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Standards that Drive the Business of Communications

TMOC-2006-048
May 4, 2006

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RE: Draft Proposed ITU-T Recommendation on NGN Accounting Management based on TMOC/3GPP Harmonization Results

Dear Dave and Alain:

As a follow up to the TMOC/3GPP harmonization results regarding NGN Accounting Management and per discussions at the recent ITU-T NGNM Focus Group conference call (on April 27, 2006), attached is an updated draft of a proposed ITU-T Recommendation on NGN Accounting Management – for informational and ITU-T SG4 project initiation discussions. This draft TMOC proposal is based on the TMOC/3GPP harmonization results (S5-064229/TMOC-2006-022, 3GPP clarification [S5-060130/TMOC-2006-046] and TMOC response [TMOC-2006-047]) and supersedes the initial draft (TMOC-2006-034).

Please use this enclosed draft (and the other TMOC/3GPP harmonization related liaisons) for informational and project initiation discussions during the upcoming SG4 meeting, as appropriate. Please keep me informed of any developments related to this matter, and proposed next steps out of the SG4 meeting. Virtual meetings and/or conference calls would be preferred for follow up discussions.

Best regards,

/s/ ***Mike Fargano***
TMOC Chairman

Att.
TMOC-AIP-2006-016R4 -- *Draft of a Proposed ITU-T Recommendation on NGN Accounting Management based on TMOC/3GPP Harmonization Results*

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TMOC-AIP-2006-016R4

Question(s):		**Meeting, date:**	
Study Group:	SG4 **Working Party**:	**Intended type of document** (**R-C-D-TD**):	
Source:			
Title:	ITU-T Harmonization of Accounting Management Mechanisms for NGN		

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<Recommendation No.>

NGN Accounting Management

Summary

This document describes the protocols that could be used for NGN Accounting Management. These protocols have been developed by ATIS TMOC and by the 3GPP SA5. The information and guidance on the harmonization of these protocols is provided in this document. The ATIS TMOC and the 3GPP SA5 protocols themselves are described by references to their original specification documents.

Keywords

<Optional>

Introduction

The ITU-T SG-13 Y.ngn-account specification [1] provides high level requirements and framework for Accounting, Charging and Billing Capabilities in NGN.

The 3GPP (offline and online) charging specifications are organized as follows:

- TS 32.240 [5] describes the commonly applicable charging architecture and principles
- “middle tier” specifications 32.250 to 32.273 [6] specify the mapping of the architecture and principles onto the specific bearer, service or subsystem
- the 32.29x [7] specifications describe commonly applicable protocol applications.

The middle tier specifications, of which IMS charging (TS 32.260) is considered most applicable to the subject matter of this document, are technology specific whereas all remaining specifications can be considered technology independent in terms of no existing linkage to particular systems or services.

Section 11 of the ITU-T SG-13 Y.ngn-account specification [1] provides a high-level description of Charging Data Transmission Protocols.
Section 6.2.5.1 of the FGNGN FRA version 5 document [4] describes the CTF, "a necessary component in all network elements that provide offline-charging functionality." Following this specification a CTF generates charging events (based on the observation of network resource usage) and sends them towards the CCF. Section 6.2.5.2 of the same document [4], describes how the CCF

uses the information contained in the charging events it receives from the CTF to construct CDRs that are later transferred to the billing domain.

CCF can be further defined as CDF and CGF. The Interface between CDF and CGF is for CDRs sent from CDF to CGF, and for acknowledging the CDRs returned from CGF to CDF.

According to the ATIS TMOC-AIP RDC&P Reference Model described in [2] (see the charging architecture and information flows described in [5] and the below figures):

- the (Rf) interface between the CTF and the CCF is termed: "Interface A".
- the (Ga) interface between the CDF and the CGF is termed: "Interface B".
- the (Bx) interface between the CCF and the billing domain is termed: "Interface D".

The TMOC-AIP Protocol Specification document [3] suggests utilizing a specific streaming protocol and an information model based on XML (that is mapped to XDR for transport efficiency) for both the A interface, the D interface and optionally the B interface.

