Charging Data

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Open Mobile Alliance

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1. Scope

This Data Definition Specification serves as the centralised catalogue of all OMA Charging Data Elements defined for the OMA Offline Charging Interface (CH-1) and the OMA Online Charging Interface (CH-2). It also specifies the mapping of OMA Charging Data Elements to protocol fields used in the OMA-specified protocol bindings for the CH-1 and CH-2 interfaces.

2. References

2.1 Normative References

[CHRG_OFFLINE] "OMA Offline Charging Interface", Open Mobile Alliance™. OMA-TS-Charging_Offline-V1_1, URL: http://www.openmobilealliance.org/

[CHRG_ONLINE] "OMA Online Charging Interface", Open Mobile Alliance™. OMA-TS-Charging_Online-V1_1, URL: http://www.openmobilealliance.org/

[RFC2119] "Key words for use in RFCs to Indicate Requirement Levels", S. Bradner, March 1997, URL:http://www.ietf.org/rfc/rfc2119.txt

[RFC3588] "Diameter Base Protocol", P. Calhoun, J. Loughney, E. Guttman, G. Zorn, J. Arkko. September 2003, URL: http://www.ietf.org/rfc/rfc3588.txt

[RFC4006] "Diameter Credit-Control Application", H. Hakala, L. Mattila, J-P. Koskinen, M. Stura, J. Loughney. August 2005, URL: http://www.ietf.org/rfc/rfc4006.txt

[TS29.140] "Multimedia Messaging Service (MMS); MM10 Interface based on Diameter Protocol", 3GPP TS29.140, URL: http://www.3gpp.org

[TS29.214] "Policy and Charging Control over Rx Reference Point", 3GPP TS29.214, URL: http://www.3gpp.org

[TS32.299] "Telecommunication management; Charging management; Diameter Charging Applications", 3GPP TS32.299 , URL: http://www.3gpp.org

2.2 Informative References

[OMADICT] "Dictionary for OMA Specifications", Open Mobile Alliance™, OMA-ORG-Dictionary, URL:http://www.openmobilealliance.org/

3. Terminology and Conventions

3.1 Conventions

The key words “MUST”, “MUST NOT”, “REQUIRED”, “SHALL”, “SHALL NOT”, “SHOULD”, “SHOULD NOT”, “RECOMMENDED”, “MAY”, and “OPTIONAL” in this document are to be interpreted as described in [RFC2119].

All sections and appendixes, except “Scope” and “Introduction”, are normative, unless they are explicitly indicated to be informative.

3.2 Definitions

CH-1	Offline Charging Interface
CH-2	Online Charging Interface

3.3 Abbreviations

3GPP	3rd Generation Partnership Project
ACA	ACcounting Answer
ACR	ACcounting Request
AVP	Attribute Value Pair
CCA	Credit Control Answer
CCR	Credit Control Request
DDS	Data Definition Specification
IM	Instant Messaging
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
IOI	Inter Operator Identification
MAC	Media Access Control
MIME	Multipurpose Internet Mail Extensions
MSCC	Multiple Service Credit Control
MSISDN	Mobile Subscriber ISDN
OMA	Open Mobile Alliance
RFC	Request for Comments
SIP	Session Initiation Protocol
URI	Universal Resource Identification

4. Introduction

This specification includes both normative and informative sections. OMA Charging Data Elements and protocol bindings that relate to the basic functionality of the Charging Enabler framework and the interfaces themselves are normatively defined in the interface specifications of the OMA Charging Enabler, and listed here only for completeness. Charging Data Elements and bindings that have been defined to carry charging information related to OMA Service Enablers or other Charging Enabler Users are normatively defined in this specification. Whereas the present document is not OMA Service Enabler specific, it generally supports data definitions pertaining to each charging enabler user.

Other OMA specifications (such as enabler-specific charging specifications) may contain references to OMA Charging Data Elements defined in this data specification, and these other specifications may specify how the Data Elements are used and applied within the service/application context of these specifications, but the normative control over the naming, numbering, hierarchy position, and generic descriptions of the Data Elements remains in this specification.

5. Justification

The OMA Charging Enabler specifies an extensible framework for OMA Charging Interfaces and the associated charging behaviour. Charging information exchanged over these interfaces consists of Charging Data Elements that contain information related to Charging Events.

Already from the beginning of the specification work for the OMA Charging Enabler, it has been foreseen that different applications and services have varying needs regarding charging information that describes the charging events that they generate, and therefore extensions to charging information structures will be needed over time as new OMA enablers, applications and services emerge.

As these extensions do not change the basic functionality and behaviour of the Charging Enabler framework itself, it is not necessary to release a new version of the OMA Charging Enabler each time new Charging Data Elements and/or protocols bindings are specified.

In order to maintain consistency of the charging interfaces and to encourage re-use and generalisation, new Charging Data Elements must be created in a coordinated way. Also from the developers' point of view, there should be one centralised catalogue where the complete functionality of the OMA Charging Enabler can be found.

6. OMA Charging Data Description

The OMA Charging Interfaces support two charging models, an Event-based charging model and a Session-based charging model. The resulting charging information flows between the Charging Enabler User and the Charging Enabler are described in the Technical Specifications for Offline Charging [CHRG_OFFLINE] and respectively for Online Charging [CHRG_ONLINE]. The messages exchanged in these flows can be categorised into Charging Requests and Charging Responses, and the structure of these messages is defined in this chapter.

6.1 Message Structures

The following tables list the OMA Charging Data Elements applicable for Charging Requests and Charging Responses.

The "Category" column indicates whether the element is mandatory or optional. The "Level" column allows the reader to clearly identify the hierarchy of data elements. Let's take the example of a data element "A" (level n) followed by data elements "B" and "C" (both being on level n+1). This means that element A comprises of element B and element C.

6.1.1 Offline Charging Requests

Hierarchy Level	OMA Charging Data Element	Category	Description
1	Request Type	Mandatory	This data element indicates the type of the Charging Request message.
1	Event Timestamp	Optional	This data element records the time at which the reported event occurred.
1	Service Context Id	Mandatory	This data element contains a value to identify the service/enabler specification in the context of which the charging events must be interpreted. Data elements such as Service Identifier, Service Specific Units, contain service specific values that are defined within a particular service context identified in this data element.
Information related to OMA service usage			
1	Application Server Id	Optional	This data element can be used to identify the application server providing the service and/or generating the charging information.
1	Application Session Id	Optional	This data element can be used to identify the application-level session to which the charging information relates. Note that the Session Id data element identifies the charging session between a charging enabler user and a charging enabler.
1	Delivery Status	Optional	This data element can be used to carry information related to the success status of service delivery.
1	Subscription Id	Optional	This data element identifies the end user's subscription
2	Subscription Type	Mandatory	This data element identifies which type of identifier is carried by the subscription-Id e.g.: email, MSISDN, IMSI, SIP URI...

Hierarchy Level	OMA Charging Data Element	Category	Description
2	Subscription Data	Mandatory	This data element identifies the end user.
1	Correlation Id	Optional	This data element contains information to correlate offline charging requests generated by different service components of the application.
1	Time	Optional	This data element indicates the length of the used time in seconds.
1	Money	Optional	This data element specifies the monetary amount in the given currency. The Currency Code data element should be included when this data element is included.
2	Unit Value	Mandatory	This data element describes a value for instance a monetary value. It consists of Value Digits and Exponent.
3	Value Digits	Mandatory	This data element contains the significant digits of a Unit Value without any decimal point.
3	Exponent	Optional	This data element contains the 10-x exponent that should be applied to the Value Digits.
2	Currency Code	Optional	This data element specifies which currency is used in a monetary value described by the Money data element.
1	Input Octets	Optional	This data element contains the number of used octets that can be/have been received from the end user.
1	Output Octets	Optional	This data element contains the number of used octets that can be/have been sent to the end user.
1	Service Specific Units	Optional	This data element specifies the number of service-specific units (e.g. number of events, points) in a selected service. The service specific units always refer to the service identified in the Service Identifier data element
1	Service Identifier	Optional	This data element contains the identifier of a specific service within the given service context, e.g. operation type.
1	Service Key	Optional	This data element can be used to identify the particular service item delivered.
1	User Equipment Info	Optional	This data element indicates the identity and capability of the terminal the end-user is using.
2	User Equipment Info Type	Mandatory	User Equipment Info Type defines the type of user equipment information contained in User Equipment Info Value, e.g. IMEI or MAC.
2	User Equipment Info Value	Mandatory	This data element contains the identity of the user equipment.

