



Technical Paper

Call Completion (CCBS/CCNR)
On OpenStage@Asterisk

Issue 1.1

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Germany

Summary

Call completion is a telephony feature which following a failure to complete a call. It allows the calling user to be notified when the called user is available to receive a call.

This document covers two conditions for call completion:

- CCBS (Call Completion Busy Subscriber)
- CCNR (Call Completion No Reply)

Call Completion features can be implemented on a PBX, a dedicated server (e.g. a voicemail Server) or directly on the client device (e.g. messaging applications).

There are several commercial companies which provide Call Completion features, as well as IETF documents specifying Call-Completion features for open standards, such as SIP.

The RFC 5359 gives a best practice example for call completion. The Unify OSCAR group has already evaluated the RFC with the result, that it is not useful for a B2BUA architecture.

The IETF BLISS working group currently provide a draft paper (<http://www.ietf.org/id/draft-ietf-bliss-call-completion-19.txt>) how call completion can be implemented. However there is still no RFC available, which covers this topic.

Although there is no standard released today, the OpenStage phones do support a server based call completion feature today.

An implementation according to the draft is planned, but currently not available.

This document provides best practise guidance, how call completion can be implement on any 3rd party SIP based server on the market together with the Unify OpenStage SIP phones.

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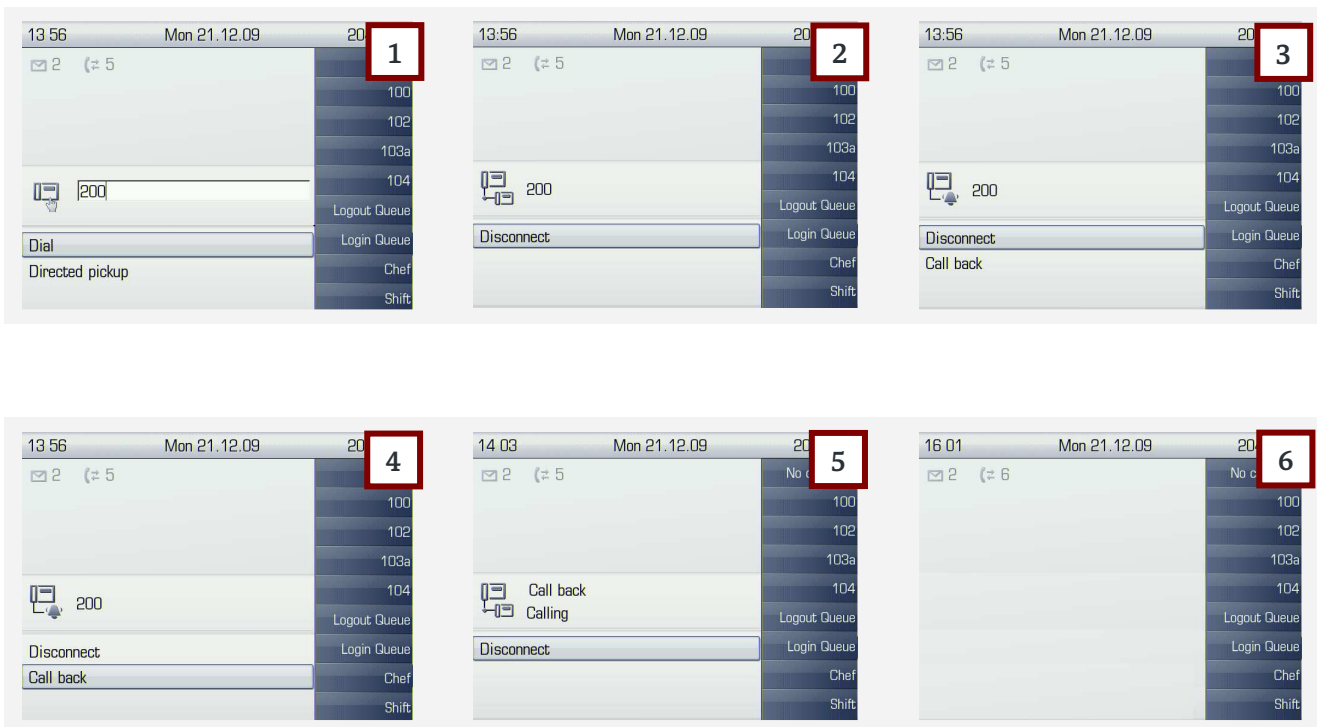
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1. Call Completion on OpenStage

