0	CH-FBC

3GPP TSG-CN WG3 Meeting #34 ***Tdoc ⌘N3-050174***

Sydney, Australia. 14th - 18th February 2005.

CR-Form-v7.1

CHANGE REQUEST

⌘ **29.210** **CR** **5** ⌘ **rev** **1** ⌘ Current version: **6.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Indication of Bearer Termination
Source:	⌘	Siemens
Work item code:	⌘	CH-FBC
Date:	⌘	07/02/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
Ph2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)
Rel-7 (Release 7)

Reason for change:	⌘	Unclear how bearer termination is signalled.
Summary of change:	⌘	The Diameter (sub)session corresponding to the terminated bearer is being terminated with a Diameter CCR with request type TERMINATION_REQUEST.
Consequences if not approved:	⌘	Incompatible implementaions of bearer terminations signalling may be encountered

Clauses affected:	⌘	4.3.6

Other specs affected: ⌘	Y	N		⌘
		X	Other core specifications	
		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘

4.3.6 Indication of bearer termination (from TPF to CRF)

The TPF indicates to the CRF, via the Gx reference point, that a bearer is terminated via the release of the corresponding DCC (sub)session. TheTPF shall send a CC-Request with CC-Request-Type AVP set to the value TERMINATION_REQUEST. The bearer termination indication identifies the bearer being removed by the usage of the corresponding DCC (sub)session.

3GPP TSG-CN WG3 Meeting #35 **N3-050222**
Sydney, Australia. 14th – 18th Februrary 2005.

CR-Form-v7

CHANGE REQUEST

⌘ **29.210** **CR** **003** ⌘ **rev** **2** ⌘ Current version: **6.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Missing description of the behaviour of the application-ids on NOT_APPLICABLE notifications
Source:	⌘	Nortel
Work item code:	⌘	CH-FBC
Date:	⌘	18/2/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*
Rel-7	*(Release 7)*

Reason for change:	⌘	According to 32.299, the Gy server can decide that no further credit control is needed, for example in the event of a free of charge service, and indicate it so to the cliet with a Result-Code of DIAMETER_CREDIT_CONTROL_NOT_APPLICABLE. This effectively means that the Gy capabilities will not be further used during the session, however the session was started with a negotiated Gx over Gy Application-id, and this must be manteined.
Summary of change:	⌘	The behaviour in the event of a (Gy) DCC_Not_Applicable happens in a Gx Over Gy session is added.
Consequences if not approved:	⌘	Behaviour not specified that can lead to different implementations and interoperability problems.

Clauses affected:	⌘	6.2

Other specs affected: ⌘	Y	N		⌘
		X	Other core specifications	
		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

********** FIRST MODIFIED CLAUSE **********

6.2 Gx over Gy Application

The Gy protocol is specified as online charging application in in 3GPP TS 32.299 [9] and TS 32.251 [13]

The Gx over Gy Application allows to combine in a single message exchange (e.g. CCR-CCA) the Gx functionality of charging rule provisioning, and the Gy functionality of credit control for service data flow based online charging. This allows creating synergies and signalling savings in case the CRF and the OCS are collocated.

The Diameter Gx over Gy Application as described in this Clause should be used when the CRF functionality is co-located with the Online Charging System (OCS) and both are connected to the TPF via a single interface that comprises the Gx and Gy reference points. The Auth-Application-Id for the Gx over Gy Application is xxx as allocated by IANA.

Editor's note: The application id needs to be allocated from IANA.

A Gx over Gy Application specific Auth-Application-Id is used together with the command code to identify the Gx over Gy Application messages.

The Gx over Gy Application is based on the Diameter Credit Control Application. The Gx over Gy Application shall use Gx specific AVPs to fulfil the Gx specific requirements (charging rule provision) and, over the same message, Gy functionalities (credit authorization), as follows:

- When only charging rule provision is required the procedures and message content for Gx Application as specified in clause 6.1 shall apply.
- When only credit authorization is required the procedures and message content for Gy as specified as online charging application in 3GPP TS 32.299 [9] and TS 32.251 [13] shall apply.
- When credit authorization and charging rule provision are required simultaneously, these should be requested and provided with a single CCR-CCA message pair (e.g. credit authorization and request for charging rules). The AVPs defined in Gy interface to satisfy the credit authorization requirements and the Gx specific and Gx re-used AVPs shall be both included in the Diameter messages as needed. The common AVPs shall be included only once within the same message.

If during a Gx over Gy session, the Gy server indicates DIAMETER_CREDIT_CONTROL_NOT_APPLICABLE as defined in 3GPP TS 32.299 [9], then the session shall be maintained using the original Gx over Gy Application-id, i.e. shall not switch over to the Gx Application-id.

The Experimental-Result-Code AVP specific values of both the Gy protocol and Gx protocol apply for the Gx over Gy application.

All AVPs mandated for the Gx protocol or for the Gy protocol are also mandated for the Gx over Gy application.

