

# MTAS Communication Waiting Management Guide

## MTAS

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### USER GUIDE

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# 1 Introduction

This document describes how to configure the Communication Waiting (CW) 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 basic services in the MTAS, the MMTel AS Voice Base license must be installed.

For more information about the MMTel AS Voice Base 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 Communication Waiting service allows a user to be notified of incoming calls when they are involved in other communication sessions.

The MTAS supports the following five separate modes for Communication Waiting:

- Normal Mode – Supports Network and User determined CW
- Alternative Mode 1 – Supports Network and User determined CW and differs from normal mode in the announcement signaling
- Alternative Mode 2 – Supports User determined CW, signaled by a 182 Queued provisional response
- Mobile CW Mode – Supports user determined CW
- Mobile CWI Alternative Mode 1 – Supports user determined CW with CWI indication

### 2.1 Normal Mode and Alternative Mode 1

In normal mode and Alternative mode 1, the CW function works with the Call Admission Control (CAC) service, which determines if the served user is in the Approaching Network Determined User Busy (ANDUB) state, refer to *MTAS Call Admission Control Management Guide*.

If so, and the served user has an active subscription to CW, the CW function includes a Communication Waiting Active (CWA) indicator in the `INVITE` request.

The CW function then waits for a response to the `INVITE` request.

Upon receipt of a 180 Ringing provisional response to the `INVITE` request, the CW function determines if CW has been used for the subscriber with the CW service active. The reasons can be the following:

- ANDUB for the served user was determined at the outgoing `INVITE`

or

- ANDUB was not determined for the served user but a CW Used (CWU) Alert-info header is received in the 180 Ringing response (User CW)



## 2.2 Alternative Mode 2

In Alternative mode 2, the `INVITE` request is sent to the served user without change. The CW function then waits for a response to the `INVITE` request. When receiving a 182 Queued provisional response to the `INVITE` request, the CW function determines that CW has been used for the subscriber with the CW service active.

## 2.3 Mobile CW Mode

In Mobile CW Mode, the `INVITE` request is sent to the served user without change. The CW function then waits for a response to the `INVITE` request. Upon receipt of a 180 Ringing response (including CWU in the Alert Info header) to the `INVITE` request, the CW function determines that CW has been used for the subscriber with the CW service active and starts a timer.

The served user can accept the call within this time (200 OK). If this timer expires, then the call attempt is stopped.

## 2.4 Mobile CW Alternative Mode 1

In Mobile CW Alternative Mode 1, the CW function adds CWI (Communication Waiting Indication) to the `INVITE` request if the served user already is in an active communication session (independent of the number of waiting sessions).

CWU handling is not supported in this mode.

The CAC function ignores the CWI indication.

## 2.5 Common Functions

If CW has been used and the served user has an active subscription to CW, the CW function starts an operator-configurable alerting timer, and can play an operator-configurable announcement to the caller, to inform the caller that the called party has been informed that there is a waiting communication. The use of CW is recorded for charging and performance management purposes.

Upon receipt of a final response or expiry of the alerting timer, the CW announcement and the timer are stopped, if necessary, and the outcome of the CW use is recorded for performance management purposes.

The UA can use the Hold service to place an existing session on hold while the waiting communication is answered, refer to *MTAS Hold Communication Management Guide*.





## 2.6 Subfunctions

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

### 2.6.1 CWA and CWU Indication

This section describes the format of the Communication Waiting Active (CWA) and Communication Waiting Used (CWU) indication used in normal mode, Alternative mode 1, Mobile CW mode, and Mobile CW Alternative Mode 1. In Alternative mode 2, CW does not send the CWA indication or the CWU Alert-info header, nor does CW expect to receive the CWU Alert-info header.

The CWA and CWU definitions are taken from the [3GPP TS 24.615 v 8.2.0](#) standard.