1 Scope

While part of the 3GPP charging specifications has an overlap with the ATIS/TMOC accounting management specifications, these two sets of specifications also cover different aspects of NGN accounting management:

- The ITU-T SG13 Y.ngn-account specification [1] requires that the mechanisms allowing accounting, charging, and billing capabilities “should be able to handle various NGN services” (see S-R-001 in [1] section 6). The 3GPP SA5 SWG-B charging management specifications had a significant legacy infrastructure to consider and are primarily focused on 3G wireless whereas focus of the ATIS/TMOC specifications is on a more generalized flexibility of service approach.
- The ITU-T SG13 Y.ngn-account specification [1] requires that both on-line and off-line charging should be supported in NGN (see F-C-R-001 of sub-section 7.3 - charging functional requirements). Online charging is not in scope from TMOC perspective. Therefore, there is no conflict related to this area of the charging standards.

2 References

The following references contain provisions, which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[1] ITU-T SG-13 Revised version of draft Y.ngn-account (Requirements and Framework Allowing Accounting, Charging and Billing Capabilities in NGN) as agreed output of April 25- May 6 2005 Q.2/13 meeting in Geneva, Switzerland.

[2] Usage Data Management for Packet-Based Services - Service-Neutral Architecture and Protocol Requirements TMOC-AIP-2005-024R10 (ATIS-0300075)

[3] Usage Data Management for Packet-Based Services - Service-Neutral Protocol Specification for Billing Applications, American National Standard (ANS)[1], ATIS-0300075.1-2005.

[4] FGNGN FRA version 5, FGNGN-OD-00146

[5] 3GPP SA5 TS 32.240 V6.0.0 (2004-09)

[6] 3GPP “middle tier” specifications 32.250 to 32.273

[7] 3GPP commonly applicable protocol applications 32.29x

3 Definitions

3GPP - A collaboration agreement that was established in December 1998. It's a co-operation between ETSI (Europe), ARIB/TTC (Japan), CCSA (China), ATIS (North America) and TTA (South Korea). The scope of 3GPP was to make a globally applicable third generation (3G) mobile phone system specification within the scope of the ITU's IMT-2000 project. 3GPP specifications are based on evolved GSM specifications, now generally known as the UMTS system.

3GPP2 - Specifies standards for 3G technology based on IS-95 (CDMA), commonly known as CDMA2000.

Accounting Management - A set of functions which enable the use of network services to be measured and the costs for such use to be determined and rendered (Ref. ITU-T Recommendation M.60 (93), 2000).

BD – a 3GPP term that stands for part of the operator network, which is outside the telecommunication network, that receives and processes charging information from the core network charging functions. It includes functions that can provide billing mediation and billing or other (e.g. statistical) end applications. It is only applicable to offline charging.

Bx - 3GPP’s Reference point for CDR file transfer between any (generic) 3G domain, subsystem or service CGF and the BD.

CCF – a 3GPP term that stands for an entity that receives charging events from the CTF via the Rf reference point. It then uses the information contained in the charging events to construct CDRs. It uses the Bx reference point for the transfer of CDR files to the BD.

CDF – a 3GPP term that stands for an entity that receives charging events from the CTF via the Rf reference point. It then uses the information contained in the charging events to construct CDRs.

CGF – a 3GPP term that stands for an entity that acts as a gateway between the 3GPP network and the Billing Domain. It uses the Bx reference point for the transfer of CDR files to the BD. The entity relationship between the CDF and the CGF is m:1, i.e. one or more CDFs may feed CDRs into a single CGF.

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[1] This ANS is currently in the process of moving from a Trial Use status to a full ANS

CTF – a 3GPP term that stands for an entity that generates charging events based on the observation of network resource usage. It is a focal point for collecting the information pertaining to chargeable events within the network element, assembling this information into matching charging events, and sending these charging events towards the CDF.