1.1. CCBS/CCNR for the User

This is an overview about a possible implementation of a server based call completion implementation. The OpenStage phones do support these feature today without any additional change. The server must be configured appropriate and provide the additional features (see Call Server Requirements)

1.1.1. CCNR (Call Completion No Reply)

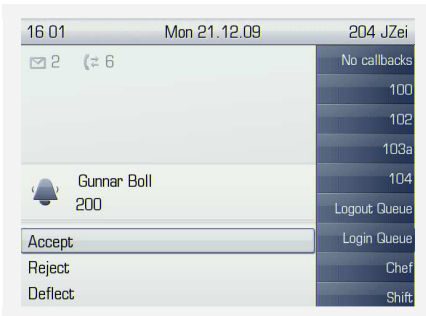


User scenario CCNR

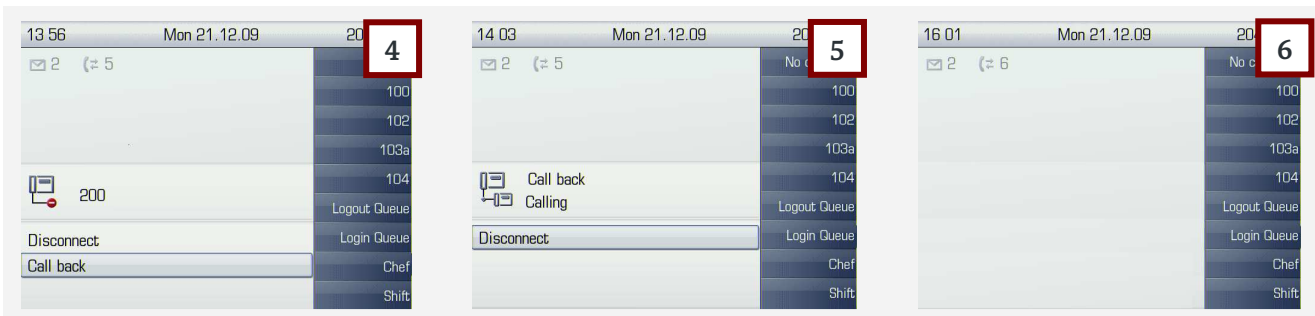
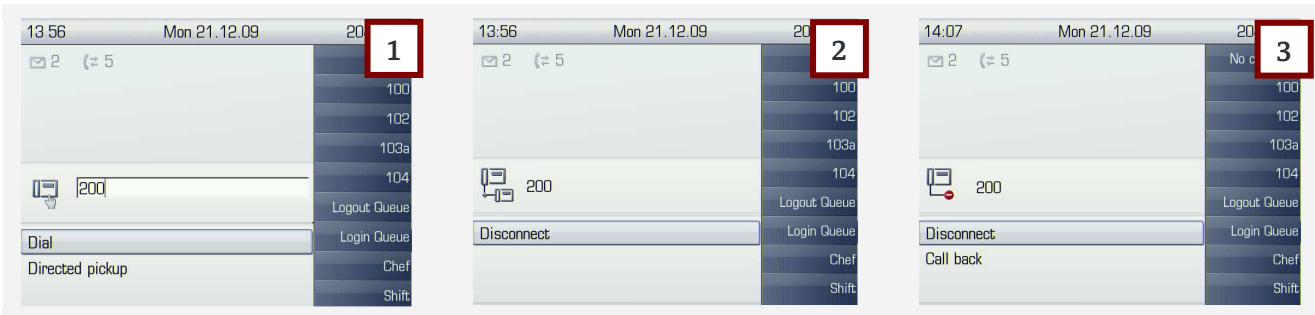
1. User invokes a call to user B (200)
2. Phone initiates the call
3. B party (200) is ringing. Call back option is displayed at user A.
4. B party does not pick up the call, user A invokes call back feature
5. Calls server plays announcement, informing user A that the call back feature was activated.
6. Phone returns to idle status

1.1.2. Server based Call Completion

The server will initiate a call to the user A if the called party will be available again:
 If user A accepts the call back, the call to user B is initiated automatically.