#### CWA Indication

When the MTAS determines that a user with an active subscription to the CW service is in the ANDUB condition, the CW indication is added. The type of CW indication depends on value of `mtasCwIndication` attribute. It could be either “P-Service-IndicationSIP header”, “XML body” or both of them.

The following is an example of “P-Service-Indication” header:

```
P-Service-Indication = "CW"
```

The following is an example of an “XML body”:

```
<?xml version="1.0"?>
<ims-cw xmlns="urn:3gpp:ns:cw:1.0">
</ims-cw>
```

The schema for this is defined in [3GPP TS 24.615 v 8.2.0](#).

The XML body has a Content-Type of “application/vnd.3gpp.cw+xml” and a Content-Disposition header of “render”. The message handling parameter of the Content-Disposition header is set to “optional” so that terminals that do not support the CWA indication can ignore it.

The incoming `INVITE` to which this XML body is attached is likely to contain a Session Description Protocol (SDP) body already. If an SDP body exists, CW changes the message body to a multipart body and adds the CW XML body as the second part of the body, according to the rules in [3GPP TS 24.615 v 8.2.0](#).

If the body is already multipart, CW adds the CW XML body as the new last part.

An example `INVITE` as received by the terminating MTAS is as follows:



```
INVITE sip:userB@ims.com
Content-Type: application/sdp
Content-Length=192

<sdp body>
```

**Note:** Some headers have been omitted and the content lengths are only to illustrate that the length parameter has to be adjusted to take account of the extra body that is added.

The CW function signals availability of a waiting call by adding an XML body to the INVITE. The resulting INVITE looks like the following example:

```
INVITE sip:userB@ims.com
Content-Type: multipart/mixed; boundary="boundary1"
Content-Length=446

--boundary1
Content-Type: application/sdp

<sdp body>

--boundary1
Content-Type: application/vnd.3gpp.cw+xml
Content-Disposition: render; handling=optional

<?xml version="1.0">
<ims-cw xmlns="urn:3gpp:ns:cw:1.0">
  <communication-waiting-indication>
</ims-cw>
--boundary1--
```

The XML body is removed by the terminating UE and not sent back in subsequent responses.

**Note:** In the use cases in the rest of the document, the fact that an XML body has been added is shown in the abbreviated form CWA as INVITE B CWA.

### CWU Indication

The CWU indication can be included in a 180 Ringing response to an INVITE by the terminating UE to show that the user has been alerted to the waiting communication. The communication can be considered to be waiting if the initial INVITE contained CWA, ANDUB, or if the terminal considers that the communication is waiting (User CW). The CWU indication takes the form of an Alert-Info header field set to "<urn:alert:service:call-waiting>" according to [Alert-Info URNs for the Session Initiation Protocol \(SIP\)](#).

The following is an example of a 180 Ringing response containing the Alert-Info header:



```
SIP/2.0 180 Ringing
Alert-Info: <urn:alert:service:call-waiting>
```

If the MTAS receives a 180 Ringing with a CWU indication, it passes this on to the caller.

If the served user was determined to be ANDUB and the `INVITE` request included a CWA, then a CWU is added to any 180 Ringing sent which was received without this indication.

Observe that in the use cases in the rest of the document, the fact that an alert-info header field has been added to a 180 Ringing provisional response is indicated by the abbreviation CWU as follows:

```
180 Ringing CWU
```

## 2.6.2

### Announcements

This section describes the Terminate Announcement and Play Announcement subfunctions.

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

#### Terminate Announcement

The Terminate Announcement is a subfunction that terminates a currently playing announcement on request from the CW function. When the CW function requests termination of an announcement, the Terminate Announcement subfunction sends an H.248 Subtract message to the Media Resource Function Processor (MRFP).

When the Subtract Reply is received, indicating that the announcement has ceased, the Terminate Announcement subfunction informs the CW function.