Hierarchy Level	OMA Charging Data Element	Category	Description
1	Message Body	Optional	This grouped data element contains information related to content exchanged in a message.
2	Content Type	Mandatory	This data element identifies the type of content, for example using MIME types.
2	Content Length	Mandatory	This data element identifies the length of content.
1	Participant Group	Optional	This grouped data element contains information on a participant to a service-level session.
2	Called Party Address	Optional	This data element identifies an individual participant to a service-level session.
1	Role of Node	Optional	This data element can be used to identify the role of the node generating the charging event in the service event, e.g. sending, receiving, controlling and participating.
1	Role of User	Optional	This data element can be used to identify the role of the user which the charging event relates to in the service event, e.g. session owner or participant.
1	Application Service Type	Optional	This data element can be used to differentiate between the different roles of a node within service events, e.g. the sending and receiving roles of participating and controlling functions.
1	Number Of Participants	Optional	This data element can be used to indicate the number of parties involved in the service event, e.g. participating a session.
1	Calling Party Address	Optional	This data element can be used to identify the party initiating the service event, e.g. the sender of a message. The initiating party is usually indicated in the Subscription Id data element in its role as the charged party. However, the charged party may also be some other party while the actual initiating party still needs to be identified.
1	Called Party Address	Optional	This data element can be used to identify the receiving party of a communication or the party that is the target of an operation (other than the initiator).
1	Group Name	Optional	This data element can be used to indicate the identifier of a group related to the event, e.g. a pre-defined distribution group in a messaging service.
1	Application Charging Identifier	Optional	This data element holds an identifier that enables the correlation of various records pertaining to the same session.
1	Inter-Operator Id	Optional	The IOI identifies both originating and terminating networks involved in a session/transaction.
2	Originating IOI	Mandatory	Identifies the originating network.

Hierarchy Level	OMA Charging Data Element	Category	Description
2	Terminating IOI	Mandatory	Identifies the terminating network.
1	Access Network Information	Optional	This data element can be used to carry information related to the access network used if available.
1	Total Number of Messages Sent	Optional	This data element can be used to indicate the number of individual messages sent by the user. However, the number does not necessarily correspond to the number of message actually delivered.
1	Total Number of Messages Exploded	Optional	This data element can be used to indicate the total number of messages exploded by the IM server.
1	Number of Messages Successfully Sent	Optional	This data element indicates the number of individual messages sent by the user that were successfully delivered to at least one recipient.
1	Number of Messages Successfully Exploded	Optional	This data element can be used to indicate the total number of messages exploded by the IM server that were successfully delivered.
1	SIP Method	Optional	This data element can be used to identify the SIP Method triggering the charging event.
1	Expires	Optional	The Expires data element indicates the relative time after which the SIP message expires.
1	Cause Code	Optional	This data element can be used to indicate the returned SIP status code for the service request.
1	SIP Request Timestamp	Optional	This data element can be used to carry a timestamp related to the start of a service delivery operation.
1	SIP Response Timestamp	Optional	This data element can be used to carry a timestamp related to the end of a service delivery operation.

Table 1: OMA Charging Data Elements in Offline Charging Requests

6.1.2 Offline Charging Responses

Hierarchy Level	OMA Charging Data Element	Category	Description
1	Result Code	Mandatory	This data element indicates the result of a particular request.
1	Request Type	Mandatory	This data element indicates the type of the corresponding Charging request message.
1	Event Timestamp	Optional	This data element records the time at which the reported event occurred.

Table 2: OMA Charging Data Elements in Offline Charging Responses

6.1.3 Online Charging Requests

Hierarchy Level	OMA Charging Data Element	Category	Description
1	Session Id	Mandatory	This data element is used to identify a specific session. All messages pertaining to a specific session must use the same value.
1	Service Context Id	Mandatory	This data element contains a value to identify the service/enabler specification in the context of which the Charging Events must be interpreted. Data elements such as Service Identifier, Service Specific Units, contain service specific values that are defined within a particular service context identified in this data element.
1	Request Type	Mandatory	This data element contains the reason for sending the online charging request message
1	Event Timestamp	Optional	This data element records the time at which the reported event occurred.
1	Subscription Id	Optional	This data element identifies the end user's subscription
2	Subscription Type	Mandatory	This data element identifies which type of identifier is carried by the subscription-Id e.g.: email, MSISDN, IMSI, SIP URI...
2	Subscription Data	Mandatory	This data element identifies the end user.
1	Termination Cause	Optional	This data element indicates the reason why a session was terminated on the access device.
1	Requested Action	Optional	This data element contains the requested action being sent by Charging Enabler User when Request Type is set to EVENT_REQUEST.
1	Multiple Service Indicator	Optional	This data element indicates the use of Multiple Services Credit Control data element.

Hierarchy Level	OMA Charging Data Element	Category	Description
1	Multiple Services Credit Control	Optional	This data element contains a *list* of data elements from a single Charging Enabler User that is providing multiple services.
2	Requested Service Unit	Optional	This data element contains the amount of requested units from the point before the service became active or, if interim interrogations are used during the session, from the point when the previous measurement ended.
3	Time	Optional	This data element indicates the length of the requestedtime in seconds.
3	Money	Optional	This data element specifies the monetary amount in the given currency. The Currency Code field should be included when This data element is included.
4	Unit Value	Mandatory	This data element describes a value for instance a monetary value. It consists of Value Digits and Exponent.
5	Value Digits	Mandatory	This data element contains the significant digits of a Unit Value without any decimal point.
5	Exponent	Optional	This data element contains the 10^{-x} exponent that should be applied to the Value Digits.
4	Currency Code	Optional	This data element specifies which currency is used in a monetary value described by the Money field.
3	Total Octets	Optional	This data element contains the total number of requested octets, regardless of the direction (sent or received).
3	Input Octets	Optional	This data element contains the number of requested octets that can be/have been received from the end user.
3	Output Octets	Optional	This data element contains the number of requested octets that can be/have been sent to the end user.
3	Service Specific Units	Optional	This data element specifies the number of service-specific units (e.g. number of events, points) given in a selected service. The service specific units always refer to the service identified in the Service Identifier field
2	Used Service Unit	Optional	This data element contains the amount of used units measured from the point when the service became active or, if interim interrogations are used during the session, from the point when the previous measurement ended.
3	Reporting Reason	Optional	This data element specifies the reason for usage reporting for one or more types of quota for a particular category.

Hierarchy Level	OMA Charging Data Element	Category	Description
3	Tariff Change Usage	Optional	This data element identifies the reporting period for the used service unit, i.e. before, after or during tariff change.
3	Time	Optional	This data element indicates the length of the used time in seconds.
3	Money	Optional	This data element specifies the monetary amount in the given currency. The Currency Code field should be included when This data element is included.
4	Unit Value	Mandatory	This data element describes a value for instance a monetary value. It consists of Value Digits and Exponent.
5	Value Digits	Mandatory	This data element contains the significant digits of a Unit Value without any decimal point.
5	Exponent	Optional	This data element contains the 10^{-x} exponent that should be applied to the Value Digits.
4	Currency Code	Optional	This data element specifies which currency is used in a monetary value described by the Money field.
3	Total Octets	Optional	This data element contains the total number of used octets regardless of the direction (sent or received).
3	Input Octets	Optional	This data element contains the number of used octets that can be/have been received from the end user.
3	Output Octets	Optional	This data element contains the number of used octets that can be/have been sent to the end user.
3	Service Specific Units	Optional	This data element specifies the number of service-specific units (e.g., number of events, points) given in a selected service. The service specific units always refer to the service identified in the Service Identifier field
2	Service Identifier	Optional	This data element contains the identifier of a specific service within the given service context, e.g. operation type.
2	Rating Group	Optional	This data element contains the identifier of a rating group.
2	Reporting Reason	Optional	This data element specifies the reason for usage reporting for one or more types of quota for a particular category.
2	Trigger	Optional	This data element contains the trigger types.
3	Trigger Type	Optional	This data element indicates a single re-authorisation event type.
1	User Equipment Info	Optional	This is a grouped data element that can be used to indicate the identity and capability of the terminal the

