

# MTAS Call Admission Control Management Guide

## MTAS

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### USER GUIDE

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# 1 Introduction

This document describes how to configure the User and Group Call Admission Control (UCAC and GCAC) services 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 CAC services, the CAC license must be installed.

For more information about the CAC 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 CAC services consist of UCAC and GCAC and enable admission control of the telephone use for a single user or a group of users.

The CAC services coexist with other simulation services on the same MTAS, for example, Communication Barring (CB) and Hold Communication. The interaction between the CAC and other simulated services is described in this document.

### 2.1 UCAC

The UCAC service enables the operator to restrict the following:

- The number of sessions a served user is involved in
- The number of originating sessions a served user is involved in
- The number of terminating sessions a served user is involved in
- The number of active sessions a served user is involved in
- The number of active originating sessions a served user is involved in
- The number of active terminating sessions a served user is involved in
- The number of waiting sessions a served user has
- The number of fixed active sessions.

The MDUCAC service (UCAC service in Multi-Device mode) enables the operator to restrict the following:

- The number of all sessions a served user is involved in
- The number of mobile sessions a served user is involved in
- The number of fixed sessions a served user is involved in
- The number of a served user's fixed devices engaged in calls

### 2.2 GCAC

The GCAC service provides two options for the specification of the call limits for the CAC group, as follows:

- Specification of the call limits in the XML data for the CAC group



- Specification of the limits in a CAC profile on the MTAS with the CAC group XML data indicating the profile to be used

Specification of the call limits in the XML data enables the operator to restrict the following:

- The number of sessions all the users in the group are involved in
- The number of originating sessions all the users in the group are involved in
- The number of terminating sessions all the users in the group are involved in
- The number of active sessions all the users in the group are involved in
- The number of active originating sessions all the users in the group are involved in
- The number of active terminating sessions all the users in the group are involved in

Specification of the call limits in a CAC profile on the MTAS enables the operator to restrict based on combinations of the following:

- Calls to or from specific destinations, based on number or domain matching (full or partial matching)
- The direction of the call, originating, terminating, or all calls

## 2.3 Change CAC Group Membership

The XML Document Management Server (XDMS) ensures that the identity of a user is added to the list of members in the CAC group data before the group identity is added to the data of the user. The Business Support System ensures that all the users in a group are serviced by the same MTAS.

### 2.3.1 Add a Member to a CAC Group

To achieve collocation of CAC group members, the Business Support System can force deregistration of the new member while the new member is being added to the group. If so, the user is not involved in any CAC countable calls while the data is being changed.

Alternatively, if the new member is already served by the MTAS that serves the group members, the Business Support System layer can add the user to the group while the new member continues to be registered.

The CAC group has a maximum of 50 members.



### 2.3.2 Remove a Member from a CAC Group

The user is not reallocated to another MTAS when it is removed from a group.

## 2.4 Subfunctions

The subfunctions included in the CAC services are described in this section.

### 2.4.1 Reject Originating Communication

The GCAC service checks if calls between two users within a CAC group are to be counted, and also check the user and group counts against the appropriate limits, as configured for the user and group. GCAC limits can be configured in either the GCAC XML data or a CAC profile, indicated to be used for the CAC group. If a limit is exceeded, the CAC services optionally play an announcement, then respond 606 Not Acceptable.

### 2.4.2 Reject Terminating Communication

The GCAC service checks if calls between two users within a CAC group are to be counted, and also checks the user and group counts against the appropriate limits, as configured for the user and group. The GCAC limits can be configured in either the GCAC XML data or a CAC profile, indicated to be used for the CAC group. If a limit is exceeded, the CAC services respond 486 Busy Here, which can be intercepted by other services, such as Communication Waiting (CW) and Communication Diversion (CDIV).

### 2.4.3 Announcements

This subfunction plays audio, video, or audio-video announcements when the CAC service is active.

For more information about announcement handling and attributes for the CAC service, refer to *MTAS Announcement Management Guide*.

## 2.5 Interaction with Other Services

This section describes the CAC interaction with other services.

### 2.5.1 AS Interworking

The Application Server (AS) Interworking service processes all incoming messages, in both directions, before the UCAC service and the GCAC service.



The AS Interworking service processes all outgoing messages, in both directions, after the UCAC service and the GCAC service.

For more information about the AS Interworking service, refer to *MTAS Application Server Interworking Management Guide*.

## **2.5.2 Charging**

For offline charging, the CAC is started by the Supplementary Service Identity included in the ACR event generated for the original session that resulted in the busy response.

For online charging, the CAC is started by the Supplementary Service Identity included in the Credit Control Request (CCR) Terminate Request that is generated for the unsuccessful attempt to establish a communication session.

For more information about the Charging service, refer to the following documents:

- *Diameter Offline Charging in MTAS*
- *Diameter Online Charging in MTAS*

## **2.5.3 Communication Waiting**

### **2.5.3.1 Communication Waiting in Fixed Mode (UCAC)**

The CW service uses the UCAC service when operating in Normal Mode and Alternative Mode 1. It is not possible to provision a user with CW, unless that user has the UCAC service provisioned.