#### Play Announcement

The Play Announcement subfunction is called by the CW function to play an announcement to the caller. It handles the communication with the MRFP to request it to play the appropriate announcement. The announcement normally plays to completion. If the announcement is still playing at the point where the waiting communication is canceled, times out, fails, is rejected, or accepted, then the CW function uses the Terminate Announcement subfunction to stop the announcement. While the announcement can contain repeating phrases such as “Please hold the line, the other person knows that you are waiting”, it is only played once by the MRFP. When the announcement has finished, the Play Announcement function informs the CW function.



## 2.7 CW Interaction with Other Services

The CW interaction with other MTAS services is described in this section.

### 2.7.1 Call Admission Control

This section describes the CW interactions with the CAC service.

For more information about the CAC service, refer to *MTAS Call Admission Control Management Guide*.

#### Normal Mode and Alternative Mode 1

The CW service depends on the User CAC (UCAC) service. That is, it is not possible to provision a user with the CW service unless that user also has the UCAC service provisioned with a waiting limit greater than zero.

The CW service is started for a terminating served user when the UCAC or Group CAC (GCAC) services determine that the served user is in the ANDUB state, or if a 180 Ringing response is received with a CWU indicator.

To classify the served user to be in ANDUB state when receiving a new call, when having reached the allowed limit of active sessions, requires that the attribute `total-active-limit` of UCAC and GCAC service data is provisioned with the ANDUB limit. If GCAC is used with allocation categories, the CM parameter `mtasConAllocLimit` must be configured with the ANDUB limit.

The UCAC service counts a session as a waiting session if the CW service adds a CWA indicator to an initial `INVITE`. CAC does not count CW sessions where user CW is used, that is, CWU is returned in the 180 Ringing but no CWA was sent, as waiting sessions. These sessions are counted by CAC as active sessions. This occurs because ANDUB has not been determined for the served user and all sessions where ANDUB was not determined are counted as active sessions.

#### Alternative Mode 2

There is no dependency between CAC and CW, when CW is in Alternative mode 2.

#### Mobile CW Mode

There is no dependency between CAC and CW, when CW is in Mobile CW mode.



### Mobile CW Alternative Mode 1

There is no dependency between CAC and CW, when CW is in Mobile CW Alternative Mode 1.

## 2.7.2 Charging

This section describes the CW interactions with the Charging service.

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

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

### Normal Mode and Alternative Mode 1

The MTAS records when CW is used. The use of CW is recorded for charging purposes on the first 180 Ringing received where the CW function determines that CW has been used, that is, ANDUB or containing a CWU indication only. Any subsequent CWU indications are ignored. The MTAS includes this information in the ACR/CCR generated for the session on which CW was used.

This is reported even for waiting communications that are not accepted by the served user.

For details of how the use of CW is recorded in the CCR, refer to [3GPP TS 24.615 v 8.2.0](#).

Charging events are raised each time CW is activated, deactivated, or interrogated using SSCs. Charging events are also raised when the CW subscriber activates or deactivates the CW service using the Ut interface. For details on the SSC services, refer to *MTAS Supplementary Service Codes Management Guide*.

### Alternative Mode 2

In Alternative mode 2, the use of CW is recorded in the ACR on the first 182 Queued.

## 2.7.3 Communication Diversion

There are several interactions between Communication Diversion (CDIV) services and CW.

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



### **Communication Forwarding Unconditional**

Communication Forwarding Unconditional (CFU) takes precedence over CW and will result in CW not being started.

### **Communication Forwarding Not Logged in**

Communication Forwarding Not Logged in (CFNL) takes precedence over CW and will result in CW not being started.

### **Communication Forwarding on Busy**

If the response to an `INVITE` containing a CWA is 486 (Busy here), 600 (Busy Everywhere), or 603 (Decline) then CW takes no action other than to pass the response backwards to the caller. If the served user also has Communication Forwarding on Busy (CFB) active and CDIV CM data has been set for the particular response code, this is started and the communication is diverted. The Busy response can be received after the 180 Ringing response where CW has been used.