Both the procedures defined for the Gx protocol and the procedures defined for the Gy protocol shall be applied for the Gx over Gy application as clarified in the subsequent Clause.

********* END OF MODIFIED CLAUSES **********

3GPP TSG-CN WG3 Meeting #35 **Tdoc ⌘N-050221**
Sydney, Australia. 14th - 18th February 2005.

CR-Form-v7.1

CHANGE REQUEST

⌘ **29.210** **CR** **9** ⌘**rev** **2** ⌘ Current version: **6.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	RAT-Type AVP definition
Source:	⌘	Vodafone
Work item code:	⌘	CH-FBC
Date:	⌘	16/02/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
Ph2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
Rel-4 *(Release 4)*
Rel-5 *(Release 5)*
Rel-6 *(Release 6)*
Rel-7 *(Release 7)*

Reason for change:	⌘	The RAT-Type AVP was defined for the Gx interface in TS 29.210 before the corresponding RADIUS attribute had been defined in TS 29.061. Though it seems reasonable to align the definition of the RAT Type AVP with the usual procedure used for the definition of an AVP when the corresponding RADIUS attribute is available, that is according to the rule defined in draft-ietf-aaa-diameter-nasreq-17.txt.
Summary of change:	⌘	RAT-Type AVP is defined simply translating the corresponding 3GPP RADIUS VSA according to the rule described in draft-ietf-aaa-diameter-nasreq-17.txt.
Consequences if not approved:	⌘	Misalignment with the procedure normally used for the definition of an AVP when the corresponding RADIUS attribute is available.

Clauses affected:	⌘	5.2, 5.2.14, 5.3, 6.1.1

Other specs affected: ⌘	Y	N		⌘
		X	Other core specifications	
		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘

How to create CRs using this form:
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Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

********** FIRST MODIFIED SECTION **********

5.2 Gx specific AVPs

Table 5.2 describes the Diameter AVPs defined for the Gx reference point, 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 the present document shall be set to 3GPP (10415).

Table 5.2: Gx specific Diameter AVPs

				AVP Flag rules (note 1)				
Attribute Name	**AVP Code**	**Clause defined**	**Value Type (note 2)**	**Must**	**May**	**Should not**	**Must not**	**May Encr.**
Bearer-Usage	1000	5.2.1	Enumerated	M,V	P			Y
Charging-Rule-Install	1001	5.2.2	Grouped	M,V	P			Y
Charging-Rule-Remove	1002	5.2.3	Grouped	M,V	P			Y
Charging-Rule-Definition	1003	5.2.4	Grouped	M,V	P			Y
Charging-Rule-Base-Name	1004	5.2.5	OctetString	M,V	P			Y
Charging-Rule-Name	1005	5.2.6	OctetString	M,V	P			Y
Event-Trigger	1006	5.2.7	Enumerated	M,V	P			Y
Metering-Method	1007	5.2.8	Enumerated	M,V	P			Y
Offline	1008	5.2.9	Enumerated	M,V	P			Y
Online	1009	5.2.10	Enumerated	M,V	P			Y
Precedence	1010	5.2.11	Unsigned32	M,V	P			Y
Primary-CCF-Address	1011	5.2.12	DiameterURI	M,V	P			Y
Primary-OCS-Address	1012	5.2.13	DiameterURI	M,V	P			Y
~~RAT-Type~~	~~1013~~	~~5.2.14~~	~~Enumerated~~	~~M,V~~	~~P~~			~~Y~~
Reporting-Level	1014	5.2.15	Enumerated	M,V	P			Y
Secondary-CCF-Address	1015	5.2.16	DiameterURI	M,V	P			Y
Secondary-OCS-Address	1016	5.2.17	DiameterURI	M,V	P			Y
TFT-Filter	1017	5.2.18	IPFilterRule	M,V	P			Y
TFT-Packet-Filter-Information	1018	5.2.19	Grouped	M,V	P			Y
ToS-Traffic-Class	1019	5.2.20	OctetString	M,V	P			Y

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 RFC 3588 [4].
NOTE 2: The value types are defined in RFC 3588 [4].

5.2.1 Bearer-Usage AVP

The Bearer-Usage AVP (AVP code 1000) is of type Enumerated, and it shall indicate how the bearer is being used. If the Bearer-Usage AVP has not been previously provided, its absence shall indicate that no specific information is available. If the Bearer-Usage AVP has been provided, its value shall remain valid until it is provided the next time. The following values are defined:

GENERAL (0)

This value shall indicate no specific bearer usage information is available.

IMS_SIGNALLING (1)

This value shall indicate that the bearer is used for IMS signalling only.

5.2.2 Charging-Rule-Install AVP

The Charging-Rule-Install AVP (AVP code 1001) is of type Grouped, and it is used for installing or modifying charging rules for a bearer session as instructed from the CRF to the TPF. Charging-Rule-Name AVP is a reference for activating a specific charging rule predefined at the TPF. The Charging-Rule-Base-Name AVP is a reference for

activating a group of charging rules predefined at the TPF. The Charging-Rule-Definition AVP is used for installing or modifying charging rules provisioned over the Gx interface.