The CW service is started for a terminating served user when the UCAC service determines that the served user is in the Approaching Network Determined User Busy (ANDUB) state.

The UCAC service counts a session as a waiting session if the CW resubmits an initial `INVITE`.

The UCAC service rejects an `INVITE` with Communication Waiting Active (CWA) body included if the served user is not currently involved in an active session. This is applied where the GCAC has rejected the initial `INVITE` as ANDUB, active counts exceeded, but the user is not involved in a session.

### **2.5.3.2 Communication Waiting in Multi-Device Mode (MDUCAC)**

The CW service can be used together with the MDUCAC service when operating in Mobile Mode and Alternative Mode 2.

The MDUCAC service counts a waiting session as an each regular session.



For more information about the CW service, refer to *MTAS Communication Waiting Management Guide*.

#### **2.5.4 Conference**

The CAC services count the session from the Conference Creator to the conference factory as a single originating session.

The CAC services count each session from the conference focus to a Conference Participant (CP) as a single terminating session.

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

#### **2.5.5 Communication Diversion**

The UCAC service does not count sessions diverted by the served user.

The MTAS can be configured to control whether the GCAC service is to count sessions diverted by the served user. When counting diverted sessions, the GCAC service treats the sessions as originating sessions.

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

#### **2.5.6 Flexible Service Format Selection**

The CAC service can be suppressed through Flexible Service Format Selection (FSFS) service. When the FSFS service suppresses the CAC service, the incoming communication is processed as if the CAC service was not active. The user CAC and group CAC can be configured separately to support the FSFS service.

For more information about the FSFS service, refer to *MTAS Flexible Service Format Selection Management Guide*.

#### **2.5.7 Hold Communication**

##### **2.5.7.1 Hold Communication in Fixed Mode (UCAC)**

The CAC service does not count sessions to the active limits where all the previously active media streams have been put on hold.

The CAC service counts sessions to the active limits where any previously held media stream has been resumed. If resuming a stream causes a count of active sessions to exceed its corresponding limit, the Hold Communication service rejects the `re-INVITE` or `UPDATE` with a 606 Not Acceptable final response.



### **2.5.7.2 Hold Communication in Multi-Device Mode (MDUCAC)**

The MDUCAC service counts a held session as a regular session.

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

### **2.5.8 Communication Barring**

The Incoming Communication Barring (ICB) and Outgoing Communication Barring (OCB) services process the initial `INVITE` before the CAC services.

For more information about the CB service, refer to *MTAS Barring and Dial Plan Services Management Guide*.

### **2.5.9 Identity Presentation**

The Identity Presentation services process all provisional and final response messages generated by the CAC services on a Terminating MTAS.

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

### **2.5.10 MMTel**

The MMTel service imposes a limit on the number of sessions a user can be involved in. The CAC limitations are independent of the limit imposed by MMTel, so that the call being admitted by the CAC limit and by the GCAC limit does not ensure that the call is allowed by the MMTel service, and the opposite is also true.

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

### **2.5.11 Supplementary Service Codes**

The UCAC service counts sessions which include a Supplementary Service Code (SSC) in the request URI, even if the session does not send an `INVITE` to another user.

The GCAC service only counts sessions which include an SSC in the request URI if an `INVITE` is sent to another user.

For more information about the SSC service, refer to *MTAS Supplementary Service Codes Management Guide*.



### 2.5.12 Unregistered User

The CAC service counts sessions where the served user is unregistered as a mobile session.

### 2.5.13 Communication Completion

A notification that a Communication Completion (CC) attempt can proceed is made if the UCAC or GCAC indicates that capacity is available for the proposed session.

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

### 2.5.14 Flexible Communication Distribution

The UCAC service counts all distributed legs as a single terminating session. The all-call and active counts are incremented when the initial `INVITE` is handled but the active count is not adjusted, based on the media state, until the 200 OK to the `re-INVITE` is received.

The GCAC service is not compatible with Flexible Communication Distribution (FCD) and both services cannot be concurrently unlocked on the same MTAS node.

For more information about the FCD service, refer to *MTAS Flexible Communication Distribution Management Guide*.





## 3 CAC Services Configuration

The UCAC data and subscriber membership are configured per subscriber data, see Section 3.13 Service Data Configuration on page 25.

The CAC groups are controlled by a combination of MOs and per subscriber data where the group identity is a subscriber. The GCAC per subscriber data can either contain a list of session limits or indicate a profile which is used by this group. GCAC profiles are controlled by MOs.

The MO structure of the CAC services is shown in Figure 1.

