

Avaya DevConnect

AE Services General FAQ

Q: Can you explain the behavior of how CallIDs and UCIDs merge in conference and transfer scenarios?

A: There are two key pieces of information provided in TSAPI, JTAPI and DMCC messages that help applications track calls; those are the CallID and UCID. There are scenarios (conferences and transfers) where the CallID and UCID mapping changes. CTI applications can be notified of the UCID assigned to a call, and UCID services must be explicitly enabled on Communication Manager (there are DevConnect FAQs describing how, or you can consult the customer documentation for Communication Manager).

CTI applications should store both the CallID and UCID values for a call, when they first become aware of the call through some CTI event (e.g. DELIVERED or CALL_INITIATED). From the application's perspective these are the Original Call Information (OCI). The application may store other information from these messages as well as they may be useful in the operation of the CTI application.

When changes occur to the CallID or UCID they are reported to CTI applications in CONFERENCED and TRANSFERRED events. The application must track these changes in order to continue to 'follow' subsequent CTI events and properly make requests for the call. The application must utilize a number of data fields in the CONFERENCED and TRANSFERRED events to accomplish this tracking.

One group of data in CONFERENCED and TRANSFERRED messages (a structure) is titled "Original Call Information" (OCI) and there is a data field in this structure for a UCID data element. In the event that the UCID value is changing from the original (first reported) value, the TSAPI service (which drives the DMCC and JTAPI services) will populate the OCI UCID field. If there is no change occurring to the UCID value, this field is not populated; i.e. it contains null. Once populated, it remains populated. In general:

OCI fields are reported with a non-null value only if they are giving historical data from a prior call that is different than the current call.

The TSAPI Service shifts information into the OCI block as the call information changes.

In the CONFERENCED and TRANSFERRED events, the Secondary Old CallID field is populated with the call-id value for the resulting call post conference or transfer. The Primary Old CallID field is populated with the CallID value for the call that no longer exists after the conference or transfer completes (the unique parties in this call are moved to the Secondary Old Call). The Primary Old Call CallID information is the reference to the OCI information that is being brought forward into the resulting call (Secondary Old Call CallID) from the AE Services TSAPI perspective. If there are data fields populated in the OCI structure, they are replacements for the values that were associated with the Primary Old Call CallID before the conference or transfer operation was done.

There are two different mechanisms to complete a conference or transfer activity on a call. The first is a sequence of button pushes or mouse clicks at a physical (or software based) telephone. We typically refer to this operation as a 'manual' conference or transfer. The second mechanism to complete a conference or transfer is to request it through a CTI interface such as TSAPI, DMCC, JTAPI, CVLAN or

ASAI. All these APIs ultimately interface to Communication Manager using ASAI for the purpose of a CTI initiated conference or transfer operation. When initiated this way the conference or transfer is labeled as 'CTI' or '3PCC' (from the ASAI Third Party Call Control services).

For a `cstaConferenceCall`, the `originalCallInfo` includes the original call information originally received by the `heldCall` specified in the `cstaConferenceCall` request. For a manual call conference, the `originalCallInfo` includes the original call information originally received by the `primaryOldCall` specified in the event report.

When working with the CONFERENCED or TRANSFERRED events provided through TSAPI (and hence DMCC and JTAPI), one subtle fact to keep in mind is that the use of OCI data is specified as being associated with the held call (which is specified in the CTI request message) for ASAI 3PCC and with the Primary Old Call (as specified in the CONFERENCED or TRANSFERRED event) for a manual conference or transfer. The details describing this are found in the TSAPI programmers guide.

The TSAPI service will only populate OCI data if the associated data in the non-OCI portion of the message has changed. So the OCI data will be populated in the first message where its associated data in the non-OCI portion of the message is different than in previous messages. This means that some portions of OCI data will be populated and others may not be. Once the OCI data is populated it will not change unless there is a merge (conference or transfer operation) of two calls that have the same field of OCI data populated with different values. In the case of UCID and OCI UCID data, the first time that the OCI UCID will be populated is the first CONFERENCED or TRANSFERRED message. OCI UCID data will remain constant until a subsequent merge.

In a situation where two calls are conferenced or transferred, the CallID and OCI UCID going forward will be from one of the two calls, but **not necessarily both from the same call**. This is an important subtle point that often creates issues for application developers.

The Special Application "(SA8702) - CDR Enhancements for Network?" will influence the behavior of the CallID and UCID choice during merge operations, as will call state, the timing of transfer operation, the origination point of the transfer (manual – 3PCC), vector processing, and potentially other status information and enabled special applications.

A device/application will only get the historical view of UCIDs that are available to it through the monitors it establishes. It is possible that in the conference event a OCI UCID will be presented that the application is previously unaware of. See example 6. For the most complete UCID information to be available, the application needs to monitor all of the extensions involved in a call flow.