AVP Format:

```
Charging-Rule-Install ::= < AVP Header: 1001 >
                          *[ Charging-Rule-Definition ]
                          *[ Charging-Rule-Name ]
                          *[ Charging-Rule-Base-Name ]
                          *[ AVP ]
```

5.2.3 Charging-Rule-Remove AVP

The Charging-Rule-Remove AVP (AVP code 1002) is of type Grouped, and it is used for removing charging rules from a bearer session. Charging-Rule-Name AVP is a reference for a specific charging rule at the TPF to be removed or for a specific charging rule predefined at the TPF to be deactivated.. The Charging-Rule-Base-Name AVP is a reference for a group of charging rules predefined at the TPF to be deactivated.

AVP Format:

```
Charging-Rule-Remove ::= < AVP Header: 1002 >
                          *[ Charging-Rule-Name ]
                          *[ Charging-Rule-Base-Name ]
                          *[ AVP ]
```

5.2.4 Charging-Rule-Definition AVP

The Charging-Rule-Definition AVP (AVP code 1003) is of type Grouped, and it defines the charging rule for a service flow sent by the CRF to the TPF. The Charging-Rule-Name AVP uniquely identifies the charging rule within the bearer session and it is used to reference to a charging rule in communication between the TPF and the CRF. The Flow-Description AVP(s) determines the traffic that belongs to the service flow.

If optional AVP(s) within a Charging-Rule-Definition AVP are omitted, but corresponding information has been provided in previous Gx messages, the previous information remains valid. If Flow-Description AVP(s) are supplied, they replace all previous Flow-Description AVP(s). If Flows AVP(s) are supplied, they replace all previous Flows AVP(s),

AVP Format:

```
Charging-Rule-Definition ::= < AVP Header: 1003 >
                             { Charging-Rule-Name }
                             [ Service-Identifier ]
                             [ Rating-Group ]
                            *[ Flow-Description ]
                             [ Reporting-Level ]
                             [ Online ]
                             [ Offline ]
                             [ Metering-Method ]
                             [ Precedence ]
                             [ AF-Charging-Identifier ]
                            *[ Flows ]
                            *[ AVP ]
```

5.2.5 Charging-Rule-Base-Name AVP

The Charging-Rule-Base-Name AVP (AVP code 1004) is of type OctetString, and it indicates the name of a pre-defined group of charging rules residing at the TPF.

5.2.6 Charging-Rule-Name AVP

The Charging-Rule-Name AVP (AVP code 1005) is of type OctetString, and it uniquely identifies a charging rule within the bearer session.

5.2.7 Event-Trigger AVP

The Event-Trigger AVP (AVP code 1006) is of type Enumerated, and it indicates an event that shall cause a re-request of charging rules. The following values are defined:

SGSN_CHANGE (0)

This value shall be used to indicate that upon the change of the serving SGSN charging rules shall be requested.

QOS_CHANGE (1)

This value shall be used to indicate that the upon QoS change charging rules shall be requested.

RAT_CHANGE (2)

This value shall be used to indicate that the upon RAT change charging rules shall be requested.

TFT_CHANGE (3)

This value shall be used to indicate that the upon TFT change charging rules shall be requested.

5.2.8 Metering-Method AVP

The Metering-Method AVP (AVP code 1007) is of type Enumerated, and it defines what parameters shall be metered for offline charging. The following values are defined:

DURATION (0)

This value shall be used to indicate that the duration of the service flow shall be metered.

VOLUME (1)

This value shall be used to indicate that volume of the service flow traffic shall be metered.

DURATION_VOLUME (2)

This value shall be used to indicate that the duration and the volume of the service flow traffic shall be metered.

5.2.9 Offline AVP

The Offline AVP (AVP code 1008) is of type Enumerated, and it defines whether the offline charging interface from the TPF for the associated charging rule shall be enabled. The absence of this AVP indicates that the default configuration shall be used. The following values are defined:

DISABLE_OFFLINE (0)

This value shall be used to indicate that the offline charging interface for the associated charging rule shall be disabled.

ENABLE_OFFLINE (1)

This value shall be used to indicate that the offline charging interface for the associated charging rule shall be enabled.

5.2.10 Online AVP

The Online AVP (AVP code 1009) is of type Enumerated, and it defines whether the online charging interface from the TPF for the associated charging rule shall be enabled. The absence of this AVP indicates that the default configuration shall be used. The following values are defined:

DISABLE_ONLINE (0)

This value shall be used to indicate that the online charging interface for the associated charging rule shall be disabled.

ENABLE_ONLINE (1)

This value shall be used to indicate that the online charging interface for the associated charging rule shall be enabled.