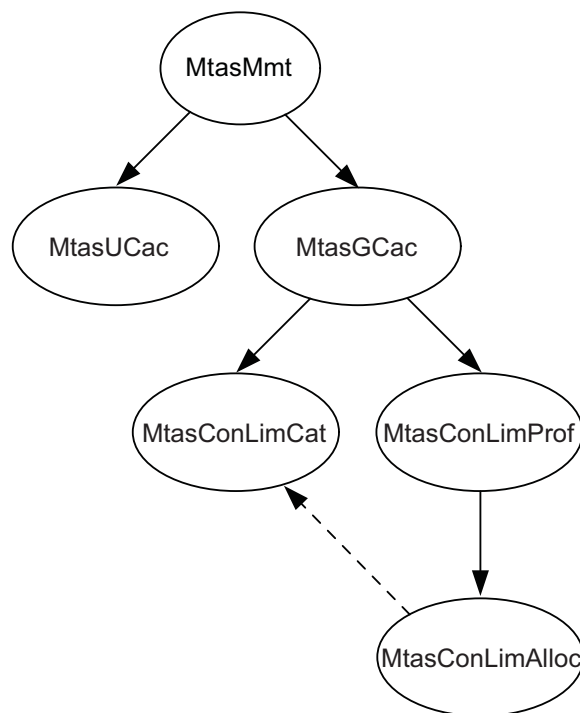


Figure 1 CAC MO Structure

For configurable MOs and attributes related to the CAC services, refer to *Managed Object Model (MOM)*.

### 3.1 Overview Tables and Activation

This section describes the general knowledge needed for handling and activation of tables needed for configuration of the VTP.



### 3.1.1 Select the View and Edit the Standby Tables

In the CM browser, the MTAS offers one active and one standby view. The same MO attribute is used to display both the active and the standby table. By default, the active table is presented.

The view can be changed at any time in the CM browser using the attribute `xView`, where `x` is `mtasConLimCat`. This attribute can have values `0` (Active view) or `1` (Standby view).

Editing of the tables in active view is not allowed. In standby view, however, the standby tables can be edited without affecting the traffic in any way. The changes take effect when the standby tables are activated.

Activation can be done either with immediate effect, see Section 3.1.2 Set and Monitor the Activation State on page 12, or by setting a scheduled change time, see Section 3.1.3 Schedule an Activation on page 13. On activation the active and the standby tables are swapped. The effects of the last activation procedure can be canceled simply by repeating the activation procedure. The new entries become effective in the upcoming new sessions. Before activation, validity checks are executed on the entries.

If a configuration or activation request is rejected because of invalid data, an error with a text pointing out the reason for failure is presented to the user in the CM browser.

### 3.1.2 Set and Monitor the Activation State

The attribute `xActivationState` describes the activation state of the standby dial plan table and can have one of the following values:

<b>0=Idle</b>	This is the default state. There is no operation in progress.
<b>1=Activate</b>	Activation with immediate effect is requested. When the operator sets this state, the values in the standby table become active unless they are invalid. In case of invalid data, the activation request is rejected.
<b>2=Processing</b>	A table copy operation is in progress. During this time editing the entries, changing the activation state, or entering a scheduled change time (see Section 3.1.3 Schedule an Activation on page 13) is disabled. When the operation is finished, the state is changed automatically to <code>0=Idle</code> .
<b>3=CopyToStandby</b>	Starts an asynchronous operation which copies the entries from the active table to the standby table. The values previously stored in the standby table are overwritten.



An activation with immediate effect can be triggered by setting `xActivationState` to `1=Activate`. While loading the data, incoming traffic requests are queued. The requests are answered when the data is fully loaded. In addition, the MTAS offers a functionality which copies the active entries to the standby table (see state `3=CopyToStandby`) as a preparation for changing the currently active entries. This operation does not affect the traffic in any way but it implicitly cancels any scheduled activation.

### 3.1.3 Schedule an Activation

The attribute `xChangeTime` can be used to define a time point in the future when the standby table is activated. By default `xChangeTime` is set to empty string, meaning that no change is scheduled.

The format used to specify a valid change time is: `YYYY-MM-DDThh:mm:ss` (see ISO 8601:2004(E)). For example: the value `2011-07-23T18:15:00` schedules changing the active table at 18:15:00 on 23 of July, 2011.

An activation can be scheduled only in state `0=Idle`. The execution time is limited to two weeks. When `xChangeTime` is set to a valid time in the future and the current standby entries are valid, a change is scheduled, otherwise the configuration attempt is rejected.

The scheduled activation is handled similar to setting `xActivationState` to `1=Activate` with the only difference that the standby table does not become effective immediately but later.

A scheduled activation can be canceled by setting `xChangeTime` to the empty string at any time. Setting `xChangeTime` to a valid time in the future reschedules the activation.

While the data is loading, the activation state is changed automatically to `2=Processing`. Canceling or rescheduling activation is not possible when the loading of the data has started. When the data is fully loaded, `xChangeTime` is set back to empty string.

### 3.1.4 Impact of Dropback Attribute on `vtasXxx` Standby and Active Tables

If the dropback attribute of a `vtasXxx` table changes from 1 (OTP values) to 0 (VTP values), then both the active and the standby `vtpTables` are replaced with their `otpTable` pair. The original values of the `vtpTables` cannot be restored and the `xChangeTime` value is replaced. The copy is performed only if it results in a valid state, otherwise the dropback attribute cannot be changed.