Charging:

- The set of functions needed to determine the price assigned to the service utilization (Ref. ITU-T Recommendation Q.825 (98), 3.1.8).
- A function whereby information related to a chargeable event is formatted and transferred in order to make it possible to determine usage for which the charged party may be billed (Ref. ITU-T Recommendations: Q.1741.1 (02), 3.7; Q.1741.2 (02), 3.15; Q.1741.3 (03), 3.18)

Ga - 3GPP's Reference point for CDR transfer between a CDF and the CGF

NGN-CDF – A CDF that is able to accept as input the TMOC accounting protocol (IPDR/SP) in addition to its ability to accept the Rf.

NGN-CGF – A CGF that is able to:

1. Accept as input the TMOC accounting protocol (IPDR/SP) in addition to its ability to accept the Ga (in case it is separate from the NGN-CDF).
2. Export the TMOC accounting protocol (either IPDR/SP or IPDR/F) in addition to its ability to export the Bx.

NGN-CTF – A CTF that may have additional features as will be defined by the ITU-T in the future.

Offline charging - Charging mechanism where charging information does not affect, in real-time, the service rendered

Online charging - Charging mechanism where charging information can affect, in real-time, the service rendered and therefore a direct interaction of the charging mechanism with session/service control is required.

Rf - Offline Charging Reference Point between the CTF within a 3G network entity and the CDF

4 Abbreviations

The following are abbreviations used in this Recommendation

3GPP - 3rd Generation Partnership Project.

ATIS - Alliance for Telecommunications Industry Solutions

BD - Billing Domain

CCF – Charging Collection Function

CDF - Charging Data Function

CDR - Charging Data Record

CGF - Charging Gateway Function

CTF - Charging Trigger Function

IMS - IP Multimedia System

IPDR - Internet Protocol Detailed Record

IPDR/F - IPDR File

IPDR/SP - IPDR Streaming Protocol

ITU-T - International Telecommunication Union - Telecommunication

NGN – Next Generation Networks

TMOC - Telecom Management and Operations Committee

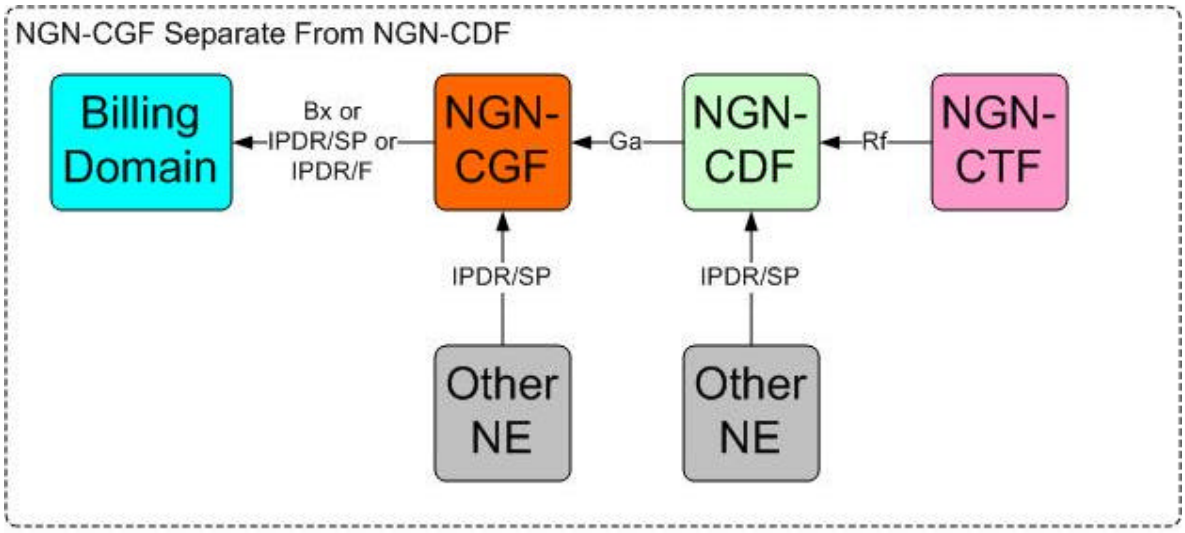
5 Merging of the ATIS/TMOC and 3GPP SA5 Approaches