### **Communication Forwarding No Reply**

If the subscriber with CW also has Communication Forwarding No Reply (CFNR) active, the action depends on the relative values of the CW Alerting timer (`mtasCwAlertTimer`) and the timer on CFNR. The timer on CFNR can either be set by the administration using the `mtasCDivTimer` CM object, or it can be set by the subscriber changing the value of the `cdiv-no-answer-timer` element in the XML data of the subscriber using Ut or SSCs.

If the subscriber has only one of these services (CW and CFNR), there is clearly no interaction.

If the value of the CW Alerting timer is less than the value of the CFNR timer and the subscriber does not respond to a waiting communication before the CW Alerting timer expires, the waiting communication is canceled and CFNR is not started.

If the value of the CW Alerting timer is greater than the CFNR timer and the subscriber does not respond to a waiting communication before the CFNR timer expires, the CFNR is started and the waiting communication canceled. If the subscriber has been provisioned with the ability to control the CFNR timer, they can control which of the CW and the CFNR is started first by changing the value of the CFNR timer.

### **Communication Forwarding Not Reachable**

The CW does not interact with the Communication Forwarding Not Reachable (CFNRc) service.



## Communication Deflection

If Communication Deflection (CD) is active at the nodal level, if a served user responds to a waiting communication with 302, the CW is stopped.

### 2.7.4 Communication Barring

If the CW subscriber has both Incoming Communication Barring (ICB) and CW active, ICB is started before CW being started. If the communication is barred, CW is not started.

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

### 2.7.5 Conference

The Conference Creator (CC) or the Conference Participants (CPs), or both, in a conference can also have CW active. The following case applies:

- The CC adds a participant to a conference and the participant has CW active and is busy.

#### — Normal mode and Alternative mode 1

When CW is in normal mode or Alternative mode 1, the terminating MTAS receives an `INVITE` from the conference focus for the served user. The CAC function determines that the new session puts the served user in the ANDUB state.

The CW function adds a CWA indication to the `INVITE`. The intended Conference Participant is alerted to the waiting communication. A 180 Ringing response which can contain a CWU indicator is returned. The conference focus sends a `NOTIFY` of the receipt of 180 Ringing to the CC. The `NOTIFY` does not contain the CWU indication. If the CW announcement is enabled, then the terminating MTAS attempts to play an announcement to the caller (the conference focus in this case). The SDP offer received from the focus is set to “sendrecv”. However, the termination allocated on the conference MRFP for this leg is set to “inactive” to prevent media such as ringing tones from the CP being mixed in to the conference before the participant is fully connected, that is, a `200 OK` has been received from the CP. Therefore, the CC and other CPs does not hear the announcement.

The net result is that the CC receives no indication that the intended participant is busy but does have CW.

#### — Alternative mode 2

When CW is in Alternative mode 2, the terminating MTAS receives an `INVITE` from the focus for the served user. If the terminating MTAS



receives a 182 Queued response, it converts it to a 180 Ringing. If the CW announcement is enabled, then the terminating MTAS attempts to play an announcement to the caller (the conference focus in this case), sending the announcement SDP answer in the 180 Ringing. The SDP offer received from the focus is set to "sendrecv". However, the termination allocated on the conference MRFP for this leg is set to "inactive" to prevent media such as ringing tones from the CP being mixed in to the conference before the participant is fully connected (that is, a 200 OK has been received from the CP). Therefore, the CC and other CPs does not hear the announcement.

The net result is that the CC or CP receives no indication that the intended participant is busy but does have CW.

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

## 2.7.6 CSCF Forking: Serial and Parallel Ringing

If the CW subscriber also has serial or parallel ringing, then an `INVITE` containing a CWA indication is forked by the terminating Call Session Control Function (CSCF) to all terminals that are currently registered. Depending on the busy/free state of each of the terminals, and whether they support the use of the CWA indicator, this results in multiple provisional responses being received by CW, some of which can contain a CWU indication.