5.2.11 Precedence AVP

The Precedence AVP (AVP code 1010) is of type Unsigned32, and it defines the precedence of a charging rule in case of overlapping charging rules. A charging rule with the Precedence AVP with lower value shall take the priority over a charging rule with the Precedence AVP with higher value. The Precedence AVP is also used to indicate the evaluation precedence of the TFT packet filters.

5.2.12 Primary-CCF-Address AVP

The Primary-CCF-Address AVP (AVP code 1011) is of type DiameterURI, and it defines the address of the primary offline charging system for the bearer. The absence of the protocol definition in the DiameterURI shall indicate the default protocol defined for the Gz interface.

5.2.13 Primary-OCS-Address AVP

The Primary-OCS-Address AVP (AVP code 1012) is of type DiameterURI, and it defines the address of the primary online charging system for the bearer. The absence of the protocol definition in the DiameterURI shall indicate the default protocol defined for the Gy interface.

5.2.14 Void ~~RAT-Type AVP~~

~~The RAT-Type AVP (AVP code 1013) is of type Enumerated, and it defines the radio access technology type of the bearer sent from the TPF to the CRF. The CRF may use this information for charging rule decision. The following values are defined:~~

~~UTRAN (1)~~

~~This value shall be used to indicate that UTRAN is used.~~

~~GERAN (2)~~

~~This value shall be used to indicate that GERAN is used.~~

~~WLAN (3)~~

~~This value shall be used to indicate that WLAN is used.~~

5.2.15 Reporting-Level AVP

The Reporting-Level AVP (AVP code 1014) is of type Enumerated, and it defines on what level the TPF reports the usage for the related charging rule. The following values are defined:

CHARGING_RULE_LEVEL (0)

This value shall be used to indicate that the usage shall be reported on charging rule level.

RATING_GROUP_LEVEL (1)

This value shall be used to indicate that the usage shall be reported on rating group level.

5.2.16 Secondary-CCF-Address AVP

The Secondary-CCF-Address AVP (AVP code 1015) is of type DiameterURI, and it defines the address of the secondary offline charging system for the bearer. The absence of the protocol definition in the DiameterURI shall indicate the default protocol defined for the Gz interface.

5.2.17 Secondary-OCS-Address AVP

The Secondary-OCS-Address AVP (AVP code 1016) is of type DiameterURI, and it defines the address of the secondary online charging system for the bearer. The absence of the protocol definition in the DiameterURI shall indicate the default protocol defined for the Gy interface.

5.2.18 TFT-Filter AVP

The TFT-Filter AVP (AVP code 1017) is of type IPFilterRule, and it contains the flow filter for one TFT packet filter. The TFT-Filter AVP is derived from the Traffic Flow Template (TFT) defined in 3GPP TS 24.008 [14]. The following information shall be sent:

- Source IP address (possibly masked).
- Source and destination port (list or ranges)

The IPFilterRule type shall be used with the following restrictions:

- Action shall be to "permit"
- Direction shall be set to "in"
- No options shall be used
- Destination IP address shall be wildcarded

The direction "in" refers to uplink direction in order to define the source and destination addresses and ports unambiguously.

5.2.19 TFT-Packet-Filter-Information AVP

The TFT-Packet-Filter-Information AVP (AVP code 1018) is of type Grouped, and it contains the information from a single TFT packet filter including the evaluation precedence, the filter and the Type-of-Service/Traffic Class sent from the TPF to the CRF. The TPF shall include all the TFT packet filters in separate TFT-Packet-Filter-Information AVPs to the charging rule request. TFT-Packet-Filter-Information AVPs are derived from the Traffic Flow Template (TFT) defined in 3GPP TS 24.008 [14]. When SBLP is used the packet filters shall be omitted.

AVP Format:

```
TFT-Packet-Filter-Information ::= < AVP Header: 1018 >
                            [ Precedence ]
                            [ TFT-Filter ]
                            [ ToS-Traffic-Class ]
```

5.2.20 ToS-Traffic-Class AVP

The ToS-Traffic-Class AVP (AVP code 1019) is of type OctetString, and it contains the Type-of-Service/Traffic-Class of a TFT packet filter as defined in 3GPP TS 24.008 [14].

5.3 Gx re-used AVPs

The table 5.3 lists the Diameter AVPs re-used by the Gx reference point from existing Diameter Applications, reference to their respective specifications and short description of their usage within the Gx reference point. 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, but they are re-used for the Gx reference point. Where 3GPP Radius VSAs are re-used, they shall be translated to Diameter AVPs as described in draft-ietf-aaa-diameter-nasreq-17.txt [12] with the exception that the 'M' flag shall be set and the "P' flag may be set.