## 3.2 Identity in CAC Group Profile Categories

The URIs `sip:+4981770124@example.com;user=phone` and `sip:+4981770124@example.com` are different addresses, and cannot



be assumed to relate to the same user. The inclusion of the `user=phone` parameter indicates that the URI is a tel: URI that has been converted to a SIP URI whereas the URI without a `user=phone` parameter is a standard SIP name address, in accordance with [Section 19.1.6 in RFC 3261, SIP: Session Initiation Protocol](#).

### 3.2.1 CAC Group Profile Category Matching

The format of the URI defines which Profile Category is used when fulfilling the GCAC Service.

When the URI contains a standard SIP name address, the domain Category `mtasConLimCatDomain` is applied to find a match. If the URI contains a phone number, the included/excluded numbers Category `mtasConLimCatNumIncluded` is used.

An example of how this matching behavior can be used is shown in Table 2.

## 3.3 Configure a GCAC Category

The following sections describe how to create, modify, and delete a GCAC Category.

### 3.3.1 Create a Group Profile Category

**Note:** The MTAS stores one active and one standby table for each MO. Both the active and the standby table is accessible at any time. Changing the entries is possible only in the standby table. Changes become effective for new sessions after the standby table is activated.

See Section 3.1 Overview Tables and Activation on page 11 for details on selecting and editing the tables.

To create a Group Profile Category:

1. Navigate to the *MtasGCac* MO, see Figure 1 for where it is placed in the MO hierarchy.
2. Right-click **MtasGCac** and click **New** in the pop-up menu. This results in the **Set Entry Object Classes** window.
3. If there are any classes in the **Selected Classes** field, select them and click **Remove**.
4. Select *MtasConLimCat* from the alphabetic list in the **Available Classes** field.
5. Enter the Relative Distinguished Name (RDN), for example, `MtasConLimCat=international`, and click **Add**. The RDN for



**MtasConLimCat** must be a string of up to 32 characters but must not be the reserved names `*`, `Local`, or `Non Local`.

6. Click **OK**.

A new **MtasConLimCat** MO is displayed in the CM browser.

7. In the **Table Editor** window, set the attribute `mtasConLimCatNumIncluded` to a list of strings.

Each entry in the list of strings is shown by a separate row in the **Table Editor** window.

8. To add an entry to the list, right-click the attribute name and select **Add Another Value** from the pop-up menu.

This results in another row in the **Table Editor**, labeled **mtasConLimCatNumIncluded**. Each string is the leftmost part of a set of telephone numbers that are to be included in a GCAC count which uses this category. For example, `+447` would match mobile numbers in the UK, and `150` would match operator inquiry numbers.

9. In the **Table Editor** window, set the attribute `mtasConLimCatNumExcluded` to a list of strings.

Each entry in the list of strings is shown by a separate row in the **Table Editor** window.

10. To add an entry to the list, right-click the attribute name and select **Add Another Value** from the pop-up menu.

This results in another row in the **Table Editor** window, labeled **mtasConLimCatNumExcluded**. Each string is the leftmost part of a set of telephone numbers that are to be excluded from being counted by a GCAC profile count which uses this category. Each excluded string begins with one of the number strings in this Category. For example, `+4476` would match pager numbers in the UK, and `150;phone-context=company.com` would match the inquiry number of the company.

11. In the **Table Editor** window, set the attribute `mtasConLimCatDomain` to a list of strings.

Each entry in the list of strings is shown by a separate row in the **Table Editor** window.

12. To add an entry to the list, right-click the attribute name and select **Add Another Value** from the pop-up menu.

This results in another row in the **Table Editor**, labeled **mtasConLimCatDomain**.

Each string is all or part of the domain name part of a user identity from a SIP URI. If the leftmost character is a `*`, then it is treated as a wildcard and



the input string, excluding the \*, is matched with the rightmost part of the domain name from the SIP URI. If the leftmost character is not \*, then the entry only matches a fully qualified domain name. For example, \*de would match any domain name which ended in de but home.mynetwork.de would only match a user identify with the fully qualified domain name home.mynetwork.de.

13. Click **Submit**.

### 3.3.2 Modify a Group Profile Category

**Note:** The MTAS stores one active and one standby table for each MO. Both the active and the standby table is accessible at any time. Changing the entries is possible only in the standby table. Changes become effective for new sessions after the standby table is activated.

See Section 3.1 Overview Tables and Activation on page 11 for details on selecting and editing the tables.

To modify a Group Profile Category:

1. Navigate to the **MtasConLimCat** MO.
2. Select the instance of **MtasConLimCat** to be modified.
3. In the **Table Editor** window, modify the attributes as required.
  - To add an entry to **mtasConLimCatNumIncluded**, **mtasConLimCatNumExcluded** or **mtasConLimCatDomain**, right-click the attribute name and select **Add Another Value** from the pop-up menu.

This results in another row in the **Table Editor** window, labeled appropriately.
  - To delete an entry from **mtasConLimCatNumIncluded**, **mtasConLimCatNumExcluded**, or **mtasConLimCatDomain**, right-click the attribute name and select **Delete** from the pop-up menu.

