

# MTAS Advice of Charge Management Guide

## MTAS

---

### USER GUIDE

**Copyright**

© Ericsson AB 2016. All rights reserved. No part of this document may be reproduced in any form without the written permission of the copyright owner.

**Disclaimer**

The contents of this document are subject to revision without notice due to continued progress in methodology, design and manufacturing. Ericsson shall have no liability for any error or damage of any kind resulting from the use of this document.

**Trademark List**

All trademarks mentioned herein are the property of their respective owners. These are shown in the document Trademark Information.



# Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
1.1	Prerequisites	1
<b>2</b>	<b>Overview</b>	<b>3</b>
2.1	Subfunctions	3
2.2	Interaction with Other Services	7
<b>3</b>	<b>AoC Service Configuration</b>	<b>13</b>
3.1	Configuration Activities	13
3.2	AoC Administrative State Configuration	14
3.3	Wholesale for Advice of Charge Configuration	14
3.4	Service Data Configuration	14
<b>4</b>	<b>Performance Management</b>	<b>17</b>
<b>5</b>	<b>Fault Management</b>	<b>19</b>





# 1 Introduction

This document describes how to configure the Advice of Charging (AoC) service in the MTAS.

## 1.1 Prerequisites

It is assumed that the user of this document is familiar with the O&M area, in general.

### 1.1.1 Licenses

To enable the AoC service, the AoC license must be installed.

For more information about the AoC license, refer to *MTAS Licenses*.

### 1.1.2 Documents

Before starting any procedure in this document, ensure that the following documents are available:

- *Ericsson Command-Line Interface User Guide*
- *Managed Object Model (MOM)*

### 1.1.3 Conditions

The following condition must apply:

An Ericsson Command-Line Interface (ECLI) session in Exec mode is in progress.





## 2 Overview

The AoC supplementary service allows the served user to be informed of SIP session-related charging information, refer to the [3GPP TS 32.280 \(V8.1.0\)](#) specification.

The charging information provided to the served user, and the time at which the information is provided, are dependent on the AoC service type. Three AoC service types are available with the service, as follows:

- The AoC Start (AoC-S) service type enables a user to receive information about the applicable charging tariff at communication setup and whenever the applicable tariff changes during the communication.
- The AoC During (AoC-D) service type enables a user to receive information on the cost incurred for a communication upon session establishment, at periodic intervals throughout the communication and when the communication is terminated.
- The AoC End (AoC-E) service type enables a user to receive information on the cost incurred for a communication when the communication is terminated.

Users can be provisioned with any combination of service types. A user provisioned with both the AoC-D and AoC-E service types only receive information once on the recorded cost for the communication when the communication is terminated.

The AoC supplementary service provides AoC information to the served user for information related to a communication session. Depending on the AoC service type, AoC information can be delivered during the session setup, during the active phase, and during the session release.

### 2.1 Subfunctions

The subfunctions included in the AoC service are described in this section.

#### 2.1.1 Populating SIP Messages for User Agent

The AoC data is sent to the User Agent in the body of SIP messages in the form of an AoC XML document. AoC XML instance documents are transported as a SIP MIME body, refer to *MTAS Interface to CSCF (ISC, Ma, Pw)*.

#### 2.1.2 MIME Type and Accept Header

The MIME Type for the AoC information is “application/vnd.etsi.aoc+xml”.

A user who is provisioned with any of the AoC service types must stipulate the MIME Type of “application/vnd.etsi.aoc+xml” in the Accept Header of the SIP INVITE, otherwise the request is rejected with a response code of 406 Not Acceptable. For more information about the MIME Type, refer to *MTAS Interface to CSCF (ISC, Ma, Pw)*.

### 2.1.3 Multiple Versions

Two versions of the AoC XML schema exist. The original version (version “1.0”) is defined by 3GPP and an extended version (version “2”) is defined by TISPAN, refer to the following specifications:

- [3GPP TS 24.647 \(V8.1.0\)](#)
- [ETSI TS 183 043 \(V2.3.1\)](#)

The version of the MIME type indicated in the `sv` or `schemaversion` parameter corresponds with the value of the “version” attribute of the `<schema>` XML element of an AoC XML instance document.