Table 5.3: Gx re-used Diameter AVPs

Attribute Name	Reference	Description
3GPP-GPRS-Negotiated-QoS-Profile	3GPP TS 29.061 [11]	For GPRS the QoS of the PDP context
3GPP-SGSN-Address	3GPP TS 29.061 [11]	For GPRS the IPv4 address of the SGSN
3GPP-SGSN-IPv6-Address	3GPP TS 29.061 [11]	For GPRS the IPv6 address of the SGSN
3GPP-SGSN-MCC-MNC	3GPP TS 29.061 [11]	For GPRS the MCC and the MNC of the SGSN
AF-Charging-Identifier	3GPP TS 29.209 [10]	The AF charging identifier that may be used in charging correlation. For IMS the ICID.
Called-Station-ID	draft-ietf-aaa-diameter-nasreq-17.txt [12]	The address the user is connected to. For GPRS the APN.
CC-Request-Number	draft-ietf-aaa-diameter-cc-06.txt [8]	The number of the request for mapping requests and answers
CC-Request-Type	draft-ietf-aaa-diameter-cc-06.txt [8]	The type of the request (initial, update, termination)
CC-Sub-Session-Id	draft-ietf-aaa-diameter-cc-06.txt [8]	For GPRS each PDP context maps to a CC-Sub-Session-Id as specified in clause 6.
Flow-Description	3GPP TS 29.209 [10]	Defines the service flow filter parameters for a charging rule
Flows	3GPP TS 29.209 [10]	The flow identifiers of the IP flows related to a charging rule as provided by the AF. May be used in charging correlation together with AF-Charging-Identifier AVP.
Framed-IP-Address	draft-ietf-aaa-diameter-nasreq-17.txt [12]	The IPv4 address allocated for the user.
Framed-IPv6-Prefix	draft-ietf-aaa-diameter-nasreq-17.txt [12]	The IPv6 address prefix allocated for the user
Rating-Group	draft-ietf-aaa-diameter-cc-06.txt [8]	The charging key for the charging rule used for rating purposes
Service-Identifier	draft-ietf-aaa-diameter-cc-06.txt [8]	The identity of the service or service component the service data flow in a charging rule relates to.
Subscription-Id	draft-ietf-aaa-diameter-cc-06.txt [8]	The identification of the subscription (IMSI, MSISDN, etc)
User-Equipment-Info	draft-ietf-aaa-diameter-cc-06.txt [8]	The identification and capabilities of the terminal (IMEISV, etc.)
3GPP-RAT-Type	3GPP TS 29.061 [11]	Indicate which Radio Access Technology is currently serving the UE.

********** NEXT MODIFIED SECTION **********

6.1.1 CC-Request (CCR) Command

The CCR command, indicated by the Command-Code field set to xxx (IETF suggested value 272) and the 'R' bit set in the Command Flags field, is sent by the TPF to the CRF in order to request charging rules for a bearer. The CCR command is also sent by the TPF to the CRF in order to indicate the termination of the bearer session.

Message Format:

```
<CC-Request> ::= < Diameter Header: xxx (272), REQ, PXY >
                 < Session-Id >
                 { Auth-Application-Id }
                 { Origin-Host }
                 { Origin-Realm }
                 { Destination-Realm }
                 { CC-Request-Type }
                 { CC-Request-Number }
                 [ Destination-Host ]
                 [ CC-Sub-Session-Id ]
                 [ Origin-State-Id ]
```

```
                *[ Subscription-Id ]
                 [ Framed-IP-Address ]
                 [ Framed-IPv6-Prefix ]
                 [ RAT-Type ]
                 [ 3GPP-RAT-Type ]
                 [ Termination-Cause ]
                 [ User-Equipment-Info ]
                 [ 3GPP-GPRS-Negotiated-QoS-Profile ]
                 [ 3GPP-SGSN-MCC-MNC ]
                 [ 3GPP-SGSN-Address ]
                 [ 3GPP-SGSN-IPv6-Address ]
                 [ Called-Station-ID ]
                 [ Bearer-Usage ]
                *[ TFT-Packet-Filter-Information ]
                *[ Proxy-Info ]
                *[ Route-Record ]
                *[ AVP ]
```

3GPP TSG-CN WG3 Meeting #35 **N3-050219**
Sydney, Australia. 14th – 18th Februrary 2005.

CR-Form-v7.1

CHANGE REQUEST

⌘ **29.210** **CR** **001** ⌘ **rev** **3** ⌘ Current version: **6.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Extend the Rule Name uniqueness to the TPF for static rules
Source:	⌘	Nortel
Work item code:	⌘	CH-FBC
Date:	⌘	18/02/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*
Rel-7	*(Release 7)*

Reason for change:	⌘	The dynamically configured charging rules from the CRF, need to a have Charging-Rule-Name value unique for a bearer session, however the statically configuerd rules need to have a value unique for the whole system as they normally live longer that the bearers.
Summary of change:	⌘	Correction to the uniqueness of the Charging-Rule-Name AVP values, separating the case of dynamically and statically configured charging rule.
Consequences if not approved:	⌘	Wrong specification of the uniqueness of the charging rule name. The statically defined rules in the TPF need to be unique within the system, and not only within a bearer session.