Hierarchy Level	OMA Charging Data Element	Category	Description
			end-user is using.
2	User Equipment Info Type	Mandatory	User Equipment Info Type defines the type of user equipment information contained in User Equipment Info Value, e.g. IMEI or MAC.
2	User Equipment Info Value	Mandatory	Contains the identity of the user equipment.
Information related to OMA service usage			
1	Application Server Id	Optional	This data element can be used to identify the application server providing the service and/or generating the charging information.
1	Application Session Id	Optional	This data element can be used to identify the application-level session to which the charging information relates. Note that the Session Id data element identifies the charging session between a charging enabler user and a charging enabler.
1	Delivery Status	Optional	This data element can be used to carry information related to the success status of service delivery.
1	Service Key	Optional	This data element can be used to identify the particular service item delivered.
1	Correlation Id	Optional	This data element contains information to correlate charging requests generated for different service components of the application.
1	Message Body	Optional	This grouped data element contains information related to content exchanged in a message.
2	Content Type	Mandatory	This data element identifies the type of content, for example using MIME types.
2	Content Length	Mandatory	This data element identifies the length of content.
1	Participant Group	Optional	This grouped data element contains information on a participant to a service-level session.
2	Called Party Address	Optional	This data element identifies an individual participant to a service-level session.
1	Role of Node	Optional	This data element can be used to identify the role of the node generating the charging event in the service event, e.g. sending, receiving, controlling and participating.
1	Role of User	Optional	This data element can be used to identify the role of the user which the charging event relates to in the service event, e.g. session owner or participant.
1	Application Service Type	Optional	This data element can be used to differentiate between the different roles of a node within service events, e.g. the sending and receiving roles of participating and controlling functions.

Hierarchy Level	OMA Charging Data Element	Category	Description
1	Number of participants	Optional	This data element can be used to indicate the number of parties involved in the service event, e.g. participating a session.
1	Calling Party Address	Optional	This data element can be used to identify the party initiating the service event, e.g. the sender of a message. The initiating party is usually indicated in the Subscription Id data element in its role as the charged party. However, the charged party may also be some other party while the actual initiating party still needs to be identified.
1	Called Party Address	Optional	This data element can be used to identify the receiving party of a communication or the party that is the target of an operation (other than the initiator).
1	Group Name	Optional	This data element can be used to indicate the identifier of a group related to the event, e.g. a pre-defined distribution group in a messaging service.
1	Application Charging Identifier	Optional	This data element holds an identifier that enables the correlation of various records pertaining to the same session.
1	Inter-Operator Id	Optional	The IOI identifies both originating and terminating networks involved in a session/transaction.
2	Originating IOI	Mandatory	Identifies the originating network.
2	Terminating IOI	Mandatory	Identifies the terminating network.
1	Access Network Information	Optional	This data element can be used to carry information related to the access network used if available.
1	Total Number of Messages Sent	Optional	This data element can be used to indicate the number of individual messages sent by the user. However, the number does not necessarily correspond to the number of message actually delivered.
1	Total Number of Messages Exploded	Optional	This data element can be used to indicate the total number of messages exploded by the IM server.
1	Number of Messages Successfully Sent	Optional	This data element indicates the number of individual messages sent by the user that were successfully delivered to at least one recipient.
1	Number of Messages Successfully Exploded	Optional	This data element can be used to indicate the total number of messages exploded by the IM server that were successfully delivered.
1	SIP Method	Optional	This data element can be used to identify the SIP Method triggering the charging event.
1	Expires	Optional	The Expires data element indicates the relative time after which the SIP message expires.
1	Cause Code	Optional	This data element can be used to indicate the returned

Hierarchy Level	OMA Charging Data Element	Category	Description
			SIP status code for the service request.
1	SIP Request Timestamp	Optional	This data element can be used to carry a timestamp related to the start of a service delivery operation.
1	SIP Response Timestamp	Optional	This data element can be used to carry a timestamp related to the end of a service delivery operation.

Table 3: OMA Charging Data Elements in Online Charging Requests

6.1.4 Online Charging Responses

Hierarchy Level	OMA Charging Data Element	Category	Description
1	Session Id	Mandatory	This data element identifies a specific session. All messages pertaining to a specific session must use the same value.
1	Result Code	Mandatory	This data element indicates the result of a particular request.
1	Request Type	Mandatory	This data element contains the reason for sending the online charging request message.
1	Multiple Services Credit Control	Optional	This data element contains a list of data elements from a single Charging Enabler User that is providing multiple services.
2	Granted Service Unit	Optional	This data element contains the amount of units that the Diameter credit-control client can provide to the end user until the service must be released or the new Request must be sent.
3	Tariff Time Change	Optional	This data element indicates the time in seconds since January 1, 1900, 00:00 UTC until the tariff of the service will be changed.
3	Time	Optional	This data element indicates the length of the granted time in seconds.
3	Money	Optional	This data element specifies the monetary amount in the given currency. The Currency Code field should be included when This data element is included.
4	Unit Value	Mandatory	This data element describes a value for instance a monetary value. It consists of Value Digits and Exponent.
5	Value Digits	Mandatory	This data element contains the significant digits of a Unit Value without any decimal point.
5	Exponent	Optional	This data element contains the 10-x exponent that should be applied to the Value Digits.
4	Currency Code	Optional	This data element specifies which currency is used in a monetary value described by the Money field.
3	Total Octets	Optional	This data element contains the total number of granted octets regardless of the direction (sent or received).
3	Input Octets	Optional	This data element contains the number of granted octets that can be/have been received from the end user.
3	Output Octets	Optional	This data element contains the number of granted octets that can be/have been sent to the end user.

Hierarchy Level	OMA Charging Data Element	Category	Description
3	Service Specific Units	Optional	This data element specifies the number of service-specific units (e.g., number of events, points) given in a selected service. The service specific units always refer to the service identified in the Service Identifier field
2	Service Identifier	Optional	This data element contains the identifier of a service. The specific service the request relates to is uniquely identified by the combination of Service-Context-Id and Service-Identifier.
2	Rating Group	Optional	This data element contains the identifier of a rating group.
2	Validity Time	Optional	This data element contains the validity time of the granted service units. The value field of the Validity Time field is given in seconds.
1	Cost Information	Optional	This data element is used to return the cost information of a service, which the Charging Enabler User can transfer transparently to the end user.
2	Unit Value	Mandatory	The Unit Value element contains the cost estimate (always type of money) of the service, in the case of price enquiry, or the accumulated cost estimation, in the case of credit-control session.
3	Value Digits	Mandatory	This data element contains the significant digits of a Unit Value without any decimal point.
3	Exponent	Optional	This data element contains the 10-x exponent that should be applied to the Value Digits.
2	Currency Code	Mandatory	This data element specifies which currency is used in a monetary value described by the Unit Value field.
2	Cost Unit	Optional	Cost Unit specifies the applicable unit to the Cost Information element when the service cost is a cost per unit (e.g., cost of the service is $1 per minute). The Cost Unit can be minutes, hours, days, kilobytes, megabytes, etc.
1	Check Balance Result	Optional	This data element contains the result of the balance check. It is applicable only when the Requested Action element indicates BALANCE_CHECK in the corresponding request message.
1	Low Balance Indication	Optional	This data element indicates a low balance threshold with regard to the designated service usage. This indication can be used, e.g. to advise the end-user about a need to replenish the account balance.

Table 4: OMA Charging Data Elements in Online Charging Responses

6.2 OMA Charging Data Elements

This section describes the usage and values related to specific OMA Charging Data Elements in alphabetical order.

6.2.1 Access Network Information

This data element can be used to carry information related to the access network used if available.

6.2.2 Application Charging Identifier

This data element holds an identifier that enables the correlation of various records pertaining to the same session

6.2.3 Application Service Type

This data element can be used to differentiate between the different roles of a node within service events, e.g. the sending and receiving roles of participating and controlling functions.

Service Context	Name	Value	Description
SIMPLE_IM	SENDING	100	
	RECEIVING	101	
	RETRIEVAL	102	
	INVITING	103	
	LEAVING	104	
	JOINING	105	

Table 5: Application Service Type Values

6.2.4 Application Server Id

This data element can be used to identify the application server providing the service and/or generating the charging information.

6.2.5 Application Session Id

This data element can be used to identify the application-level session to which the charging information relates. Note that the Session Id data element identifies the *charging* session between a charging enabler user and a charging enabler.

6.2.6 Calling Party Address

This data element can be used to identify the party initiating the service event, e.g. the sender of a message. The initiating party is usually indicated in the Subscription Id data element in its role as the charged party. However, the charged party may also be some other party while the actual initiating party still needs to be identified.

6.2.7 Called Party Address

This data element can be used to identify the receiving party of a communication or the party that is the target of an operation (other than the initiator).