The version of the AoC interface that is used to populate any AoC XML document is determined in accordance with the following rules:

- The MTAS chooses the version specified in the `sv` or `schemaversion` parameter associated with the AoC MIME Type.
- If multiple versions are specified, then the MTAS chooses the highest version that is common with the MTAS-supported versions.
- If the AoC MIME Type is specified without an `sv` or `schemaversion` parameter, then the MTAS assumes version “1.0”.
- If an AoC MIME Type is present with an `sv` or `schemaversion` parameter that is empty, then the request is considered to be invalid and is rejected with a response code of 406 Not Acceptable.

### 2.1.4 Mapping OCS Cost Information – Version 1.0 of AoC Interface

For the AoC-D and the AoC-E, cost information received from the Online Charging System (OCS) is transferred to the User Agent. Cost information received can be expressed in monetary units or in non-monetary units. Cost information received containing a “currency code” represents monetary units and cost information received without a “currency code” represents non-monetary units.

### 2.1.5 Mapping OCS Cost Information – Version 2 of AoC Interface

For the AoC-D and the AoC-E, cost information received from the OCS is transferred to the User Agent. Cost information received can be expressed in





monetary units or in non-monetary units. Cost information received containing a “currency code” represents monetary units and cost information received without a “currency code” represents non-monetary units.

### 2.1.6 Mapping OCS Tariff Information – Version 1.0 of AoC Interface

For the AoC-S, tariff information received from the OCS is transferred to the User Agent. Tariff information received can be expressed in monetary units or in non-monetary units. Tariff information received containing a “currency code” represents monetary units and tariff information received without a “currency code” represents non-monetary units.

The tariff information received from the OCS specifies the current tariff and can include the next tariff together with an indication of when that tariff becomes applicable. When transferring tariff information to the User Agent, the MTAS uses the tariff applicable at that particular time.

### 2.1.7 Mapping OCS Tariff Information – Version 2 of AoC Interface

For the AoC-S, tariff information received from the OCS is transferred to the User Agent. Tariff information received can be expressed in monetary units or in non-monetary units. Tariff information received containing a “currency code” represents monetary units and tariff information received without a “currency code” represents non-monetary units.

The tariff information received from the OCS specifies the current tariff and can include the next tariff together with an indication of when that tariff becomes applicable. When transferring tariff information to the User Agent, the MTAS uses the tariff applicable at that particular time.

### 2.1.8 Determining the AoC Server Address

The MTAS uses the `ecf` parameters received in the P-Charging-Function-Addresses header in the initial INVITE to identify addresses that can be used to communicate with the OCS for AoC purposes, as well as for online credit-control purposes, refer to *MTAS Charging Management Guide*.

The first `ecf` parameter is used as the primary AoC server address. If a second `ecf` parameter is present, it is used as the secondary AoC server address. If the initial INVITE does not contain a P-Charging-Function-Addresses header or contains a header that does not contain any `ecf` parameters, the MTAS uses configured default AoC ECF address information for AoC purposes instead, as follows:

- If both a primary and a secondary AoC ECF address has been configured, the `mtasAocPrimaryEcfAddress` parameter is used as the primary AoC server address and the `mtasAocSecondaryEcfAddress` parameter is used as the secondary AoC server address.



- If only a single AoC ECF address has been configured, the configured parameter, either `mtasAocPrimaryEcfAddress` or `mtasAocSecondaryEcfAddress`, is used as the primary AoC server address.
- If no AoC ECF addresses have been configured, the MTAS rejects the communication session with a failure response of 606 Not Acceptable.