Clauses affected:	⌘	5.2.6

		Y	N		
Other specs affected:	⌘		X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	

Other comments: ⌘

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

********** FIRST CHANGE **********

5.2.6 Charging-Rule-Name AVP

The Charging-Rule-Name AVP (AVP code 1005) is of type OctetString. , ~~and i~~ For charging rules provided by the CRF it uniquely identifies a charging rule within the bearer session. For charging rules pre-defined at the TPF it uniquely identifies a charging rule within the TPF.

***** END OF CHANGES ********

3GPP TSG-CN WG3 Meeting #34 ***Tdoc ⌘N3-040209***

Sydney, Australia. 14th - 18th February 2005.

CR-Form-v7.1

CHANGE REQUEST

⌘ **29.210** **CR** **007** ⌘**rev** **2** ⌘ Current version: **6.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Correction of AF and Bearer Session Definitions
Source:	⌘	Siemens, Lucent
Work item code:	⌘	CH-FBC
Date:	⌘	17/02/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

Ph2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*
Rel-7	*(Release 7)*

Reason for change:	⌘	AF definitions states that the AF is capable of communicating with the TPF, rather than the CRF. Term bearer session is frequentley used but not defined. Reference to TS 29.211, where FBC related call flows are provided, is missing
Summary of change:	⌘	Corrected definition of AF. References to bearer session deleted. Added Reference to 29.211 and mentioned call flows in this TS in scope.
Consequences if not approved:	⌘	Unclear terminology may lead to misinterpretation of specification.

Clauses affected:	⌘	1,2,3.1,4.3.3,5.2.2,5.2.3,5.2.4,5.2.6,6.1.1

Other specs affected: ⌘	Y	N		⌘
		X	Other core specifications	
		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘

1 Scope

The present document provides the stage 3 specification of the Gx reference point. The functional requirements and the stage 2 specifications of the Gx reference point are contained in 3GPP TS 23.125 [3]. The Gx reference point is for provisioning service data flow based charging rules between the Traffic Plane Function (TPF) and the Charging Rules Function (CRF), also known as Service Data Flow Based Charging Rules Function.

The present document defines:

- the protocol to be used between TPF and CRF over the Gx reference point;
- the information to be exchanged between TPF and CRF over the Gx reference point.

Whenever it is possible the present document specifies the requirements for this protocol by reference to specifications produced by the IETF within the scope of Diameter. Where this is not possible, extensions to Diameter are defined within the present document.

3GPP TS 29.211 [15] provides callflows for Flow Based Charging, covering the signalling on the Gx reference point.

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 23.002: "Network architecture".

[3] 3GPP TS 23.125: "Overall high level functionality and architecture impacts of flow based charging; Stage 2".

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

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

[6] 3GPP TS 33.210: "3G security; Network Domain Security (NDS); IP network layer security".

[7] 3GPP TS 29.207: "Policy control over Go interface".

[8] draft-ietf-aaa-diameter-cc-06.txt: "Diameter Credit-Control Application".

[9] 3GPP TS 32.299: "Telecommunication management; Charging management; Diameter charging applications".

[10] 3GPP TS 29.209: "Policy control over Gq interface".

[11] 3GPP TS 29.061: "Interworking between the Public Land Mobile Network (PLMN) supporting packet based services and Packet Data Networks (PDN)".

[12] draft-ietf-aaa-diameter-nasreq-17.txt: "Diameter Network Access Server Application", work in progress.

[13] 3GPP TS 32.251: "Packet Switched (PS) domain charging".

[14] 3GPP TS 24.008: "Mobile radio interface Layer 3 specification; Core network protocols; Stage 3".

[15] 3GPP TS 29.211: "Rx Interface and Rx/Gx signalling flows".

Next modified Clause

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1], in 3GPP TS 23.125 [3] and the following apply:

Application Function (AF): element offering applications ~~using~~ that use IP bearer resources.
The AF is capable of communicating with the ~~TPF~~ CRF to transfer dynamic charging rules related service information.
One example of an AF is the P-CSCF of the IM CN subsystem.

Attribute-Value Pair: See IETF RFC 3588 [4], corresponds to an Information Element in a Diameter message.

PDP Session: unique association of a subscriber with a network access service given by the combination of MSISDN, APN and IP address. A PDP session can consist of one or more PDP contexts (one primary and zero or more secondary)

Next modified Clause

4.3.3 Provision of charging rules from the CRF

The CRF shall indicate, via the Gx reference point, charging rules to be applied at the TPF. This may be:

- in response to a request for charging rules., i.e. to a request made as described in the preceding section; or
- unsolicited by the TPF, e.g. in response to information provided to the CRF via the Rx or Ry reference points, or in response to an internal trigger within the CRF.

For each request from the TPF and upon the unsolicited provision the CRF shall provision zero or more charging rules. The CRF may provide a single charging rule by one of the following means:

- Reference to a charging rule predefined at the TPF and the required action, i.e. activation or deactivation of charging rule, or
- Reference to a charging rule previously provided by the CRF to the TPF and the required action and possibly modified information, e.g. modification or removal of charging rule, or
- 'Fully formed' charging rule and the required action, i.e. installation of a charging rule

As an alternative to providing a single sharging rule, the CRF may provide a reference to a group of charging rules predefined at the TPF and the required action, i.e. activation or deactivation of the group.