This data element identifies an individual participant to a service-level session.

6.2.8 Cause Code

This data element can be used to indicate the returned status code for the service request.

6.2.9 Check Balance Result

This data element contains the result of the balance check. It is applicable only when the Requested Action element indicates BALANCE_CHECK in the corresponding request message.

6.2.10 Content Length

This data element identifies the length of content.

6.2.11 Content Type

This data element identifies the type of content, for example using MIME types.

6.2.12 Correlation Id

This data element contains information to correlate charging requests generated by different service components of the application.

6.2.13 Cost Information

This data element is used to return the cost information of a service, which the Charging Enabler User can transfer transparently to the end user.

6.2.14 Cost Unit

This data element is used to display a human readable string to the end user.

6.2.15 Currency Code

This data element specifies which currency is used in a monetary value described by the Money data element.

6.2.16 Delivery Status

This data element can be used to carry information related to the success status of service delivery.

6.2.17 Event Timestamp

This data element records the time at which the reported event occurred.

6.2.18 Expires

The Expires data element indicates the relative time after which the message expires.

6.2.19 Exponent

This data element contains the 10^x exponent that should be applied to the Value Digits.

6.2.20 Granted Service Unit

This data element contains the amount of units that the Charging Enabler User can provide to the end user until the charging session will be released or a new Charging Request must be sent.

6.2.21 Group Name

This data element can be used to indicate the identifier of a group related to the event, e.g. a pre-defined distribution group in a messaging service.

6.2.22 Input Octets

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

6.2.23 Inter-Operator Id

The IOI identifies both originating and terminating networks involved in a session/transaction.

6.2.24 Low Balance Indication

This data element indicates a low balance threshold with regard to the designated service usage. This indication can be used, e.g. to advise the end-user about a need to replenish the account balance.

6.2.25 Message Body

This grouped data element contains information related to content exchanged for service usage.

6.2.26 Money

This data element specifies the monetary amount in the given currency. The Currency Code data element should be included when this data element is included.

6.2.27 Multiple Services Credit Control

Multiple Services Credit Control enables handling multiple services independently within a single online charging session. This data element contains a *list* of data elements from a single Charging Enabler User that is providing multiple services.

6.2.28 Number of Messages Successfully Exploded

This data element indicates the total number of messages that were successfully distributed to recipients.

6.2.29 Number of Messages Successfully Sent

This data element indicates the number of individual messages sent by the user that were successfully delivered to at least one recipient.

6.2.30 Number of Participants

This data element can be used to indicate the number of parties involved in the service event, e.g. participating a session.

6.2.31 Originating IOI

Identifies the originating network.

6.2.32 Output Octets

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

6.2.33 Participant Group

This grouped data element contains a list of participants to a service-level session.

6.2.34 Rating Group

This data element contains the identifier of a rating group.

6.2.35 Reporting Reason

This data element specifies the reason for usage reporting for one or more types of quota for a particular category.

6.2.36 Request Type

This data element indicates the type of the Charging Request message, or in a Charging Response message, the corresponding request that the response relates to.

Charging Model	Values	Description
Offline (CH-1)	EVENT_RECORD	
	START_RECORD	
	INTERIM_RECORD	
	STOP_RECORD	
Online (CH-2)	EVENT_REQUEST	
	INITIAL_REQUEST	
	UPDATE_REQUEST	
	TERMINATION_REQUEST	

6.2.37 Requested Action

This data element indicates the type of Event-based Online Charging Request being sent by Charging Enabler User when Request Type is set to EVENT_REQUEST (refer to [CHRG_ONLINE]).

Values	Description
DIRECT_DEBTING	Indicates a Debit Request
REFUND_ACCOUNT	Indicates a Refund Request
CHECK_BALANCE	Indicates a Balance Check Request
PRICE_ENQUIRY	Indicates a Price Enquiry Request

6.2.38 Requested Service Unit

This data element contains the amount of requested units from the point before the service became active or, if interim interrogations are used during the session, from the point when the previous measurement ended.

6.2.39 Result Code

This data element indicates the result of a particular request.

6.2.40 Role of Node

This data element can be used to identify the role of the node generating the charging event in the service event, e.g. sending, receiving, controlling and participating.

Service Context	Name	Value	Description
SIMPLE_IM	PARTICIPATING_FUNCTION	0	
	CONTROLING_FUNCTION	1	

Table 6: Role of Node Values

6.2.41 Role of User

This data element can be used to identify the role of the user which the charging event relates to in the service event, e.g. session owner or participant.

Service Context	Name	Value	Description
SIMPLE_IM	NORMAL_PARTICIPANT	4	
	SESSION_OWNER	3	

Table 7: Role of User Values

6.2.42 Service Context Id

This data element contains a value to identify the service/enabler specification in the context of which the charging events must be interpreted. Data elements such as Service Identifier, Service Specific Units, contain service specific values that are defined within a particular service context identified in this data element.

Value	OMA Specification	Description
BCAST@openmobilealliance.org	OMA-TS-BCAST_Services-V1_0	This value is used to identify charging activities associated with the OMA Broadcast Services enabler.
SIMPLE_IM@openmobilealliance.org	OMA-TS-SIMPLE_IM_Charging-V1_0	This value is used to identify charging activities associated with the OMA Instant Messaging using SIMPLE enabler.
DCD@openmobilealliance.org	OMA-TS-DCD_Charging-V1_0	This value is used to identify charging activities associated with the OMA Dynamic Content Delivery enabler.

Table 8: Service Context Id Values

6.2.43 Service Identifier

This data element contains the identifier of a specific service within the given service context, e.g. operation type. The specific service the request relates to is uniquely identified by the combination of Service-Context-Id and Service-Identifier.

Service Context	Name	Value	Description
BCAST	SUBSCRIBE	100	
	SUBSCRIPTION_UPDATE	101	
	UNSUBSCRIBE	102	
	TOKEN_PURCHASE	103	
	SERVICE_INTERACTION	104	
SIMPLE_IM	PAGER_MODE	200	
	LARGE_MESSAGE_MODE	201	
	SESSION_MODE	202	
	CONVERSATION_HISTORY	203	

Table 9: Service Identifier Values

6.2.44 Service Key

This data element can be used to identify the particular service item delivered.

6.2.45 Service Specific Units

This data element specifies the number of service-specific units (e.g. number of events, points) in a selected service. The service specific units always refer to the service identified in the Service Identifier data element.

6.2.46 Session Failover

This data element contains an indication to the Charging Enabler User whether or not a failover handling is to be used when necessary.

6.2.47 Session Id

This data element is used to identify a specific session. All messages pertaining to a specific session must use the same value.

6.2.48 SIP Method

This data element can be used to identify the SIP Method triggering the charging event.

6.2.49 SIP Request Timestamp

This data element can be used to carry a timestamp related to the start of a service delivery operation.

6.2.50 SIP Response Timestamp

This data element can be used to carry a timestamp related to the end of a service delivery operation.

6.2.51 Subscription Id

This data element identifies the end user's subscription

6.2.52 Subscription Data

This data element identifies the end user.

6.2.53 Subscription Type

This data element identifies which type of identifier is carried by the Subscription Id e.g.: email, MSISDN, IMSI, SIP URI...

6.2.54 Tariff Change Usage

This data element identifies the reporting period for the used service unit, i.e. before, after or during tariff change.

6.2.55 Tariff Time Change

This data element indicates the time until the tariff of the service will be changed.

6.2.56 Terminating IOI

This data element identifies the terminating network.

6.2.57 Termination Cause

This data element indicates the reason why a session was terminated on the access device.

6.2.58 Time

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

6.2.59 Total Number of Messages Exploded

This data element indicates the total number of messages distributed to recipients.

6.2.60 Total Number of Messages Sent

This data element indicates the total number of individual messages sent by the sender. However, the number does not necessarily correspond to the number of message actually delivered to recipients.

6.2.61 Total Octets

This data element contains the total number of requested, granted, or used octets, regardless of the direction (sent or received).

6.2.62 Trigger

This data element contains the trigger types.

6.2.63 Trigger Type

This data element indicates a single re-authorisation event type.

6.2.64 Unit Value

This data element describes a value, for example a monetary value. It consists of Value Digits and Exponent.

6.2.65 Used Service Unit

This data element contains the amount of used units measured from the point when the service became active or, if interim interrogations are used during the session, from the point when the previous measurement ended.

6.2.66 User Equipment Info

This data element indicates the identity of the equipment the end-user is using.