1.1.3. CCBS (Call Back Busy Subscriber)



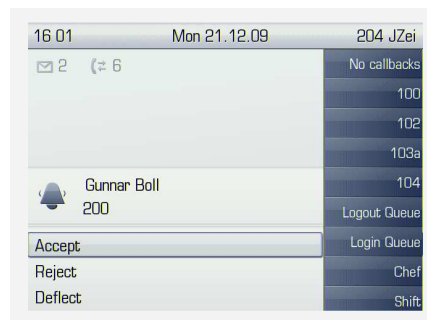
User Scenario CCBS

1. User A invokes a call to user B (200)
2. Phone A initiates the call
3. B party (200) is busy. Call back option is displayed at user A
4. User A invokes call back feature
5. Call server plays announcement, informing user A that the call back feature was activated
6. Phone A returns to idle status

1.1.4. Server based Call Completion

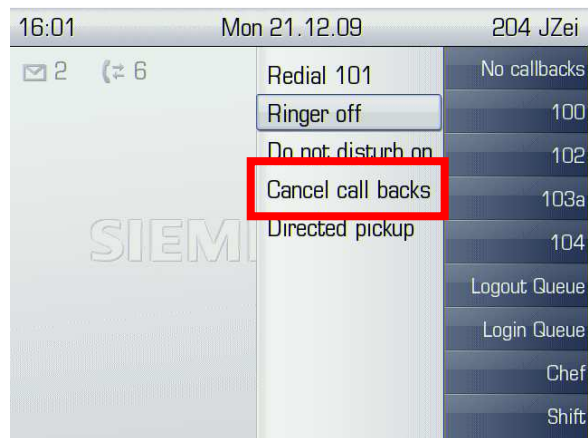
The server will initiate a call to the user if the called party will be available again:

If user A accepts the call back, the call to user B is initiated automatically.

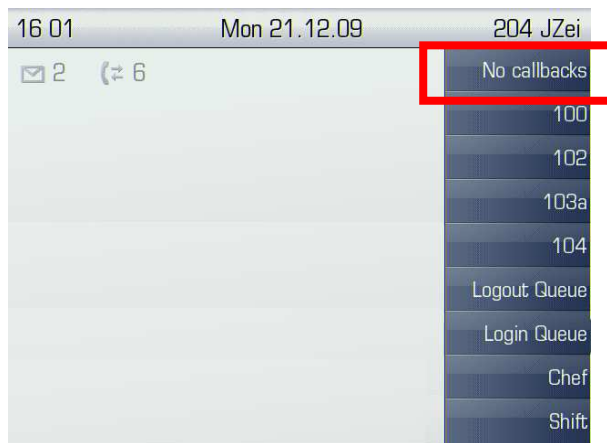


1.1.5. Delete all Callbacks

There are two possibilities to delete all callbacks: Context Menu in idle screen



Configure Free Programmable Key (FPK)



Remark: An additional comfort for the user can be implemented, if the server uses the OpenStage 'Server key' feature. The LED can be controlled additionally. A lit LED means, that there are callbacks available, which can be deleted. If the LED is off, no callbacks are available.