### 2.1.9

#### **Sending Credit Control Request Messages**

The MTAS sends Credit Control Request (CCR) messages to the OCS to obtain tariff information for AOC-S purposes or cost information for AOC-D or AOC-E purposes, or both. The `AoC-Request-Type` AVP is included in all CCR messages generated. The AVP is used to request tariff information for AOC-S purposes and to request cost information for AOC-D and AOC-E purposes. OCS sends tariff information and cost information in Credit Control Answer (CCA) messages to the MTAS. Tariff information consists of the current tariff, and may optionally include the next tariff along with an absolute time at which the tariff is to be changed. Cost information consists of the accumulated cost since the start of the session.

For AOC-S, the following apply:

- A CCR (Initial Request) message requesting tariff information is sent when the SIP `INVITE` request is received.
- A CCR (Update Request) message requesting tariff information is sent on receipt of a provisional response to the SIP `INVITE` request.
- A CCR (Update Request) message requesting tariff information is sent on receipt of a 2xx final response to the SIP `INVITE` request.
- A CCR (Update Request) message requesting tariff information is sent following a successful media change during an established dialog, that is, on receipt of a 2xx final response to the SIP `UPDATE` or `re-INVITE` request.
- A CCR (Update Request) message requesting tariff information is sent shortly after the time for the next tariff has been reached. This is used to obtain a new “next tariff” and a new “tariff change time”.
- A CCR (Termination Request) message is sent at the end of the SIP session.

For AOC-D, the following apply:

- A CCR (Initial Request) message is sent when the SIP `INVITE` request is received.
- A CCR (Update Request) message requesting cost information is sent on receipt of a 2xx final response to the SIP `INVITE` request.



- A CCR (Update Request) message is sent following a successful media change during an established dialog, that is, on receipt of a 2xx final response to the SIP `UPDATE` or `re-INVITE` request.
- A CCR (Update Request) message requesting cost information is sent at regular intervals throughout an established SIP session, controlled by the `mtasAocDuringTimer` attribute.
- A CCR (Termination Request) message requesting cost information is sent at the end of the SIP session.

For AOC-E, the following apply:

- A CCR (Initial Request) message is sent when the SIP `INVITE` request is received.
- A CCR (Update Request) message is sent on receipt of a 2xx final response to the SIP `INVITE` request.
- A CCR (Update Request) message is sent following a successful media change during an established dialog, that is, on receipt of a 2xx final response to the SIP `UPDATE` or `re-INVITE` request.
- A CCR (Termination Request) message requesting cost information is sent at the end of the SIP session.

For details, refer to *Diameter Online Charging in MTAS*.

## 2.2 Interaction with Other Services

The AoC is provided for successfully established communication sessions only and therefore there is no interaction with any services that prevent communication establishment, for example, Communication Barring. The MTAS informs the OCS of supplementary services that are used during a communication session using `Supplementary-Service-Information` Attribute-Value Pairs (AVPs) in Credit Control Request messages, as for online credit-control. The information can be used by the OCS when determining tariffs and costs.

### 2.2.1 Advice of Charge

Any combinations of AoC-S, AoC-D, and AoC-E can coexist.

Where more than one service type applies, a single Advice of Charge session is established with the OCS and is used for all applicable service types.

In cases where a Credit Control Request message would be triggered for more than one service type, for example, upon a successful media change, a single Credit Control Message is sent to the OCS. The `AoC-Request-Type` AVP



is set to meet the combined needs of the applicable service types, refer to *Diameter Online Charging in MTAS*.

The AoC XML document sent in an SIP message can contain AoC-S and AoC-D data. At the end of a SIP session where AoC-D and AoC-E apply, an AoC XML document containing AoC-E information only is sent.

## **2.2.2 Carrier Select and Carrier Pre-Select**

Carrier information is included in the Credit Control Request (Initial Request) sent to the OCS in the `Carrier-Select-Routing-Information` and `Dial-Around-Indicator` AVPs. The information can be used by the OCS when determining tariffs and costs.

For more information about the Carrier Select (CS) and Carrier Pre-Select (CPS) services, refer to *MTAS Carrier Select and Carrier Pre-Select Management Guide*.