The CRF may combine multiple of the above charging rule provisionings in a single command.

To activate a predefined charging rule at the TPF, charging rule name shall be used as a reference to the predefined charging rule. To activate a group of predefined charging rules within the TPF (e.g. gold users or gaming services) charging rule base name shall be used as a reference to the group of predefined charging rules. The same references shall be used for deactivating predefined and removing CRF-provided charging rules from a bearer ~~session~~, which for GPRS is a PDP context. See the AVP definitions in clause 5.2.

To provision or modify a CRF defined charging rule, the Charging-Rule-Definition AVP shall be used. If a charging rule with the same charging rule name already exists at the TPF, the new charging rule shall update the currently

installed charging rule. If the existing charging rule already has charging attributes also included in the new charging rule definition, the existing attributes shall be overwritten. Any charging attribute in the existing charging rule not included in the new charging rule definition shall remain valid.

Next modified Clauses

5.2.2 Charging-Rule-Install AVP

The Charging-Rule-Install AVP (AVP code 1001) is of type Grouped, and it is used for installing or modifying charging rules for a bearer ~~session~~ as instructed from the CRF to the TPF. Charging-Rule-Name AVP is a reference for activating a specific charging rule predefined at the TPF. The Charging-Rule-Base-Name AVP is a reference for activating a group of charging rules predefined at the TPF. The Charging-Rule-Definition AVP is used for installing or modifying charging rules provisioned over the Gx interface.

AVP Format:

```
Charging-Rule-Install ::= < AVP Header: 1001 >
                          *[ Charging-Rule-Definition ]
                          *[ Charging-Rule-Name ]
                          *[ Charging-Rule-Base-Name ]
                          *[ AVP ]
```

5.2.3 Charging-Rule-Remove AVP

The Charging-Rule-Remove AVP (AVP code 1002) is of type Grouped, and it is used for removing charging rules from a bearer ~~session~~. Charging-Rule-Name AVP is a reference for a specific charging rule at the TPF to be removed or for a specific charging rule predefined at the TPF to be deactivated.. The Charging-Rule-Base-Name AVP is a reference for a group of charging rules predefined at the TPF to be deactivated.

AVP Format:

```
Charging-Rule-Remove ::= < AVP Header: 1002 >
                          *[ Charging-Rule-Name ]
                          *[ Charging-Rule-Base-Name ]
                          *[ AVP ]
```

5.2.4 Charging-Rule-Definition AVP

The Charging-Rule-Definition AVP (AVP code 1003) is of type Grouped, and it defines the charging rule for a service flow sent by the CRF to the TPF. The Charging-Rule-Name AVP uniquely identifies the charging rule ~~within~~ for a ~~the~~ bearer ~~session~~ and it is used to reference to a charging rule in communication between the TPF and the CRF. The Flow-Description AVP(s) determines the traffic that belongs to the service flow.

If optional AVP(s) within a Charging-Rule-Definition AVP are omitted, but corresponding information has been provided in previous Gx messages, the previous information remains valid. If Flow-Description AVP(s) are supplied, they replace all previous Flow-Description AVP(s). If Flows AVP(s) are supplied, they replace all previous Flows AVP(s),

AVP Format:

```
Charging-Rule-Definition ::= < AVP Header: 1003 >
                             { Charging-Rule-Name }
                             [ Service-Identifier ]
                             [ Rating-Group ]
                            *[ Flow-Description ]
                             [ Reporting-Level ]
                             [ Online ]
                             [ Offline ]
                             [ Metering-Method ]
                             [ Precedence ]
                             [ AF-Charging-Identifier ]
                            *[ Flows ]
                            *[ AVP ]
```

Next modified Clause

5.2.6 Charging-Rule-Name AVP

The Charging-Rule-Name AVP (AVP code 1005) is of type OctetString, and it uniquely identifies a charging rule ~~within~~ for a~~the~~ bearer ~~session~~.

Next modified Clause

6.1.1 CC-Request (CCR) Command

The CCR command, indicated by the Command-Code field set to xxx (IETF suggested value 272) and the 'R' bit set in the Command Flags field, is sent by the TPF to the CRF in order to request charging rules for a bearer. The CCR command is also sent by the TPF to the CRF in order to indicate the termination of the bearer ~~session~~.