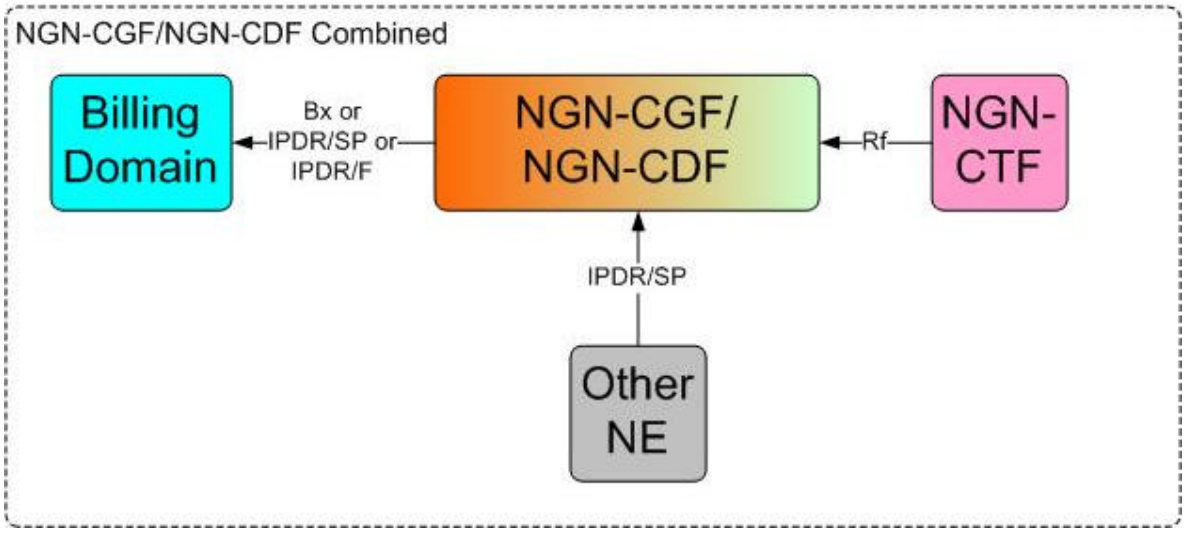
The ITU-T SG13 Y.ngn-account specification [1] requires the availability of an open architecture for accounting, charging and billing, that is able to handle various NGN services (see S-R-001 in section 6 - service requirements for mechanisms allowing accounting, charging, and billing capabilities within NGN Release 1 [1]).

Such an open architecture is described both in the ATIS/TMOC ATIS-0300075 specification and in the 3GPP TS 32.240 specification [5].

The ATIS/TMOC approach for NGN Accounting/Charging Management standards [3] is hereby combined with the 3GPP SA5 SWG-B approach for NGN Accounting/Charging Management standards as follows (see the below diagram):

1. NGN-CGF should be able to export either Bx or TMOC protocol (either IPDR/SP or IPDR/F).
2. NGN-CGF should be able to accept as input either Ga (in case it is separate from the NGN-CDF) or TMOC protocol (IPDR/SP).
3. NGN-CDF should be able to accept as input either Rf or TMOC protocol (IPDR/SP).
4. Billing domain should be able to accept as input either Bx or TMOC protocol (either IPDR/SP or IPDR/F).
5. No other changes are required in IMS accounting architecture or elements not aforementioned.


NGN-CGF Separate From NGN-CDF
Billing Domain
Bx or IPDR/SP or IPDR/F
NGN-CGF
Ga
NGN-CDF
Rf
NGN-CTF
IPDR/SP
IPDR/SP
Other NE
Other NE


NGN-CGF/NGN-CDF Combined
Billing Domain
Bx or IPDR/SP or IPDR/F
NGN-CGF/ NGN-CDF
Rf
NGN-CTF
IPDR/SP
Other NE