## **2.2.3 Communication Diversion**

A diverting user that subscribes to the AoC service does not receive AoC information for communication sessions that are diverted. The MTAS does not initiate an Advice of Charge session with the OCS for the diverted B-to-C leg.

For more information about the Communication Diversion (CDIV) service, refer to *MTAS Communication Diversion Management Guide*.

## **2.2.4 Conference**

The AoC interaction with the conference service is detailed in this section.

For more information about the conference service, refer to *MTAS Ad-hoc Conference Management Guide*.

### **Conference Creator AS**

The communication request generated by an MTAS node serving the conference creator is treated as a normal originating session case, with the following differences:

- The Credit Control Request (CCR) (Update Request) message generated on receipt of the 200 OK (INVITE) response contains the `Conference-Id` AVP (that is, `Conference Focus URI`) and `Supplementary-Service-Information` AVP (indicating `Conference Creation`), as for online credit-control.
- Any subsequent CCR (Update Request) messages contains the `Conference-Id` AVP, as for online credit-control.



- The CCR (Termination Request) message contains the Conference-Id AVP and Supplementary-Service-Information AVP (indicating Conference Completion), as for online credit-control.

For information about online credit-control, refer to *MTAS Charging Management Guide*.

### Conference Focus AS

An MTAS node acting as a Conference Focus does not generate AoC information. The MTAS does not initiate an AoC session with the OCS for the outgoing conference legs.

## 2.2.5 Communication Completion

The AoC for communication sessions that are established by the MTAS for Communication Completion on Busy Service (CCBS) and Communication Completion on No Replay (CCNR) purposes is not supported in the current product version. The MTAS does not initiate an AoC session with the OCS for the MTAS-to-B leg.

For more information about the Communication Completion (CC) service, refer to *MTAS Communication Completion Management Guide*.

## 2.2.6 Online Charging

When the AoC service applies to a communication session that requires online charging, the MTAS uses a single Diameter session with the OCS for both credit-control and Advice of Charge purposes.

The content of Credit Control Request messages sent to the OCS is as described in *Diameter Online Charging in MTAS*.

The following differences apply:

- Any messages sent at points that are common to the trigger points for AoC include the AoC-Request-Type and Preferred-Currency-Code AVPs as specified for the applicable AoC service types.
- When AoC-S is applicable, any Credit Control Request (Update Request) messages sent at points that are specific to credit control include the AoC-Request-Type and Preferred-Currency-Code AVPs as specified for the AoC-S service type.
- When AoC-D or AoC-E are applicable, any Credit Control Request (Termination Request) messages sent at points that are specific to credit control include the AoC-Request-Type and Preferred-Currency-Code AVPs as specified for the applicable AoC service types.



- Any Credit Control Request (Update Request) messages sent at points that are specific to Advice of Charge are as specified for the applicable AoC service types but include a Multiple-Services-Indicator AVP that is set to `Multiple Services Supported`.

The applicability of the AoC service affects the MTAS Online Charging Function behavior in the following aspects:

- The `mtasChargingProfileWaitForCca` CM parameter is used if AoC and Online Charging are active. If this parameter is set, the MTAS waits for the Credit Control Answer (Initial Request) message before allowing the initial INVITE request to be sent.
- The Tx Timer is not used. Instead, the MTAS always waits for Credit Control Answer messages before proceeding.
- The Credit Control Failure Handling (CCFH) action is affected by the `mtasAocTariffFailureAction` or `mtasAocCostFailureAction`, or both, parameters. When a failure occurs, the MTAS terminates the communication session if either the online charging CCFH action is `terminate` or if the failure action configured for a relevant type of AoC is `terminate`.
- When AoC-D or AoC-E are applicable, the MTAS waits for the Credit Control Answer (Termination Request) before sending BYE or 200 OK (BYE) to the AoC user.

For more information about the Charging service, refer to *MTAS Charging Management Guide*.