6.2.67 User Equipment Info Type

User Equipment Info Type defines the type of user equipment information contained in User Equipment Info Value, e.g. IMEI or MAC.

6.2.68 User Equipment Info Value

This data element contains the identity of the user equipment.

6.2.69 Validity Time

This data element contains the validity time of the granted service units.

6.2.70 Value Digits

This data element contains the significant digits of the number.

7. Operational Considerations

This Data Definition Specification serves as the single source of all information related to OMA Charging Data Elements and their protocol bindings, and it is centrally managed by the Mobile Commerce and Charging (MCC) Working Group. This DDS is published under an independent OMA Reference Release in order to de-couple its release cycles from the OMA Charging Enabler and the individual OMA Service Enablers. This enables OMA to publish new Charging Data Elements with short lead times as different OMA Work Items require them, and avoids publishing unnecessary minor/technical releases of the Charging Enabler.

8. Binding to Diameter

8.1 Diameter Commands on CH-1

8.1.1 Accounting Request Command

The ACR command is sent from the Charging Enabler User to the Charging Enabler in order to send charging information for the requested resource usage. This command is used for both Event Based and Session Based requests. The distinction is made accordingly to the value carried in the Accounting-Record-Type AVP (see Section 8.5.2).

```
<ACR> ::= < Diameter Header: 271, REQ, PXY >

            < Session-Id >
            { Origin-Host }
            { Origin-Realm }
            { Destination-Realm }
            { Accounting-Record-Type }
            { Accounting-Record-Number }
            [ Acct-Application-Id ]
            [ Vendor-Specific-Application-Id ]
            [ User-Name ]
            [ Accounting-Sub-Session-Id ]
            [ Acct-Session-Id ]
            [ Acct-Multi-Session-Id ]
            [ Acct-Interim-Interval ]
            [ Accounting-Realtime-Required ]
            [ Origin-State-Id ]
            [ Event-Timestamp ]
          * [ Proxy-Info ]
          * [ Route-Record ]
            [ Service-Context-Id ]
            [ Service-Information ]
          • [ AVP ]
```

8.1.2 Accounting Answer Command

The ACA command is sent from the Charging Enabler to the Charging Enabler User in response to an ACR command and is used in order to acknowledge the reception of the charging data. This command is used for both Event Based and Session Based responses. The distinction is made accordingly to the value carried in the Accounting-Record-Type AVP (see Section 8.5.2). The value of this AVP will be the same one contained in the same AVP of the corresponding request.

```
<ACA> ::= < Diameter Header: 271, PXY >

            < Session-Id >
            { Result-Code }
            { Origin-Host }
            { Origin-Realm }
            { Accounting-Record-Type }
            { Accounting-Record-Number }
            [ Acct-Application-Id ]
            [ Vendor-Specific-Application-Id ]
            [ User-Name ]
            [ Accounting-Sub-Session-Id ]
            [ Acct-Session-Id ]
            [ Acct-Multi-Session-Id ]
            [ Error-Reporting-Host ]
            [ Acct-Interim-Interval ]
            [ Accounting-Realtime-Required ]
            [ Origin-State-Id ]
            [ Event-Timestamp ]
          * [ Proxy-Info ]
          * [ AVP ]
```

8.2 Diameter Commands on CH-2

8.2.1 Credit-Control Request Command

The CCR command is sent from the Charging Enabler User to the Charging Enabler in order to request credit authorization for resource usage. This command is used for both Event Based and Session Based requests. The distinction is made accordingly to the value carried in the CC-Request-Type AVP (see Section 8.5.4).

```
<Credit-Control-Request> ::= < Diameter Header: 272, REQ, PXY >

            < Session-Id >
            { Origin-Host }
            { Origin-Realm }
            { Destination-Realm }
            { Auth-Application-Id }
            { Service-Context-Id }
            { CC-Request-Type }
            { CC-Request-Number }
            [ Destination-Host ]
            [ User-Name ]
            ~~[ CC-Sub-Session-Id ]~~
            ~~[ Acct-Multi-Session-Id ]~~
            [ Origin-State-Id ]
            [ Event-Timestamp ]
          • [ Subscription-Id ]
            ~~[ Service-Identifier ]~~
            [ Termination-Cause ]
            ~~[ Requested-Service-Unit ]~~
            [ Requested-Action ]
        ~~* [ Used-Service-Unit ]~~
            [ Multiple-Services-Indicator ]
        * [ Multiple-Services-Credit-Control ]
        ~~* [ Service-Parameter-Info ]~~
            ~~[ CC-Correlation-Id ]~~
            [ User-Equipment-Info ]
        * [ Proxy-Info ]
        * [ Route-Record ]
            [ Service-Information ]
          • [ AVP ]
```

8.2.2 Credit-Control Answer Command

The CCA command is sent from the Charging Enabler to the Charging Enabler User in response to a CCR command and is used in order to authorize and allocate credit for resource usage. This command is used for both Event Based and Session Based responses. The distinction is made accordingly to the value carried in the CC-Request-Type AVP (see Section 8.5.4). The value of this AVP will be the same one contained in the same AVP of the corresponding request.

```
<Credit-Control-Answer> ::= < Diameter Header: 272, PXY >

            < Session-Id >
            { Result-Code }
            { Origin-Host }
            { Origin-Realm }
            { Auth-Application-Id }
            { CC-Request-Type }
            { CC-Request-Number }
            ~~[ User-Name ]~~
            [ CC-Session-Failover ]
            ~~[ CC-Sub-Session-Id ]~~
```

~~[Acct-Multi-Session-Id]~~
~~[Origin-State-Id]~~
~~[Event-Timestamp]~~
~~[Granted-Service-Unit]~~

- [Multiple-Services-Credit-Control]
  [Cost-Information]
  [Low-Balance-Indication]
  ~~[Final-Unit-Indication]~~
  [Check-Balance-Result]
  [Credit-Control-Failure-Handling]
  [Direct-Debiting-Failure-Handling]
  ~~[Validity-Time]~~
- [Redirect-Host]
  [Redirect-Host-Usage]
  [Redirect-Max-Cache-Time]

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

- [AVP]

8.3 Mapping of OMA Charging Data Elements to AVPs

The following table describes the mapping of the OMA Charging Data Elements to the Diameter AVPs.

OMA Charging Data Element	Diameter AVP
Access Network Information	Access-Network-Charging-Identifier-Value
Application Charging Identifier	IMS-Charging-Identifier
Application Server Id	Application-Server-Id
Application Service Type	Application-Service-Type
Application Session Id	Application-Session-Id
Called Party Address	Called-Party-Address
Calling Party Address	Calling-Party-Address
Cause Code	Cause-Code
Check Balance Result [CH-2]	Check-Balance-Result
Content Length	Content-Length
Content Type	Content-Type
Correlation Id	Billing-Information
Cost Information [CH-2]	Cost-Information
Cost Unit [CH-2]	Cost-Unit
Currency Code	Currency-Code
Delivery Status	Delivery-Status
Destination Host [CH-2]	Destination-Host
Destination Realm	Destination-Realm
Event Timestamp	Event-Timestamp
Expires	Expires
Exponent	Exponent
Granted Service Unit [CH-2]	Granted-Service-Unit
Group Name	PoC-Group-Name
Input Octets	Accounting-Input-Octets [CH-1] CC-Input-Octets [CH-2]
Inter-Operator Identifier	Inter-Operator-Identifier
Low Balance Indication [CH-2]	Low-Balance-Indication