From ECMA-269 6th Edition / June 2004 – AE Services supports 'fixed view'

The contents of the `primaryOldCall` and the `secondaryOldCall` parameters may be either a "fixed view" or a "local view" of the connections at a device before the conference has been completed. The switching function indicates which view it provides via the `connectionView` parameter in the capability exchange services.

- fixed view - for each conferenced event generated by monitors placed on different devices in a call, the switching function provides the same information in the `primaryOldCall` and the

secondaryOldCall parameters independent of the monitorType (call or device-type monitor) and independent of the role of the device in the conference (conferencingDevice, addedParty, etc.).

The meaning of these parameters for the fixed-view are:

- o primaryOldCall - specifies the first call visible at the conferencingDevice.
- o secondaryOldCall - specifies the second call visible at the conferencingDevice.

The following examples were tested using all stations. In all but example 6, there was a monitor on the station doing the conferences. You may see different behaviors when trunks, vectors or other call flows are used, so be advised, that these scenarios are informative, not necessarily deterministic. Specifically these are examples; under different conditions the call may flow differently. Thus use the information in the CONFERENCED/TRANSFERRED event, not the scenario below to derive the resulting CallID and USID data.

Example 1: Simple Manual conference case

		CallID	UCID	OCI UCID	Primary Old Call CallID	Secondary Old Call CallID
1	Inbound call from customer(32001) to station A (32000)	739	86091	0		
2	A answers	739	86091	0		
3	Conference Hold at A	739	86091	0		
4	Originate new call at A, call B (32002)	740	86113	0		
5	B answers	740	86113	0		
6	A Conferences the two calls	740	86091	0	739	740

Here there is no OCI UCID populated because for the resulting CallID (740), it is using UCID information from CallID (739) which is specified as the Primary Old Call CallID, and the UCID for the resulting call has not changed from that which was used by the Primary Old Call.

Example 2: Simple 3PCC conference case

		CallID	UCID	OCI UCID	Primary Old Call CallID	Secondary Old Call CallID
1	Inbound call from customer(32001) to station A (32000)	111	35512	0		
2	A answers	111	35512	0		
3	Hold at A	111	35512	0		
4	Originate new call at A, call B (32002)	112	35581	0		
5	B answers	112	35581	0		
6	A Conferences the two calls	112	35512	0	111	112

Here there is no OCI UCID populated because for the resulting CallID (112), it is using UCID information from CallID (111) which is specified as the Primary Old Call CallID, and the UCID for the resulting call has not changed from that which was used by the Primary Old Call.

Example 3: Manually Conferencing two inbound calls

		CallID	UCID	OCI UCID	Primary Old Call CallID	Secondary Old Call CallID
1	Inbound call from customer(32001) to station A (32000)	741	87644	0		
2	A answers	741	87644	0		
3	Inbound call from customer(32002) to station A (32000)	743	87810	0		
4	A Holds 32001	741	87644	0		
5	A answers 32002	743	87810	0		
6	A initiates conference					
7	Conference holds CallID 743	743	87810			
8	System creates new call 744	744	87970			
9	A Selects (unholds) call 741	741	87644			
10	A conferences 741 and 743	741	87644	87810	743	741

Here there is a OCI UCID populated because for the resulting CallID (741) it is not using UCID information from the Primary Old Call CallID (743) which had a UCID value of 87810. The conference operation is changing the UCID value to become 87644 (the UCID value that was from CallID 741).

Example 4: 3PCC Conferencing two inbound calls

		CallID	UCID	OCI UCID	Primary Old Call CallID	Secondary Old Call CallID
1	Inbound call from customer(32001) to station A (32000)	113	35782	0		
2	A answers	113	35782	0		
3	Inbound call from customer(32002) to station A (32000)	114	35804	0		
4	A Holds 32001	113	35782	0		
5	A answers 32002	114	35804	0		
6	A 3PCC conferences 113 and 114	114	35782	0	113	114

Since 113 is the Primary Old Call CallID, the UCID associated with that CallID, 35782 is moving forward with the call, and isn't changing. Thus OCI UCID is not populated.