1.2. CCBS/CCNR for the Administrator

1.2.1. Phone Configuration

The Phone needs to be configured for sending callback feature codes. The configuration page can be found at:

Administrator Pages -> System -> Features -> Services

The relevant parameters are:

- a) **Code for Call Back Busy:** This specifies the feature code, which will be sent, when the called party is busy.
- b) **Code for callback no reply:** his specifies the feature code, which will be sent, when the called party is not answering. It can be the same code as in a).
- c) **Code for callback cancel all:** This specifies the feature code, which will be sent, when the user cancels all call backs

Services	
Message waiting server address	<input type="text"/>
Conference URI	<input type="text" value="conf@192.168.0.10"/>
Group pickup URI	<input type="text" value="*8*00004"/>
Code for callback busy	<input type="text" value="*1"/>
Code for callback no reply	<input type="text" value="*2"/>
Code for callback cancel all	<input type="text" value="*3"/>
BLF pickup code	<input type="text" value="*81*"/>

Administration page with call back parameters

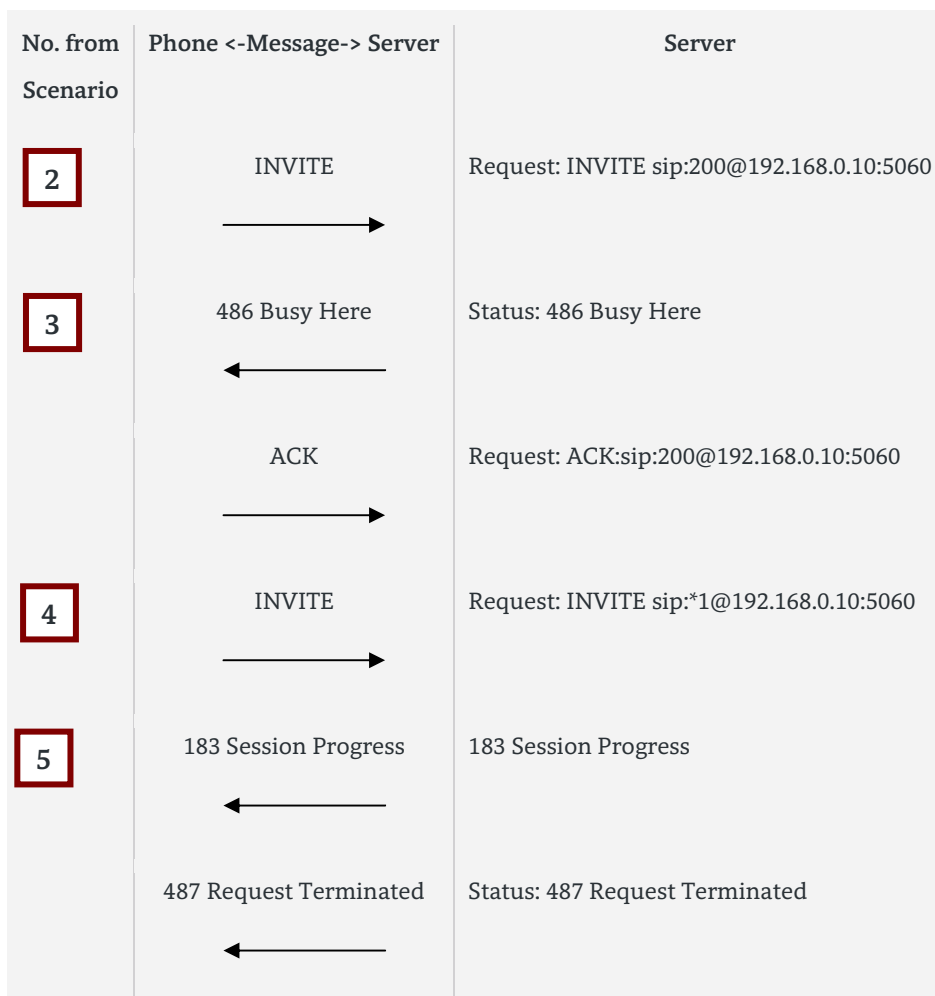
1.2.2. Message Flows

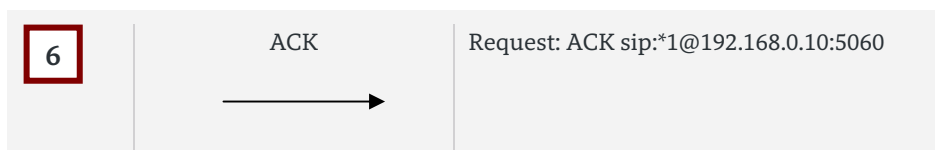
1.2.2.1. CCNR (Call Completion No Reply)