OMA Charging Data Element	Diameter AVP
Message Body	Message-Body
Money	CC-Money
Multiple Services Credit Control [CH-2]	Multiple-Services-Credit-Control
Number of Messages Successfully Exploded	Number-of-Messages-Successfully-Exploded
Number of Messages Successfully Sent	Number-of-Messages-Successfully-Sent
Number of participants	Number-of-Participants
Originating IOI	Originating-IOI
Output Octets	Accounting-Output-Octets [CH-1] CC-Output-Octets [CH-2]
Participant Group	Participant-Group
Rating Group	Rating-Group [CH-2]
Reporting Reason	Reporting-Reason [CH-2]
Request Type	Accounting-Record-Type [CH-1] CC-Request-Type [CH-2]
Requested Action [CH-2]	Requested-Action
Requested Service Unit [CH-2]	Requested-Service-Unit
Result code	Result-Code
Role of Node	PoC-Server-Role
Role of User	PoC-User-Role
Service Context Id	Service-Context-Id
Service Identifier	Service-Identifier
Service Key	Service-Key
Service Specific Units	CC-Service-Specific-Units
Session Failover [CH-2]	CC-Session-Failover
Session Id	Session-Id
SIP Method	SIP-Method
SIP Request Timestamp	SIP-Request-Timestamp
SIP Response Timestamp	SIP-Response-Timestamp
Subscription Id	Subscription-Id
Subscription Data	Subscription-Id-Data
Subscription Type	Subscription-Id-Type
Tariff Change Usage	Tariff-Change-Usage [CH2]
Tariff Time Change	Tariff-Time-Change
Terminating IOI	Terminating-IOI
Termination Cause [CH-2]	Termination-Cause
Time	Acct-Session-Time [CH-1] CC-Time [CH-2]
Total Number of Messages Exploded	Total-Number-of-Messages-Exploded
Total Number of Messages Sent	Total-Number-of-Messages-Sent
Total Octets [CH-2]	CC-Total-Octets
Trigger Type	Trigger-Type
Unit Value	Unit-Value
Used Service Unit [CH-2]	Used-Service-Unit
User Equipment Info	User-Equipment-Info
User Equipment Info Type	User-Equipment-Info-Type

OMA Charging Data Element	Diameter AVP
User Equipment Info Value	User-Equipment-Info-Value
Validity Time	Validity-Time
Value Digits	Value-Digits

[CH-1] indicates usage on the offline interface; [CH-2] indicates usage on the online interface.

Table 10: Mapping of OMA Charging Data Elements to Diameter AVPs

8.4 Summary of AVPs used

The following table lists the Diameter AVPs specifically re-used by OMA for the Offline Charging interface (CH-1) and for the Online Charging interface (CH-2).

The table contains the following information:

- AVP Name: The name used in Diameter.
- AVP Code: The AVP Code used in the Diameter AVP Header.
- Used in ACR: Indicates if it is mandatory, optional or not used in the ACR command.
- Used in ACA: Indicates if it is mandatory, optional or not used in the ACA command.
- Used in SI: Indicates if it is mandatory, optional or not used in the Service-Information AVP.
- Used in CCR: Indicates if it is mandatory, optional or not used in the CCR command.
- Used in MSCC CCR: Indicates if it is mandatory, optional or not used in the Multiple-Services-Credit-Control AVP in the CCR command.
- Used in CCA: Indicates if it is mandatory, optional or not used in the CCA command.
- Used in MSCC CCA: Indicates if it is mandatory, optional or not used in the Multiple-Services-Credit-Control AVP in the CCA command.
- AVP Defined: A reference to where this AVP is defined.
- Value Type: The Diameter format of the AVP data as defined in Basic or Derived AVP Data Format.
- AVP Flag Rules: The rules for how the AVP Flags in the AVP Header may be set.
- May Encrypt: Indicates if the AVP may be encrypted or not.

AVP Name	AVP Vendor ID	AVP Code	Used In:							Reference	Value Type	AVP Flag Rules				May Encrypt
			ACR	ACA	SI	CCR	CCR MSCC	CCA	CCA MSCC			Must	May	Should not	Must not	
Access–Network–Charging–Identifier–Value	10415	503	–	–	O	–	–	–	–	[TS29.214]	OctetString	V,M	P	–	–	Y
Accounting–Input–Octets	0	363	–	–	O	–	–	–	–	[RFC4005]	Unsigned64	M	P	–	V	Y
Accounting–Output–Octets	0	364	–	–	O	–	–	–	–	[RFC4005]	Unsigned64	M	P	–	V	Y
Accounting–Record–Number	0	485	M	M	–	–	–	–	–	[RFC3588]	Unsigned32	M	P	–	V	Y
Accounting–Record–Type	0	480	M	M	–	–	–	–	–	[RFC3588]	Enumerated	M	P	–	V	Y
Acct–Application–Id	0	259	O	O	–	–	–	–	–	[RFC3588]	Unsigned32	M	P	–	V	N
Acct–Interim–Interval	0	85	O	O	–	–	–	–	–	[RFC3588]	Unsigned32	M	P	–	V	Y
Acct–Session–Time	0	46	–	–	O	–	–	–	–	[RFC4005]	Unsigned32	M	P	–	V	Y
Application–Server–Id	10415	2101	–	–	O	–	–	–	–	[6.2.4]	UTF8String	V,M	P	–	–	Y
Application–Service–Type	10415	2102	–	–	O	–	–	–	–	[6.2.2]	Enumerated	V,M	P	–	–	Y
Application–Session–Id	10415	2103	–	–	O	–	–	–	–	[6.2.5]	Unsigned32	V,M	P	–	–	Y

AVP Name	AVP Vendor ID	AVP Code	Used In:							Reference	Value Type	AVP Flag Rules				May Encrypt
			ACR	ACA	SI	CCR	CCR MSCC	CCA	CCA MSCC			Must	May	Should not	Must not	
Auth–Application–Id	0	258	–	–	–	M	–	M	–	[RFC3588]	Unsigned32	M	P	–	V	N
Billing–Information	10415	1115	–	–	O	–	–	–	–	[TS29.140]	UTF8String	V,M	P	–	–	Y
Called–Party–Address	10415	832	–	–	O	–	–	–	–	[TS32.299]	UTF8String	V,M	P	–	–	N
Calling–Party–Address	10415	831	–	–	O	–	–	–	–	[TS32.299]	UTF8String	V,M	P	–	–	N
Cause–Code	10415	861	–	–	O	–	–	–	–	[TS32.299]	Integer32	V,M	P	–	–	N
CC–Input–Octets	0	412	–	–	–	–	O	–	O	[RFC4006]	Unsigned64	M	P	–	V	Y
CC–Money	0	413	–	–	O	–	O	–	O	[RFC4006]	Grouped	M	P	–	V	Y
CC–Output–Octets	0	414	–	–	–	–	O	–	O	[RFC4006]	Unsigned64	M	P	–	V	Y
CC–Request–Number	0	415	–	–	–	M	–	M	–	[RFC4006]	Unsigned32	M	P	–	V	Y
CC–Request–Type	0	416	–	–	–	M	–	M	–	[RFC4006]	Enumerated	M	P	–	V	Y
CC–Service–Specific–Units	0	417	–	–	O	–	O	–	O	[RFC4006]	Unsigned64	M	P	–	V	Y
CC–Session–Failover	0	418	–	–	–	–	–	O	–	[RFC4006]	Enumerated	M	P	–	V	Y
CC–Time	0	420	–	–	–	–	O	–	O	[RFC4006]	Unsigned32	M	P	–	V	Y
CC–Total–Octets	0	421	–	–	–	–	O	–	O	[RFC4006]	Unsigned64	M	P	–	V	Y
CC–Unit–Type	0	454	–	–	–	–	–	–	O	[RFC4006]	Enumerated	M	P	–	V	Y
Check–Balance–Result	0	422	–	–	–	–	–	O	–	[RFC4006]	Enumerated	M	P	–	V	Y
Content–Length	10415	827	–	–	O	–	–	–	–	[TS32.299]	Unsigned32	V,M	P	–	–	N
Content–Type	10415	826	–	–	O	–	–	–	–	[TS32.299]	UTF8String	V,M	P	–	–	N
Cost–Information	0	423	–	–	–	–	–	O	–	[RFC4006]	Grouped	M	P	–	V	Y
Cost–Unit	0	424	–	–	–	–	–	–	O	[RFC4006]	UTF8String	M	P	–	V	Y
Credit–Control–Failure–Handling	0	427	–	–	–	–	–	O	–	[RFC4006]	Enumerated	M	P	–	V	Y
Currency–Code	0	425	–	–	O	–	M	–	M	[RFC4006]	Unsigned32	M	P	–	V	Y
Delivery–Status	10415	2104	–	–	O	–	–	–	–	[6.2.16]	UTF8String	V,M	P	–	–	Y
Destination–Host	0	293	–	–	–	O	–	–	–	[RFC3588]	DiamIdent	M	P	–	V	N
Destination–Realm	0	283	M	–	–	M	–	–	–	[RFC3588]	DiamIdent	M	P	–	V	N
Direct–Debiting–Failure–Handling	0	428	–	–	–	–	–	O	–	[RFC4006]	Enumerated	M	P	–	V	Y
Event–Timestamp	0	55	O	O	–	O	–	–	–	[RFC3588]	Time	M	P	–	V	N
Expires	10415	888	–	–	O	–	–	–	–	[TS32.299]	Unsigned32	V,M	P	–	–	N
Exponent	0	429	–	–	O	–	O	–	O	[RFC4006]	Integer32	M	P	–	V	Y
Failed–AVP	0	279	–	–	–	–	–	O	–	[RFC3588]	Grouped	M	P	–	V	N
Final–Unit–Action	0	449	–	–	–	–	–	–	O	[RFC4006]	Enumerated	M	P	–	V	Y
Final–Unit–Indication	0	430	–	–	–	–	–	–	O	[RFC4006]	Grouped	M	P	–	V	Y
Granted–Service–Unit	0	431	–	–	–	–	–	–	O	[RFC4006]	Grouped	M	P	–	V	Y
G–S–U–Pool–Identifier	0	453	–	–	–	–	–	–	O	[RFC4006]	Unsigned32	M	P	–	V	Y
G–S–U–Pool–Reference	0	457	–	–	–	–	–	–	O	[RFC4006]	Grouped	M	P	–	V	Y
IM–Information	10415	2110	–	–	O	–	–	–	–	[6.2.29]	Grouped	V,M	P	–	–	Y
IMS–Charging–Identifier	10415	841	–	–	O	–	–	–	–	[TS32.299]	UTF8String	V,M	P	–	–	N
Inter–Operator–Identifier	10415	838	–	–	O	–	–	–	–	[TS32.299]	Grouped	V,M	P	–	–	N
Low–Balance–Indication	10415	2020	–	–	–	–	–	O	–	[TS32.299]	Grouped	V,M	P	–	–	N
Message–Body	10415	889	–	–	O	–	–	–	–	[TS32.299]	Grouped	V,M	P	–	–	N
Multiple–Services–Credit–Control	0	456	–	–	–	O	–	O	–	[RFC4006]	Grouped	M	P	–	V	Y
Multiple–Services–Indicator	0	455	–	–	–	O	–	–	–	[RFC4006]	Enumerated	M	P	–	V	Y
Number–Of–Messages–Successfully–Exploded	10415	2111	–	–	O	–	–	–	–	[6.2.28]	Unsigned32	V,M	P	–	–	Y
Number–Of–Messages–Successfully–Sent	10415	2112	–	–	O	–	–	–	–	[6.2.29]	Unsigned32	V,M	P	–	–	Y
Number–of–Participants	10415	885	–	–	O	–	–	–	–	[TS32.299]	Unsigned32	V,M	P	–	–	N
Originating IOI	10415	839	–	–	O	–	–	–	–	[TS32.299]	UTF8String	V,M	P	–	–	N
Origin–Host	0	264	M	M	–	M	–	M	–	[RFC3588]	DiamIdent	M	P	–	V	N
Origin–Realm	0	296	M	M	–	M	–	M	–	[RFC3588]	DiamIdent	M	P	–	V	N
Origin–State–Id	0	278	O	O	–	O	–	–	–	[RFC3588]	Unsigned32	M	P	–	V	N
Participant–Group	10415	1260	–	–	O	–	–	–	–	[TS32.299]	Grouped	V,M	P	–	–	N
PoC–Group–Name	10415	859	–	–	O	–	–	–	–	[TS32.299]	UTF8String	V,M	P	–	–	N
PoC–Server–Role	10415	883	–	–	O	–	–	–	–	[TS32.299]	Enumerated	V,M	P	–	–	Y
PoC–User–Role	10415	1252	–	–	O	–	–	–	–	[TS32.299]	Grouped	V,M	P	–	–	Y
Proxy–Host	0	280	M	M	–	M	–	M	–	[RFC3588]	DiamIdent	M	–	–	P,V	N