The CW timer starts (`mtasCwAlertTimer`) when the first 180 Ringing response to an `INVITE` with CWA has been sent or when the first 180 Ringing containing a CWU indication is received and stops when the service terminates (the waiting communication is canceled, times out, fails, is rejected, or accepted) regardless of the number of 180 Ringing with or without CWU indications are received after the first one. Once CW has started, any subsequent 180 Ringing responses with or without CWU indications are passed transparently through to the caller except that if CW used was determined owing to the served user being in state ANDUB a CWU indicator is added to any 180 Ringing response received which does not contain the CWU indicator.

**Note:** This can result in mixed alerting at the terminal of the caller depending on how it handles multiple provisional responses.

## 2.7.7 Communication Completion

In normal mode and Alternative mode 1, CW is not offered as a result of a Communication Completion (CC) Call. In Alternative mode 2, CW treats a 182 Queued provisional response to a CC `INVITE` as a 180 Ringing provisional response, without a CWU indication.

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





### 2.7.8 Flexible Communication Distribution

When the Flexible Communication Distribution (FCD) target is a terminal of the served user, the CWA indicator is added to the INVITEs by the CW service without considering the terminal selector. Therefore, each terminal receives it, independent of the status of the terminal.

No CWA indicator is sent to the non-IMS primary user nor to the related users.

The CWU Alert-info header, received in the 180 Ringing from any of the FCD targets, is not passed on to the caller.

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

### 2.7.9 Timers

The CW has one timer attribute, `mtasCwAlertTimer`.

The following timers are not controlled by the CW service but run by the MTAS, which can affect the operation of the CW:

- `mtasCDivTimer`
- `mtasCDivNotReachableTimer`
- `mtasMmtNoReplyTimer`

If any of these timers expire before the `mtasCwAlertTimer` timer, the actions for the call depend upon the other services. The `mtasMmtNoReplyTimer` terminates the session while the CDIV timers result in diversion actions.

If preconditions were included in the SDP of the initial INVITE request, and the `mtasMmtPreconditionTimer` expires when attempting to negotiate preconditions to play the announcement, the announcement are not played.

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

## 2.8 Traffic View

CW performs the following steps:



**Note:** For Alternative mode 2, the served user does not get any indication of the subscription to CW in the `INVITE`. Instead the service is triggered by the served user responding with a 182 Queued instead of 180 Ringing.

For Mobile CW Alternative Mode 1, MTAS adds CW indication to all outgoing `INVITE`'s if the user is in active session. The `MtasCwUsed` PM counter is incremented. No further action is performed by CW function.

- Normal mode and Alternative mode 1

Service Invocation and Notification of Served User – an event triggers the execution of CW, that is, `INVITE` to served user reaches `ANDUB`. If the served user is in `ANDUB` state, the service is unlocked and the served user has an active subscription to CW. The CW notifies the served user by adding a CWA indication to the `INVITE` and CW then updates the appropriate PM counter and waits for the response to this indication.

- Mobile CW mode

Service Invocation and Notification of Served User – an event triggers the execution of CW, that is, `INVITE` to served user. If the service is unlocked and the served user has an active subscription to CW and there is no running CW timer, the `INVITE` is forwarded to the served user (without CWA).

- Normal mode and Alternative mode 1

Process Ringing Response – a response is received from the served user to the `INVITE` request. If CW has been used (that is, `ANDUB` was determined for served user at the `INVITE` request and CWA was added to the sent `INVITE` request OR the user specifically includes a notification that CW has been used, and the served user has an active subscription to CW), the CW function calls a subfunction to play an announcement to the calling party (if enabled), starts a timer, and enters the alerting phase. If the response is a rejection of CW, then CW updates the appropriate PM counters and terminates. If the response is a 180 Ringing provisional response with no indication where CWA was not sent, CW waits for a further response.

- Mobile CW mode

Process Ringing Response – a response is received from the served user to the `INVITE` request. If 180 Ringing response is received and this response includes CWU, the CW function calls a subfunction to play an announcement to the calling party (if enabled), starts a timer, and enters the alerting phase. If 180 Ringing response does not include CWU, it is forwarded to the caller and no further actions is performed by CW.