## 2.2.7 Real-time Transfer of Tariff Information

When the OCS indicates that it needs external tariff information, the MTAS cannot provide tariff information to a subscriber with AoC-S until the external tariff information has been received.

When AoC-S applies, any provisional responses that are received before the external tariff information have been received are passed on to the incoming leg without a CCR (Update Request) message being sent to the OCS.

When AoC-S applies, on receipt of the first provisional response containing external tariff information, the MTAS sends a CCR (Update Request) message to the OCS. The CCR message includes the RTTI tariff information received in the response and includes the `AoC-Request-Type` and `Preferred-Currency-Code` AVPs. On receipt of a successful Credit Control Answer (CCA) response from the OCS containing tariff information, the MTAS passes the provisional response on to the incoming leg with AoC-S data added.

In all cases when the OCS indicates that it needs external tariff information and the information is not received before or in the 200 OK (INVITE) response, the MTAS terminates the charging session and the communication session. This



action is not affected by the setting of the `mtasAocTariffFailureAction` or `mtasAocCostFailureAction` parameters.







## 3 AoC Service Configuration

The AoC is controlled by the *MtasAoc* MO. An overview of the AoC MO structure is shown in Figure 1.

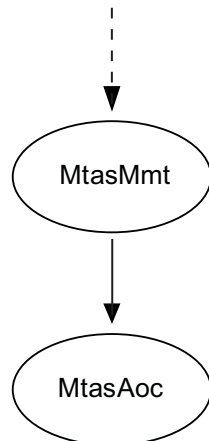


Figure 1 AoC MO Structure

Configurable MOs and attributes related to the AoC service are defined in *Managed Object Model (MOM)*.

### 3.1 Configuration Activities

Extra configuration activities are listed in Table 1.

Table 1 Extra Configuration Activities

Activity	Attribute
Defining the time interval between AoC-During updates during a session.	mtasAocDuringTimer
Defining the default address of the online charging.	mtasAocPrimaryEcfAddress
Defining the secondary address of the online charging server.	mtasAocSecondaryEcfAddress
Uniquely identifying the application that invoked the request, used on the online charging interface.	mtasAocServiceContextId



Activity	Attribute
Defining the required behavior if MTAS cannot provide the user, that is provisioned with the AOC-D service or the AOC-E service, with the cost of the session.	<code>mtasAocCostFailureAction</code>
Defining the required behavior if the MTAS cannot provide the applicable tariff to a user that is provisioned with the Advice of Charge-Start (AOC-S) service.	<code>mtasAocTariffFailureAction</code>

## 3.2 AoC Administrative State Configuration

The AoC service is enabled by setting the `mtasAocAdministrativeState` attribute in the `MtasAoc` MO to 1 (Unlocked). If the `mtasAocAdministrativeState` is set to 0 (Locked), no AoC service is provided by the MTAS.

## 3.3 Wholesale for Advice of Charge Configuration

The AoC service supports Wholesale. AoC is configurable on Virtual Telephony Provider (VTP) level.

Wholesale for AoC is activated when the following attributes are set to 1 (Unlocked):

- The `vtasAocAdministrativeState` attribute in the `VtasAoc` MO
- The `mtasAocAdministrativeState` attribute in the `MtasAoc` MO

For more information about the Wholesale service, refer to *MTAS Wholesale Support Management Guide*.

## 3.4 Service Data Configuration

This section describes how to configure the service data.

### 3.4.1 Operator Subscription Level Service Configuration

The operator can activate or deactivate the AoC (AoC-S, AoC-D, AoC-E) subscription for the subscriber, control the AoC service, and set the preferred currency of the subscribers by setting the user data in the CAI3G protocol, refer to *MTAS CAI3G Interface*.



### **3.4.2 Subscriber Subscription Level Service Configuration**

No service data for the AoC service is configured in the subscriber part of the subscriber data.





## 4 Performance Management

Measurements related to the AoC services are detailed in *Managed Object Model (MOM)*.





## 5 Fault Management

Alarms related to the carrier selection-related services are listed in *MTAS Alarm List*.