This results in the selected row being removed from the **Table Editor** window.
  - To modify an attribute, select the contents of the field to be changed and type the new value into the field.
4. Click **Submit**.



### 3.3.3 Delete a Group Profile Category

**Note:** The MTAS stores one active and one standby table for each MO. Both the active and the standby table is accessible at any time. Changing the entries is possible only in the standby table. Changes become effective for new sessions after the standby table is activated.

See Section 3.1 Overview Tables and Activation on page 11 for details on selecting and editing the tables.

To delete a Group Profile Category:

1. Navigate to the **MtasConLimCat** MO.
2. Right-click the instance of **MtasConLimCat** to be deleted, and select **Delete** in the pop-up menu.

## 3.4 Configure a GCAC Profile

The following sections describe how to create or delete a Group Profile.

### 3.4.1 Create a Group Profile

To create a Group Profile:

1. Navigate to the **MtasGCac** MO, see Figure 1 for where it is placed in the MO hierarchy.
2. Right-click **MtasGCac** and click New in the pop-up menu. The **Set Entry Object Classes** window is displayed.
3. If there are any classes in the **Selected Classes** field, select them and click **Remove**.
4. Select **MtasConLimProf** from the alphabetic list in the **Available Classes** field.
5. Enter the RDN, for example, **MtasConLimProf=Profile1**, and click **Add**. The RDN for **MtasConLimProf** must be a string with a maximum of 32 characters.
6. Click **OK**. A new *MtasConLimProf* MO is displayed in the CM browser.
7. Click **Submit**.

### 3.4.2 Delete a Group Profile

To delete a **Group Profile**:

1. Navigate to the **MtasConLimProf** MO.



2. Right-click the instance of **MtasConLimProf** to be deleted, and select **Delete** in the pop-up menu.

### 3.4.3

#### GCAC Profile Examples

This section shows examples of configuration for categories and profiles for customers in Stockholm in Sweden.

##### MtasConLimitCategory

Up to 50 categories can be defined for the `MtasConLimitCategory` MO.

For `MtasConLimitCategory` = International, see Table 1.

*Table 1 MtasConLimitCategory = International*

Attribute	Value
mtasConLimCatNumIncluded	+
mtasConLimCatNumExcluded	+46
mtasConLimCatDomain	

Includes all international numbers except the numbers in Sweden. The “+” in the included number field includes all international telephone numbers. The “+46” in the excluded numbers means that calls to Sweden are not counted by this category.

For `MtasConLimitCategory` = National, see Table 2.

*Table 2 MtasConLimitCategory = National*

Attribute	Value
mtasConLimCatNumIncluded	+46
mtasConLimCatNumExcluded	
mtasConLimCatDomain	*.se

This data defines “national” calls within Sweden. The “+46” defines calls to Sweden. The domain “\*.se” (\* is a wildcard which indicates that any domain ending in “.se” ) is included as it is possible to call subscribers using sip names within the “.se” domain.

For `MtasConLimitCategory` = OutsideEurope, see Table 3.

*Table 3 MtasConLimitCategory = OutsideEurope*

Attribute	Value
mtasConLimCatNumIncluded	+



Attribute	Value
mtasConLimCatNumExcluded	+3, +4
mtasConLimCatDomain	

This category defines calls which are outside Europe. European calls can be identified as the Country Codes begin with either “3” or “4”.

### MtasConLimProf

Up to 50 Profiles can be defined for the *MtasConLimProf* MO.

Profile configuration examples are shown in Table 4.

*Table 4 Example Profile Configurations*

MtasConLimProf = Sweden1
MtasConLimProf=SwedenLimited

### MtasConAlloc

Up to 16 specific limits can be specified in each Profile for the *MtasConAlloc* MO.

For *MtasConAlloc* = 0-SwedenLimited, see Table 5.

*Table 5 MtasConAlloc = 0-SwedenLimited*

Attribute	Value
mtasConAllocCategory	*
mtasConAllocDirection	*
mtasConAllocMedia	*
mtasConAllocLimit	20

Limits the total number of calls for each CAC Group using the Profile “SwedenLimited” to a maximum of 20 calls irrespective of incoming or outgoing and irrespective of remote party.

For *MtasConAlloc* = 1-SwedenLimited, see Table 6.

*Table 6 MtasConAlloc = 1-SwedenLimited*

Attribute	Value
mtasConAllocCategory	International
mtasConAllocDirection	orig



Attribute	Value
mtasConAllocMedia	*
mtasConAllocLimit	3

Limits the number of calls for each CAC Group using the Profile “SwedenLimited” to international destinations to a maximum of three originating calls.

For MtasConAlloc = 2-SwedenLimited, see Table 7.

*Table 7 MtasConAlloc = 2-SwedenLimited*

Attribute	Value
mtasConAllocCategory	International
mtasConAllocDirection	term
mtasConAllocMedia	*
mtasConAllocLimit	5

Limits the number of calls for each CAC Group using the Profile “SwedenLimited” from international destinations to a maximum of five terminating calls.