- Normal mode and Alternative mode 1 and 2



Handle CW final response – having determined that CW has been used, CW knows that the user is being alerted and waits for either a response from the served user, an event from the caller or a time-out. The served user can accept, ignore, or reject the communication. In each case CW stops the timer and announcement (if any) and increment the appropriate PM counter. If a `CANCEL` is received from the originating end (either as a result of the caller clearing down or CFNR operating), CW stops the timer and announcement (if playing) and increment the appropriate PM counter. If the timer fires, then CW cancels the waiting communication, stop the announcement (if any), and send 480 (Temporarily Unavailable) to the caller. It then updates the appropriate PM counter.

The traffic view of CW is shown in Figure 1. The service is triggered by the initial `INVITE` over IP Multimedia Service Control (ISC).

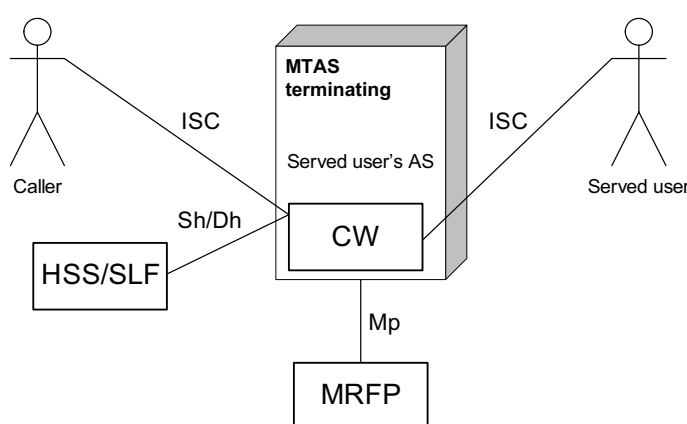


Figure 1 Main Traffic View of CW

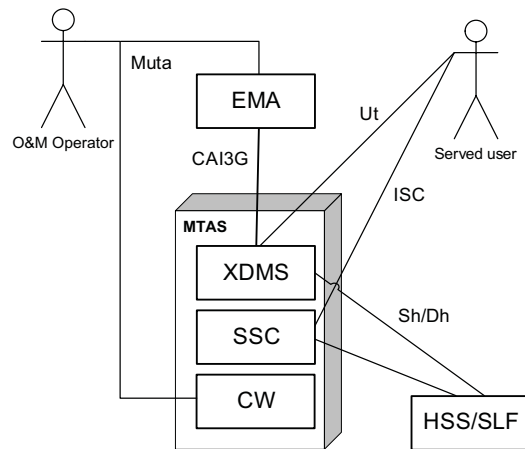
The CW subscription data is fetched from the Home Subscriber Server (HSS)/Subscriber Locator Function (SLF) through the Sh/Dh interfaces.

The served user receives an indication that there is an active subscription to CW in an `INVITE` received over ISC. The caller receives an indication that CW has been used at the end of the served user when a 180 Ringing response is received over the ISC interface when ANDUB was determined for the served user at the initial `INVITE` request and a CWA was added OR the 180 Ringing response contains a CWU indication. The CW function can play an announcement to the caller using the MRFP controlled over the Mp interface if playing of announcements is configured.

## 2.9 Configuration View

The node level configuration view of the CW is shown in Figure 2.

Node level configuration is performed by the operator who can customize the CW function. For example, by defining if an announcement is used as indication to the caller and by defining the announcement code, which specifies the identity and type of announcement to be played.



**Figure 2** Configuration View of CW

The subscriber subscription data is managed through the XDMS that provides the Ut interface (XCAP over HTTP) to the served user and CAI3G to the operator. XDMS uses Sh (Diameter) to update the HSS. The served user accesses the XDMS directly and the operator accesses it through the Business Support System. The served user can access the SSC Service through the SIP ISC interface to activate, deactivate, and interrogate the status of CW.