AVP Name	AVP Vendor ID	AVP Code	Used In:							Reference	Value Type	AVP Flag Rules				May Encrypt
			ACR	ACA	SI	CCR	CCR MSCC	CCA	CCA MSCC			Must	May	Should not	Must not	
Proxy–Info	0	284	O	O	–	O	–	O	–	[RFC3588]	Grouped	M	–	–	P,V	N
Proxy–State	0	33	M	M	–	M	–	M	–	[RFC3588]	OctetString	M	–	–	P,V	N
Quota–Consumption–Time	10415	881	–	–	–	–	–	–	O	[TS32.299]	Unsigned32	V,M	P	–	–	N
Quota–Holding–Time	10415	871	–	–	–	–	–	–	O	[TS32.299]	Unsigned32	V,M	P	–	–	N
Rating–Group	0	432	–	–	–	–	O	–	O	[RFC4006]	Unsigned32	M	P	–	V	Y
Redirect–Address–Type	0	433	–	–	–	–	–	–	M	[RFC4006]	Enumerated	M	P	–	V	Y
Redirect–Host	0	292	–	–	–	–	–	O	–	[RFC3588]	DiamURI	M	P	–	V	N
Redirect–Host–Usage	0	261	–	–	–	–	–	O	–	[RFC3588]	Enumerated	M	P	–	V	N
Redirect–Max–Cache–Time	0	262	–	–	–	–	–	O	–	[RFC3588]	Unsigned32	M	P	–	V	N
Redirect–Server	0	434	–	–	–	–	–	–	O	[RFC4006]	Grouped	M	P	–	V	Y
Redirect–Server–Address	0	435	–	–	–	–	–	–	M	[RFC4006]	UTF8String	M	P	–	V	Y
Reporting–Reason	10415	872	–	–	–	–	O	–	–	[TS32.299]	Enumerated	V,M	P	–	–	N
Requested–Action	0	436	–	–	–	O	–	–	–	[RFC4006]	Enumerated	M	P	–	V	Y
Requested–Service–Unit	0	437	–	–	–	–	O	–	–	[RFC4006]	Grouped	M	P	–	V	Y
Result–Code	0	268	–	M	–	–	–	M	O	[RFC3588]	Unsigned32	M	P	–	V	N
Route–Record	0	282	O	–	–	O	–	O	–	[RFC3588]	DiamIdent	M	–	–	P,V	N
Service–Context–Id	0	461	O	–	–	M	–	–	–	[RFC4006]	UTF8String	M	P	–	V	Y
Service–Generic–Information	10415	1256	–	–	O	–	–	–	–	[8.5.8]	Grouped	V,M	P	–	–	Y
Service–Identifier	0	439	–	–	O	–	O	–	O	[RFC4006]	Unsigned32	M	P	–	V	Y
Service–Information	10415	873	O	–	–	O	–	O	–	[TS32.299]	Grouped	V,M	P	–	–	N
Service–Key	10415	1114	–	–	O	–	–	–	–	[TS29.140]	UTF8String	V,M	–	–	–	Y
Session–Id	0	263	M	M	–	M	–	M	–	[RFC3588]	UTF8String	M	P	–	V	Y
SIP–Method	10415	824	–	–	O	–	–	–	–	[TS32.299]	UTF8String	V,M	P	–	–	N
SIP–Request–Timestamp	10415	834	–	–	O	–	–	–	–	[TS32.299]	Time	V,M	P	–	–	N
SIP–Response–Timestamp	10415	835	–	–	O	–	–	–	–	[TS32.299]	Time	V,M	P	–	–	N
Subscription–Id	0	443	–	–	O	O	–	–	–	[RFC4006]	Grouped	M	P	–	V	Y
Subscription–Id–Data	0	444	–	–	M	M	–	–	–	[RFC4006]	UTF8String	M	P	–	V	Y
Subscription–Id–Type	0	450	–	–	M	M	–	–	–	[RFC4006]	Enumerated	M	P	–	V	Y
Tariff-Change-Usage	0	452	–	–	–	–	–	–	O	[RFC4006]	Enumerated	M	P	–	V	Y
Tariff–Time–Change	0	451	–	–	–	–	–	–	O	[RFC4006]	Time	M	P	–	V	Y
Terminating–IOI	10415	840	–	–	O	–	–	–	–	[TS32.299]	UTF8String	V,M	P	–	–	N
Termination–Cause	0	295	–	–	–	O	–	–	–	[RFC3588]	Enumerated	M	P	–	V	N
Time–Quota–Threshold	10415	868	–	–	–	–	–	–	O	[TS32.299]	Unsigned64	V,M	P	–	–	N
Total–Number–Of–Messages–Exploded	10415	2113	–	–	O	–	–	–	–	[6.2.59]	Unsigned32	V,M	P	–	–	Y
Total–Number–Of–Messages–Sent	10415	2114	–	–	O	–	–	–	–	[6.2.60]	Unsigned32	V,M	P	–	–	Y
Trigger	10415	1264	–	–	–	–	O	–	O	[TS32.299]	Grouped	V,M	P	–	–	N
Trigger–Type	10415	870	–	–	–	–	O	–	O	[TS32.299]	Enumerated	V,M	P	–	–	N
Unit–Quota–Threshold	10415	1226	–	–	–	–	–	–	O	[TS32.299]	Unsigned32	V,M	P	–	–	N
Unit–Value	0	445	–	–	M	–	M	–	M	[RFC4006]	Grouped	M	P	–	V	Y
Used–Service–Unit	0	446	–	–	–	–	O	–	–	[RFC4006]	Grouped	M	P	–	V	Y
User–Equipment–Info	0	458	–	–	O	O	–	–	–	[RFC4006]	Grouped	–	P,M	–	V	Y
User–Equipment–Info–Type	0	459	–	–	M	M	–	–	–	[RFC4006]	Enumerated	–	P,M	–	V	Y
User–Equipment–Info–Value	0	460	–	–	M	M	–	–	–	[RFC4006]	OctetString	–	P,M	–	V	Y
User–Name	0	1	O	O	–	O	–	–	–	[RFC3588]	UTF8String	M	P	–	V	Y
Validity–Time	0	448	–	–	–	–	–	–	O	[RFC4006]	Unsigned32	M	P	–	V	Y
Value–Digits	0	447	–	–	M	–	M	–	M	[RFC4006]	Integer64	M	P	–	V	Y
Volume–Quota–Threshold	10415	869	–	–	–	–	–	–	O	[TS32.299]	Unsigned64	V,M	P	–	–	N