For MtasConAlloc = 3-SwedenLimited, see Table 8.

*Table 8 MtasConAlloc = 3-SwedenLimited*

Attribute	Value
mtasConAllocCategory	National
mtasConAllocDirection	orig
mtasConAllocMedia	*
mtasConAllocLimit	15

Limits the number of calls for each CAC Group using the Profile “SwedenLimited” to national destinations to a maximum of 15 originating calls.

For MtasConAlloc = 4-SwedenLimited, see Table 9.

*Table 9 MtasConAlloc = 4-SwedenLimited*

Attribute	Value
mtasConAllocCategory	National
mtasConAllocDirection	term
mtasConAllocMedia	*
mtasConAllocLimit	15



Limits the number of calls for each CAC Group using the Profile “SwedenLimited” from national destinations to a maximum of 15 terminating calls.

For MtasConAlloc = 5-SwedenLimited, see Table 10.

*Table 10 MtasConAlloc = 5-SwedenLimited*

Attribute	Value
mtasConAllocCategory	OutsideEurope
mtasConAllocDirection	*
mtasConAllocMedia	*
mtasConAllocLimit	2

Limits the number of calls for each CAC Group using the Profile “SwedenLimited” to a maximum of two calls from outside Europe irrespective of direction.

*Impact of the Profile SwedenLimited*

The CAC Groups which use the “SwedenLimited” Profile are limited to a maximum of 20 calls irrespective of direction. These 20 calls can be made up of up to 15 incoming or up to 15 outgoing calls, three originating international calls, and five terminating international calls of which only two can be to or from outside Europe.

For MtasConAlloc = 0-Sweden1, see Table 11.

*Table 11 MtasConAlloc = 0-Sweden1*

Attribute	Value
mtasConAllocCategory	International
mtasConAllocDirection	*
mtasConAllocMedia	*
mtasConAllocLimit	10

Limits the number of calls for each CAC Group using Profile “Sweden1” to a maximum of 10 international calls irrespective of direction.

For MtasConAlloc = 1-Sweden1, see Table 12.

*Table 12 MtasConAlloc = 1-Sweden1*

Attribute	Value
mtasConAllocCategory	OutsideEurope
mtasConAllocDirection	orig



Attribute	Value
mtasConAllocMedia	*
mtasConAllocLimit	5

Limits the number of calls for each CAC Group using Profile “Sweden1” to a maximum of five originating calls to destinations outside Europe.

#### *Impact of the Profile Sweden1*

The CAC Groups which use the “Sweden1” Profile have no limit on the maximum number of originating or terminating calls the members of the group can have. The only limits in this profile are the number of international calls with a maximum of 10 calls, irrespective of direction of which only five can be originating calls to destinations outside Europe.

## 3.5 Configure a Connection Allocation

The following sections describe how to create, modify, and delete a Connection Allocation.

### 3.5.1 Create a Connection Allocation

To create a Connection Allocation:

1. Navigate to the **MtasConLimProf** MO, refer to Figure 1 for where it is placed in the MO hierarchy.
2. Right-click **MtasConLimProf** and click **New** in the pop-up menu. This results in the **Set Entry Object Classes** window.
3. If there are any classes in the **Selected Classes** field, select them and click **Remove**.
4. Select **MtasConAlloc** from the alphabetic list in the **Available Classes** field.
5. Enter the RDN, for example, **MtasConAlloc=0-Profile1**, and click **Add**. The RDN for **MtasConAlloc** must be an integer in the range of 0 to 15, followed by a -, followed by the RDN of the parent **MtasConLimProf** MO.
6. Click **OK**.

A new **MtasConAlloc** MO is presented in the CM browser.

7. In the **Table Editor** window, set the attribute **mtasConAllocCategory** to either \* (limit applies to all calls) or to an instance of **MtasConLimCat**. Enter the name used to identify the **MtasConLimCat** instance.



8. In the **Table Editor** window, set the attribute **mtasConAllocDirection** to either `orig` (for originating calls), `term` (for terminating calls) or `*` (for both Originating and Terminating calls).
9. In the **Table Editor** window, set the attribute **mtasConAllocMedia** to a `*`, indicating that session is to be counted irrespective of media type.
10. In the **Table Editor** window, set the attribute **mtasConAllocLimit** to the number of active calls which are permitted for each CAC group which use this profile where the **mtasConAllocCategory**, **mtasConAllocDirection**, and **mtasConAllocMedia** attributes match the session parameters.
11. Click **Submit**.

### 3.5.2 Modify a Connection Allocation

To modify a Connection Allocation:

1. Navigate to the **MtasConAlloc** MO.
2. Select the instance of **MtasAlloc** to be modified.
3. In the **Table Editor** window, modify the **mtasConAllocCategory**, **mtasConAllocDirection**, and **mtasConAllocLimit** attributes as required.
4. Click **Submit**.

### 3.5.3 Delete a Connection Allocation

To delete a Connection Allocation:

1. Navigate to the **MtasConAlloc** MO.
2. Right-click the instance of **MtasConAlloc** to be deleted, and select **Delete** in the pop-up menu.