## 3 CW Configuration

The CW service of the MTAS is controlled by the *MtasCw* MO and its attributes. The MO structure of the CW service is shown in Figure 3.

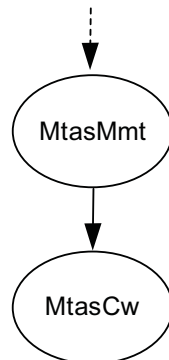


Figure 3 CW MO Structure

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

### 3.1 Operate Mode Setting

Alternative mode 1 or 2 is set when the CW is to control other features that are not included in the generic CW service.

The operate mode can only be changed if the `mtasCwAdministrativeState` is set to 0 (Locked) and the `mtasUCacAdministrativeState` is set to 0 (Locked).

The attribute `mtasCwOperateMode` can be set to the following values:

- 0 (Normal Mode)
- 1 (Alternative Mode 1)
- 2 (Alternative Mode 2)
- 4 (Mobile CW Mode)
- 5 (Mobile CW Alternative Mode 1)

### 3.2 Announcement Configuration

Announcement is played to a caller when the CW service is activated. Also, the CW can request a termination of a played announcement.



Announcement handling and CW announcement attributes are described in the following document: *MTAS Announcement Management Guide*.

### 3.3 Timer Setting

The timer in the CW service is controlled by the `mtasCwAlertTimer` attribute. Timers defined in other services can also affect the CW performance.

### 3.4 CW Administrative State Configuration

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

**Note:** If the `mtasCwOperateMode` attribute is set to 0 (Normal Mode) or 1 (Alternative Mode 1), the `mtasCwAdministrativeState` attribute must not be set to 1 (Unlocked), unless the `mtasUCacAdministrativeState` attribute is set to the value 1 (Unlocked).

### 3.5 Wholesale for CW Configuration

The CW service supports Wholesale. CW is configurable on Virtual Telephony Provider level.

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

- The `vtasCwAdministrativeState` attribute in the `VtasCw` MO.
- The `mtasCwAdministrativeState` attribute in the `MtasCw` MO.

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

### 3.6 CWA Indication Configuration

The type of CW indication is controlled by the `mtasCwIndication` attribute.

The `mtasCwIndication` attribute can be set to the followings values:

- |   |   |
|---|---|
| 0 | XML CW indication.                          |
| 1 | P-Service-Indication SIP header.            |
| 2 | P-Service-Indication and XML both are used. |



## 3.7 Service Data Management

This section describes how to configure the service data.

### 3.7.1 Operator Subscription Level Service Configuration

The operator can activate or deactivate the CW service subscription for the subscriber by setting the user data using the CAI3G protocol.

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

### 3.7.2 Subscriber Subscription Level Service Configuration

The subscriber data is configured through the Ut interface. The subscriber can set the value of the active attribute of the “communication-waiting-active” element to either `True` (Active) or `False` (Inactive).

If the `mtasCwOperateMode` attribute is set to 0 or 1, the “activated” attribute of “Communication Waiting” can only be set to `True` if the “activated” attribute of “user-call-admission-control” is set to `True`, and the value of “waiting-limit” element within “user-call-admission-control” is greater than 0. The XML schema for the Ut interface is defined in *MTAS Ut Structure*.

For an example of an XML document conforming to the schema, refer to *MTAS Examples of Provisioning Requests*.

## 3.8 Precondition Negotiation

The sending of 180 Ringing after precondition negotiation is controlled by the `mtasCwSend180RingingAfterPreconditionNegotiation` attribute.

The `mtasCwSend180RingingAfterPreconditionNegotiation` attribute can be set to the followings values:

- 0 DONT\_SEND\_180\_RINGING
- 1 SEND\_180\_RINGING

Default value: 1







## 4 Performance Management

For measurements related to the CW service, refer to *MTAS Performance Measurements*.





## 5 Fault Management

The CW service has no alarms.