Message Format:

```
<CC-Request> ::= < Diameter Header: xxx (272), REQ, PXY >
                 < Session-Id >
                 { Auth-Application-Id }
                 { Origin-Host }
                 { Origin-Realm }
                 { Destination-Realm }
                 { CC-Request-Type }
                 { CC-Request-Number }
                 [ Destination-Host ]
                 [ CC-Sub-Session-Id ]
                 [ Origin-State-Id ]
                *[ Subscription-Id ]
                 [ Framed-IP-Address ]
                 [ Framed-IPv6-Prefix ]
                 [ RAT-Type ]
                 [ Termination-Cause ]
                 [ User-Equipment-Info ]
                 [ 3GPP-GPRS-Negotiated-QoS-Profile ]
                 [ 3GPP-SGSN-MCC-MNC ]
                 [ 3GPP-SGSN-Address ]
                 [ 3GPP-SGSN-IPv6-Address ]
                 [ Called-Station-ID ]
                 [ Bearer-Usage ]
                *[ TFT-Packet-Filter-Information ]
                *[ Proxy-Info ]
                *[ Route-Record ]
                *[ AVP ]
```

3GPP TSG-CN WG3 Meeting #35 ***Tdoc ⌘N3-050226***

Sydney, Australia. 14th - 18th February 2005.

CR-Form-v7.1

CHANGE REQUEST

⌘ **29.210** **CR** **6** ⌘ **rev** **3** ⌘ Current version: **6.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	TFT filter usage
Source:	⌘	Siemens
Work item code:	⌘	CH-FBC
Date:	⌘	18/02/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

Ph2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*
Rel-7	*(Release 7)*

Reason for change:	⌘	Unclear if all TFT filters need to be provided in each CCR, or previous information remains valid. A TFT Packet filter may not contain a source IP address, source or destination port, but this information is not mandated at the Gx interface. Usage of invert modifier "!" and has no usefull meaning at Gx, but needs to be supported by the CRF because it is not excluded. Direction parameter used in wrong manner: it would describe uplink IP flows that are not targeted by TFT filters.
Summary of change:	⌘	All TFT filters need to be provided in each CCR. Source IP address, source or destination port shall be wildcarded if not available. Some additional restrictions added for usage of TFT filters. Mapping of TFT filter Parameters to IPfilterType parameters detailed
Consequences if not approved:	⌘	Unclear semantics of TFT packet filter related AVPs in Gx protocol. Requirement that is impossible to fulfill in certain scenarios is put on GGSN. CRF implementors may be misguided to rely upon always receiving source IP address, and source or destination port.

Clauses affected:	⌘	5.2.18, 5.2.19
Other specs affected:	⌘	☐ ☐ ☐ ☒ ☐ ☒ Test specifications ☐ ☒ O&M Specifications

Other comments: ⌘	

5.2.18 TFT-Filter AVP

The TFT-Filter AVP (AVP code 1017) is of type IPFilterRule, and it contains the flow filter for one TFT packet filter. The TFT-Filter AVP is derived from the Traffic Flow Template (TFT) defined in 3GPP TS 24.008 [14]. The following information shall be sent:

- Action shall be set to "permit".
- Direction shall be set to "out".
- ~~-~~ Protocol shall be set to the value provided within the TFT packet filter parameter "Protocol Identifier/Next Header Type". If the TFT packet filter parameter "Protocol Identifier/Next Header Type" is not provided within the TFT packet filter~~,~~ Protocol shall be set to "IP".
- Source IP address (possibly masked). The source IP address shall be derived from TFT packet filter parameters "Source address" and "Subnet Mask". The source IP address shall be set to "any", if no such information is provided in the TFT packet filter.
- Source and destination port (single value, list or ranges). The information shall be derived from the corresponding TFT packet filter parameters. Source and/or destination port(s) shall be omitted if such information is not provided in the TFT packet filter.
- The Destination IP address shall be set to "assigned".

~~- Source and destination port (list or ranges)~~

The IPFilterRule type shall be used with the following restrictions:

~~- Action shall be to "permit"~~

~~- Direction shall be set to "in"~~

~~-~~ No options shall be used.

~~-~~ Destination IP address shall be wildcarded.

- The invert modifier "!" for addresses shall not be used.

The direction "~~in~~out" refers to ~~uplink~~ downlink direction ~~in order to define the source and destination addresses and ports unambiguously~~.

5.2.19 TFT-Packet-Filter-Information AVP

The TFT-Packet-Filter-Information AVP (AVP code 1018) is of type Grouped, and it contains the information from a single TFT packet filter including the evaluation precedence, the filter and the Type-of-Service/Traffic Class sent from the TPF to the CRF. The TPF shall include one TFT-Packet-Filter-Information AVP for each ~~all the~~ TFT packet filter~~s~~ applicable at a PDP context in separate TFT-Packet-Filter-Information AVPs ~~to~~ within ~~the~~ each charging rule request corresponding to that PDP context. TFT-Packet-Filter-Information AVPs are derived from the Traffic Flow Template (TFT) defined in 3GPP TS 24.008 [14]. When SBLP is used the packet filters shall be omitted.

AVP Format:

```
TFT-Packet-Filter-Information ::= < AVP Header: 1018 >
                                  [ Precedence ]
                                  [ TFT-Filter ]
                                  [ ToS-Traffic-Class ]
```