## 3.6 Reset GCAC Counts

If it becomes necessary to reset the group counts for GCAC, this can be achieved on a per CAC group basis by using the CAI3G interface to set the `<group-call-admission-control> <activated>` attribute to `false`. This has the effect of resetting all the call counts for the CAC group to 0. Any calls which begin setup while this flag is set to `false` are not counted to the GCAC call limits. Setting this attribute back to `true` results in any new calls being counted to the GCAC call limits.

If there were established sessions at the time of the reset of the GCAC counts, then the number of permitted sessions exceed the permitted session limits until there is a period when there are no established sessions for the group. The maximum number of additional sessions, above those permitted for the group, is the number of established sessions in progress at the time the count reset occurred.



### 3.7 Initial Filter Criteria for Subscribers with GCAC Service Configuration

All users who belong to a CAC group must have their services delivered by the same MTAS.

The Initial Filter Criteria for all users belonging to the same CAC group must be configured so that when the user registers in the IMS, the same MTAS is chosen to provide the GCAC service for the user as for all other members of the same CAC group.

The mechanism for setting this data varies depending on network configuration and the mechanisms used in the specific network.

### 3.8 Announcement Configuration

The CAC services play an audio or video announcement, or both, to indicate to the caller, for example, when the communication has been rejected or a limit has been exceeded.

For information on announcement handling and CAC announcement attributes, refer to *MTAS Announcement Management Guide*.

### 3.9 Additional Configuration

Additional configuration activities are listed in Table 13.

**Note:** Not all CAC configuration activities are listed in Table 13.

*Table 13 Additional Configuration Activities*

Activity	Attribute
Controlling whether the GCAC service counts sessions directly between two members of the same CAC group.	mtasGCacCountIntraGroup
Controlling whether the GCAC service counts sessions diverted by the served user.	mtasGCacCountDivertedBy

For more information about the CAC attributes, refer to *Managed Object Model (MOM)*.



## 3.10 UCAC Administrative State Configuration

The UCAC service is enabled by setting the `mtasUCacAdministrativeState` attribute in the *MtasUCac* MO to 1 (Unlocked). If the `mtasUCacAdministrativeState` is set to 0 (Locked), no UCAC service is provided by the MTAS.

## 3.11 GCAC Administrative State Configuration

The GCAC service is enabled by setting the `mtasGCacAdministrativeState` attribute in the *MtasGCac* MO to 1 (Unlocked). If the `mtasGCacAdministrativeState` is set to 0 (Locked), no GCAC service is provided by the MTAS.

## 3.12 Wholesale for CAC Configuration

Both the UCAC service and the GCAC service support Wholesale. The UCAC and the GCAC are configurable on Virtual Telephony Provider level.

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

### 3.12.1 Wholesale for UCAC Configuration

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

- The `vtasUCacAdministrativeState` attribute in the *VtasUCac* MO
- The `mtasUCacAdministrativeState` attribute in the *MtasUCac* MO

### 3.12.2 Wholesale for GCAC Configuration

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

- The `vtasGCacAdministrativeState` attribute in the *VtasGCac* MO
- The `mtasGCacAdministrativeState` attribute in the *MtasGCac* MO

## 3.13 Service Data Configuration

This section describes how to configure the service data.



### 3.13.1 Relationship Group Profile, Category, and Connection Allocation

A Group Profile allows the network operator to configure a set of parameters and limits for active and held sessions and then use this profile with many different CAC groups. The relationship between a CAC group and a CAC Profile is configured in the CAC group subscriber data.

The Group Profile can have up to 16 connection allocations which specify a limit to the number of active calls based on the identity of the remote user and the direction of the call. The direction is specified as originating (`orig`) or terminating (`term`). The remote identity is specified by associating a category with a connection allocation limit. If the connection allocation limit is to apply to all sessions irrespective of remote identity, the associated category is specified as `“*”`.

A GCAC Category contains a list of number prefixes that are to be included in the identity category and a list of number prefixes which are excluded. This allows entry of parts of included ranges which are not to be included in this category, for example, a category which counts international calls but not those to or from Germany could have as its included numbers just a `“+”` (which includes all numbers in global format) but have an excluded number of `“+49”` which would exclude identities with global number which begin with `“+49”` from being counted by any Group Profile connection allocation.

A GCAC Category can also contain a list of domain names to be included in the category. These can be specified either as a fully qualified domain name or as the rightmost part of the domain name. To specify that only the rightmost part is to be used, the first character in the domain name string is entered as `“*”`. If `“*”` is not the first character, then the entered string is considered to be a fully qualified domain name.

### 3.13.2 Operator Subscription Level Service Configuration

The operator can activate or deactivate the UCAC and GCAC services subscription for the subscriber, add a membership of a user to a CAC group, and set the limits by setting the user data using the CAI3G protocol. The XDMS checks that the structure in the XML files match the schemas.

For more information about the CAI3G protocol, refer to *MTAS CAI3G Interface*.