No. from Scenario	Phone <-Message-> Server	Message
2	INVITE →	Request: INVITE sip:200@192.168.0.10:5060
3	180 Ringing ←	Status: 180 Ringing
4	CANCEL →	Request: CANCEL sip:200@192.168.0.10:5060
	487 Request Terminated ←	Status: 487 Request Terminated
	ACK →	Request: ACK:sip:200@192.168.0.10:5060
	INVITE →	Request: INVITE sip:*2@192.168.0.10:5060
5	183 Session Progress ←	183 Session Progress
	487 Request Terminated ←	Status: 487 Request Terminated
6	ACK →	Request: ACK sip:*2@192.168.0.10:5060

1. User invokes a call to 200
2. Phone initiates the call
The phone starts a basic call to the server. (INVITE)
3. B party is ringing. Call back option is displayed
Phone receives the ringing code (180). Call back can be started at any time during the ringing phase
4. B party does not pick up the call, user invokes call back
The phone cancels the basic call (CANCEL/487/ACK) and sends the feature code to the server (INVITE). The INVITE has no information about the unsuccessful call which should be used for the call back. The server has to check his call history to find out which user must be monitored.
5. Calls server plays announcement, that the call back is initiated.
The server uses the early media mechanism (183) to play an announcement to the user. The user is informed whether his call back attempt was successful or not.
6. Phone returns to idle status.
The server terminates the call after the played announcement (487/ACK) and the phone is returning into the idle status again.

1.2.2.2. CCBS (Call Completion Busy Subscriber)



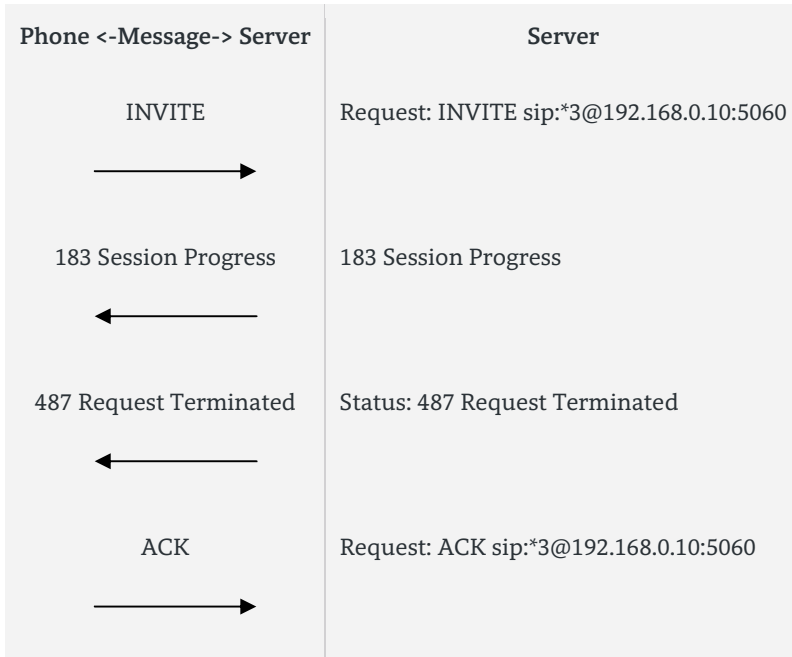


1. User invokes a call to 200
2. Phone initiates the call
The phone starts a basic call to the server. (INVITE)
3. B party (200) is busy. Call back option is displayed
4. Phone receives the busy code (486). Call back can be started at any time during the busy tone is played.
5. User invokes call back
The phone sends the feature code to the server (INVITE). The INVITE has no information about the call which should be used for the call back. The server has to check his call history to find out which user must be monitored.
6. Calls server plays announcement, that the call back is initiated.
The server uses the early media mechanism (183) to play an announcement to the user. The user is informed whether his call back attempt was successful or not.
7. Phone returns to idle status.
The server terminates the call after the played announcement (487/ACK) and the phone is returning into the idle status again.