Example 5: Manually Conferencing two inbound conference calls

		CallID	UCID	OCI UCID	Primary Old Call CallID	Secondary Old Call CallID
1	A calls B	131	48831			
2	B answers	131	48831			
3	C calls B	132	48873			
4	B holds A	131				
5	B answers C	132	48873			
6	B conference Hold C	132				
7	B selects and unholds A	131	48831			
8	B completes Conference of AB and C hold and answers the incoming call from Agent C.	131	48831	48873	132	131
9	E calls D	134	49010			
10	D answers	134	49010			
11	F calls D	135	49045			
12	D holds E	134				
13	D answers F	135	49045			
14	D conference holds F	135				
15	D selects and unholds E	134				
16	D conferences D, E and F	134	49010	49045	135	134
17						
18	C Conference Holds AB	131				
19	C calls D	137	49219			
20	C completes the conference A, B, C, D	137	48831	48873	131	137
21	D holds E, F	134				
22	D answers ABCD	137	48831	48873		
23	D Conference holds ABCD	137				
24	D selects held EF	134				
25	D Conferences ABCDEF	134	48831	48873	137	134

In row 20, OCI UCID information is provided, because once populated, it remains populated. The OCI UCID data continues to point back to the call that was created on line 3. Once this field was populated in row 8, it remains populated for CallID 131 and subsequently 137. The UCID for call 132 is still the valid Original Call UCID. The UCID for CallID 137 (49219) is neither the current UCID, nor the OCI UCID and thus does not appear in the message/event.

In row 22 OCI UCID information is provided, because once this field is populated, it remains populated.

In row 25 when the two previously merged calls are merged together, the primary old CallID is 137, which had UCID 48831 and OCI UCID 48873, neither of which is changing. The resulting (secondary CallID) is 134.

Example 6: Manually Conferencing unmonitored device

In this example a call comes into an unmonitored device which then conferences in a monitored device. In these cases C is monitored, but B is doing the conferencing. Shaded rows represent events the application does **not** receive.

Example 6(a)

Only B is monitored

		CallID	UCID	OCI UCID	Primary Old Call CallID	Secondary Old Call CallID
1	A calls B	315	66286			
2	B answers	315				
3	B conference holds A	315				
4	B calls C	316	66351			
5	C answers	316				
6	B completes Conference of AB & C	316	66286	00000	315	316

This is an example of where the UCID is changed for CallID 316. The OCI data is not populated because the selected UCID is from the original call (315).

Example 6(b)

Only C is monitored; B conferences two inbound calls

		CallID	UCID	OCI UCID	Primary Old Call CallID	Secondary Old Call CallID
1	A calls B	317	66446			
2	B answers	317				
3	C calls B	318	66765			
4	B holds A	317				
5	B answers C	318				
6	B conference holds C	318				
7	B selects held A	317				
8	B completes conference.	317	66446	66765	318	317

In this scenario (conference of two inbound calls), the application is given a CallID (317), UCID (66446) pair, and both are unknown to the application. The OCI UCID is populated because the TSAPI middleware already informed the application of the call in row 3 and used the UCID of 66765. When the conference occurred in step 8, Communication Manager chose the UCID of 66446 for the resulting callID (317), and from the TSAPI middleware's perspective this represented a change to the UCID, which it then informs the application of by populating OCI UCID with 66765.

Example 6(c)

Only C is monitored

A calls B, and B answers. B conference-holds A and calls C, C answers and B forms the conference.

		CallID	UCID	OCI UCID	Primary Old Call CallID	Secondary Old Call CallID
1	A calls B	(536)	(09549)			
2	B answers	(536)				
3	B conference holds A	(536)				
4	B calls C	537	09552			
5	C answers	537				
6	B completes Conference of AB & C	537	09549	09552	536	537

TSAPI does not learn of the call until it arrives at monitored station C. Thus, from its perspective, the consultation call is the "original" call. When Communication Manager merges the two calls, it selects the UCID from the original call for the merged call. Because the UCID for the merged call is different from the UCID for what TSAPI thinks is the original call, TSAPI provides the UCID from the consultation call in OCI.

Example 7: Sequence of Manual Conferences

		CallID	UCID	OCI UCID	Primary Old Call CallID	Secondary Old Call CallID
1	A calls B	302	51200			
2	B answers	302				
3	B conference holds A	302				
4	B calls C	303	51249			
5	C answers	303				
6	B completes Conference of AB & C	303	51200	00000	302	303
7	B conference holds AC					
8	B calls D	307	51444			
9	D answers	307				
10	B completes conference of ABC & D	307	51200	00000	303	307
11	E calls B	308	51820			
12	B conference holds ACD	307				
13	B answers E	308	51820			
14	B conferences ABCDE	307	51200	51820	308	307
15	B conference holds ACDE	307				
16	B calls F	311	52667			
17	F answers	311				
18	B completes conference ABCDEF	311	51200	51820	307	311

On line 14, the event is conveying that all the call information associated with call 308 is still true with the exception of the UCID. it is becoming 51200 (and used to be 51820 when the CallID was 308).

On line 18, the event is conveying that all the call information associated with call 307 is still true. The OCI UCID is unchanged from row 14 indicating that the call information that was provided in line 11 is still in effect. The secondary CallID UCID is not reported in the event. It is assumed that the application has recorded this information at the point that at the point in time that row 16 occurred.