### 3.13.3 Subscriber Subscription Level Service Configuration

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



## 4 Performance Management

The following section describes the PM counters and the reject information logging.

### 4.1 PM Counters

For information on measurements, related to the CAC service, refer to *Managed Object Model (MOM)*.

### 4.2 Reject Information Logging

The logging enables the administrator to collect detailed information about the CAC service state if a call is rejected by the service. It provides information about subscribers being affected and helps to detect the invalid call rejections. An invalid rejection can happen when the defined limits are not aligned with the expected behavior.

The feature is configurable as a normal application trace. The log is stored into the system applog.

There are two specific levels for rejection logging:

- Outgoing call rejection

When `ims.mtas.services.cac` trace domain selected and the trace level is `MINOR (39)`, the information about rejected outgoing calls is logged.

- Incoming (486) and outgoing (606) call rejection

When `ims.mtas.services.cac` trace domain selected and the trace level is `MINOR_LOW (40)` or above, the information about rejected incoming and outgoing calls is logged.

For more information, refer to *MTAS AppTrace*.

The log consists of three parts: title, general information, and UCAC/GCAC specific information.

#### **Title**

The title contains information if the UCAC or GCAC service caused the rejection.

#### **General Part**



The general part contains information about the subscriber and the SIP event that was rejected by the CAC service, as follows:

- Reject response

It is 606 for outgoing rejected calls and 486 for incoming rejected calls.

- Time stamp

This is the date and time when the reject happened in the following format:  
YYYY-MM-DD HH:MM:SS.fff

- Served user

URI of the served user

- Session case

It can contain the followings: `ORIGINATING`, `TERMINATING`, or, `TRANSIT` depending on the MTAS node role for the served user.

- Mode type

It can be `USER CAC` or `GROUP CAC` depending on `UCAC` or `GCAC` counters caused the rejection.

- Event info

Some information about the event that is rejected: method, request URI, from, to, call-id.

- Response code

Response code of the CAC service. This can be the following cases:

REJECT_ANDUB_USER	Terminating - Approaching User Network Busy owing to User limits
REJECT_ANDUB_GROUP	Terminating - Approaching User Network Busy owing to Group limits
REJECT_NDUB_USER	Terminating - User Network Busy owing to User limits
REJECT_NDUB_GROUP	Terminating - User Network Busy owing to Group limits
REJECT_USER	Originating - Reject owing to User limits
REJECT_GROUP	Originating - Reject owing to Group limits
DISALLOW_INSUFF_USER	Disallow - User has insufficient resources owing to User limits
DISALLOW_INSUFF_GROUP	Disallow - User has insufficient resources owing to Group limits



### UCAC Specific Part

When the mode type is USER CAC, the UCAC-specific part is logged. It contains the current and the specified limit UCAC values, as follows:

ucacOrigAllCount	All originating calls count
ucacOrigAllLimit	All originating calls limit
ucacOrigActiveCount	Active originating calls count
ucacOrigActiveLimit	Active originating calls limit
ucacTermAllCount	All terminating calls count
ucacTermAllLimit	All terminating calls limit
ucacTermActiveCount	Active terminating calls count
ucacTermActiveLimit	Active terminating calls limit
ucacWaitingCount	Hold calls count
ucacWaitingLimit	Hold calls limit
ucacTotalActiveLimit	All active calls limit
ucacTotalAllLimit	All calls limit

### MDUCAC Specific Part

When the mode type is MULTI-DEVICE USER CAC, the MDUCAC-specific part is logged. It contains the current and the specified limit UCAC values, as follows:

mducacAllCount	All calls count
mducacAllLimit	All calls limit
mducacMobileCount	Mobile calls count
mducacMobileLimit	Mobile calls limit
mducacFixedCount	Fixed calls count
mducacFixedLimit	Fixed calls limit
mducacSimultaneousDeviceUsageCount	Number of fixed devices used at the time
mducacSimultaneousDeviceUsageLimit	Limit of fixed devices used at the time

### GCAC Specific Part

When the mode type is GROUP CAC, the GCAC-specific part is logged, as follows:

- Group identity



It contains the identity of the group.

- Profile used

Yes if GCAC profile defined, otherwise no.

When the profile is not used, the following is logged:

gcacOrigAllCount	All originating calls count
gcacOrigAllLimit	All originating calls limit
gcacOrigActiveCount	Active originating calls count
gcacOrigActiveLimit	Active originating calls limit
gcacTermAllCount	All terminating calls count
gcacTermAllLimit	All terminating calls limit
gcacTermActiveCount	Active terminating calls count
gcacTermActiveLimit	Active terminating calls limit
gcacTotalActiveLimit	All active calls limit
gcacTotalAllLimit	All calls limit

When the profile is used, name of the profile, profile allocation count, limit, and media logged. The maximum number of allocations is 15. If the limit is zero, the allocation is not printed.

The value of the media can be \*, AUDIO, or VIDEO.



## 5 Fault Management

For information on alarms, related to the CAC services, refer to *MTAS Alarm List*.