1.2.3. Server based Call Completion

The server will initiate a call to the user when it is determined that the wanted party is available. The SIP server is responsible for establishing the session between the devices and may use SIP 3PCC procedures to establish the session

1.2.4. Delete all Callbacks



The phone sends the feature code to the server (INVITE). The feature code shows the server, that all call backs for this specific user must be cancelled. The server is able to play an announcement to the user, which informs the user about the success of the action

Remark:
The OpenStage phones do not make use of the reason phrase in the 487 response. A message included in the response will not be displayed on the OpenStage screen.

1.2.5. Beautifying the feature

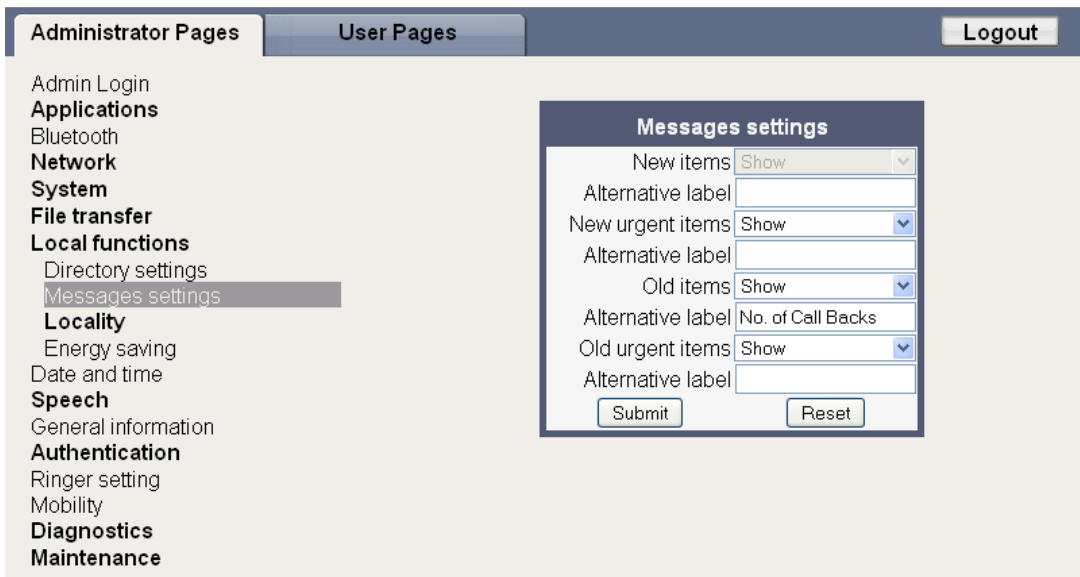
There are several possibilities to beautify the feature. Here are two suggestions for increasing the users convenience explained:

Delete all Callbacks with LED.

The administrator can use a server key for the 'delete all call backs' feature. The LED could be used to show whether call back requests are queued or not. For OpenStage 60/80 the 'voice dial' key could be used for example (SW version V2 R1 required)

Add information in the voicemail overview

The voice message system could be used to show detailed information about the outstanding call back requests to the user. If 'urgent messages' are not used the item can be renamed to display the number of outstanding call back requests. OpenStage SIP do support unsolicited NOTIFY requests for voicemail updates. The server can send such NOTIFY requests at any time.



2. Call Server Requirements

The current OpenStage CCBS/CCNR support is server based. The phone does not support a client based information management for call completion. Therefore the server must accomplish following tasks:

- Recognize feature codes for CCBS, CCNR and Delete call backs
- Play announcements about the status of the triggered features
- Monitor a users line to complete an open call back call via 3rd party call control
- Trigger the delete call back LED via dialog event package (optional)

About Unify

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