Table 11: Summary of AVPs used on CH-1 and CH-2

8.5 OMA Specific AVP Usage

8.5.1 Acct-Application-Id AVP

Since the protocol used on CH-1 is Diameter Accounting, this AVP shall contain the value of 3 as defined in [RFC3588].

8.5.2 Accounting-Record-Type AVP

The Accounting-Record-Type AVP (AVP Code 480) is of type Enumerated and contains the type of accounting record being sent. The following values are currently defined for the Accounting-Record-Type AVP: EVENT_RECORD (value 1) for an Event Based request, START_RECORD (value 2), INTERIM_RECORD (value 3) and STOP_RECORD (value 4) for a Session Based request.

8.5.3 Auth-Application-Id AVP

Since the protocol used on CH-2 is Diameter Credit Control, this AVP shall contain the value of 4 as defined in [RFC4006].

8.5.4 CC-Request-Type AVP

The CC-Request-Type AVP (AVP Code 416) is of type Enumerated and contains the reason for sending the credit-control request message. It MUST be present in all Credit-Control-Request messages. The following values are defined for the CC-Request-Type AVP: EVENT_REQUEST (value 4) for an Event Based request, INITIAL_REQUEST (value 1), UPDATE_REQUEST (value 2) and TERMINATION_REQUEST (value 3) for a Session Based request.

8.5.5 IM-Information AVP

The IM-Information AVP (AVP code 2110) is of type Grouped. Its purpose is to allow the transmission of service information elements used for IM services.

```
<IM-Information> ::= < AVP Header: 2110 >

                    [ Total-Number-Of-Messages-Sent ]
                    [ Total-Number-Of-Messages-Exploded ]
                    [ Number-Of-Messages-Successfully-Sent ]
                    [ Number-Of-Messages-Successfully-Exploded ]
```

8.5.6 Multiple-Services-Credit-Control AVP

The Multiple-Services-Credit-Control AVP (AVP code 456) is of type Grouped as specified in [RFC4006]. It contains additional 3GPP and OMA specific charging parameters.

```
<Multiple-Services-Credit-Control> ::= < AVP Header: 456 >

            [ Granted-Service-Unit ]
            [ Requested-Service-Unit ]
          * [ Used-Service-Unit ]
            [ Tariff-Change-Usage ]
          * [ Service-Identifier ]
            [ Rating-Group ]
            *[ G-S-U-Pool-Reference ]
            [ Validity-Time ]
            [ Result-Code ]
            [ Final-Unit-Indication ]
            [ Time-Quota-Threshold ]
            [ Volume-Quota-Threshold]
            [ Quota-Holding-Time ]
            [ Quota-Consumption-Time ]
          * [ Reporting-Reason ]
            [ Trigger ]
            *[ AVP ]
```

8.5.7 Requested-Action AVP

The Requested-Action AVP (AVP Code 436) is of type Enumerated and contains the requested action being sent by Credit-Control-Request command where the CC-Request-Type is set to EVENT_REQUEST. The following values are defined for the Requested-Action AVP: DIRECT_DEBITING (value 0) for a Direct Debit Request, REFUND_ACCOUNT (value 1) for a Refund Request, CHECK_BALANCE (value 2), and PRICE_ENQUIRY (value 3) for a Price Enquiry Request.

8.5.8 Service-Context-Id AVP

This AVP is of type UTF8String and contains a unique identifier of the Diameter credit-control service specific document that applies to the request. This is an identifier allocated by the service provider, by the service element manufacturer, or by a standardization body, and must uniquely identify a given Diameter credit-control service specific document.

The format of the Service-Context-Id is:

"extensions"."Release"."service-context" "@" "domain"

The OMA specific value for "domain" is "openmobilealliance.org". The OMA specific values for the "service-context" SHALL be derived from the service enabler names. The service enabler MAY use the "Release" to indicate the OMA Release of the enabler e.g. "1" for version 1.0. Extensions MAY be used to indicate a sub-release or to indicate other implementation details as required. For valid values see section 6.2.42.

8.5.9 Service-Generic-Information AVP

The Service-*Generic*-Information AVP (AVP code 1256) is of type Grouped refer [TS32.299]. Its purpose is to allow the transmission of additional OMA service/enabler specific information elements which are common to different service/enablers.

```
<Services-Generic-Information> ::= < AVP Header: 1256 >

                                  [ Application-Server-ID ]
                                  [ Application-Service-Type ]
                                  [ Application-Session-ID ]
                                  [ Delivery-Status ]
```

8.5.10 Service-Information AVP

The Service-Information AVP (AVP code 873) is of type Grouped. Its purpose is to allow the transmission of additional OMA service/enabler specific information elements.

The complete ABNF syntax is defined and maintained in [TS32.299].

The format and content of the fields inside the OMA specific Service-Information AVP are specified in the documents which are applicable for the specific service/enabler. Note that the formats of the fields are service/enabler-specific, i.e. the format will be different for the various services/enablers.

Appendix A. Change History (Informative)

A.1 Approved Version History

Reference	Date	Description
n/a	n/a	No prior version

A.2 Draft/Candidate Version 1.0 History

Document Identifier	Date	Sections	Description
Draft Versions OMA-DDS-Charging_Data-V1_0	29 Jan 2008	all	Incorporates input from: OMA-MCC-2007-0059R03 OMA-TS-Charging_Offline-V1_0-20070904-A OMA-TS-Charging_Online-V1_0-20070904-A
	27 Feb 2008	6.1 8.1.2 8.1.3 8.2.2 8.2.3	Incorporates CR: OMA-MCC-2008-0020R01
	17 Mar 2008	1 4 5	Incorporates CR: OMA-MCC-2008-0011R01
	30 May 2008	6.2 8.1 8.2 8.3 8.4	Incorporates CR: OMA-MCC-2008-0026R01 OMA-MCC-2008-0028R02
	6 Aug 2008	3.3 4 6.2.3 6.2.48 6.2.49 6.2.52	Incorpoated CR: OMA-MCC-2008-0060r01 OMA-MCC-2008-0061 OMA-MCC-2008-0062r01
	22 Aug 2008	All	Incorporates the following CRs: OMA-MCC-2008-0056R01 OMA-MCC-2008-0070 OMA-MCC-2008-0074
	22 Oct 2008	6 8.3, 8.4	Incorpoated CR: OMA-MCC-2008-0091
	16 Dec 2008	2.2 3.3 4	Incorporated CR: OMA-MCC-2008-0118
	19 Jan 2009	2.1 6.1.1 6.1.3 6.2.36 6.2.38 6.2.39 8.3 8.4 8.5.5 8.5.8	Incorporated CR: OMA-MCC-2009-0002
	17 Feb 2009	All	Editorial clean up
Draft Versions OMA-DDS-Charging_Data-V1_0	10 Mar 2009	n/a	Status changed by TP TP ref# OMA-TP-2009-0098-INP_Charging_Data_V1_0_RRP_for_Candidate_Approval