Grandstream Networks, Inc.

UCM6100 Series IP PBX Appliance

CDR and REC API Guide

Index

Table of Figures

CDR REPORT

CDR (Call Detail Record) is a data record produced by the PBX that contains attributes specific to a single instance of phone call handled by the PBX. It has several data fields to provide detailed description for the call, such as phone number of the calling party, phone number of the receiving party, start time, call duration, and etc.

CDR FILTER

On the UCM6100 series, the CDR can be accessed under web UI->**Status**->**CDR**->**CDR**. Users could filter the call report by specifying the date range and criteria, depending on how the users would like to include the logs to the report. Then click on "View Report" button to display the generated report.

Figure 1: CDR Filter

Table 1: CDR Filter Criteria

Inbound calls	Inbound calls are calls originated from a non-internal source (like a VoIP trunk) and sent to an internal extension.
Outbound calls	Outbound calls are calls sent to a non-internal source (like a VoIP trunk) from an internal extension.
Internal calls	Internal calls are calls from one internal extension to another extension, which are not sent over a trunk.
External calls	External calls are calls sent from one trunk to another trunk, which are not sent to any internal extension.
Caller Number	Enter the caller number to be filtered in the CDR report.

Caller Name	Enter the caller name to be filtered in the CDR report.
From Date	Specify "From" date and time to be filtered for the CDR report. Click on the field and the calendar will show for users to select the exact date and time.
To Date	Specify "To" date and time to be filtered for the CDR report. Click on the field and the calendar will show for users to select the exact date and time.

CDR REPORT DATA FIELDS

The CDR report has the following data fields:

- **Start Time**
  Format: *2013-03-27 16:47:03*

- **Call From**
  Example format:
  "John Doe"<6012>
  "WIRELESS CALLER"<123456789> [Trunk: CallCenterTrunk]

- **Call To**
  Example format:
  6005
  *97
  7080 [Trunk: CallCenterTrunk]

- **Answered By**
  Example format:
  6005
  trunk_16

- **Call Time**
  Format: *0:13:45*

- **Talk Time**
  Format: *0:13:41*

- **Status**
  No answer, Busy, Answered, or Failed.

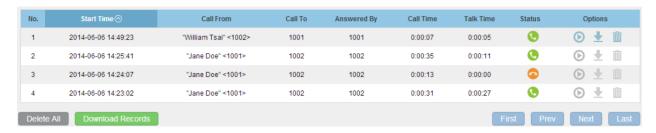The following figure shows CDR record produced by the UCM6100 series.

No.	Start Time ⌃	Call From	Call To	Answered By	Call Time	Talk Time	Status	Options
1	2014-06-06 14:49:23	"William Tsai" <1002>	1001	1001	0:00:07	0:00:05	📞	▶ ⬇ 🗑
2	2014-06-06 14:25:41	"Jane Doe" <1001>	1002	1002	0:00:35	0:00:11	📞	▶ ⬇ 🗑
3	2014-06-06 14:24:07	"Jane Doe" <1001>	1002	1002	0:00:13	0:00:00	📞	▶ ⬇ 🗑
4	2014-06-06 14:23:02	"Jane Doe" <1001>	1002	1002	0:00:31	0:00:27	📞	▶ ⬇ 🗑

Delete All   Download Records   First   Prev   Next   Last

Figure 2: CDR Report

CDR REPORT OPERATIONS

Users could perform the following operations on the above CDR report.

- **Sort**
  Click on the header of the column to sort by this category. For example, clicking on "Start Time" will sort the report according to start time. Clicking on "Start Time" again will reverse the order.

- **Download Records**
  On the bottom of the page, click on "Download Records" button to export the report in .csv format.

- **Automatic Download Settings**

  Click on Automatic Download Settings and enable automatic CDR recording download. The downloaded CDR recordings will be sent to the Email address configured in "Automatic Download Settings" dialog based on the selected automatic download period.

- **Delete All**
  On the bottom of the page, click on "Delete All" button to remove all the call report information.

- **Options**
  There are three buttons for each CDR entry. If the call is recorded, the three buttons will be available (shown in blue) for users to click on.

  ⬇ : Download the voice recording for the call

  ▶ : Play the voice recording for the call

  🗑 : Delete the voice recording for the call

CDR CSV FILE

The downloaded CDR .csv file has different format from the web UI CDR. Here are some descriptions.

- **Call From, Call To**

"Call From": the caller ID.
"Call To": the callee ID.

If "Call From" shows empty, "Call To" shows "s" (see highlight part in the picture below) and the "Source Channel" contains "DAHDI", this means the call is from FXO/PSTN line. For FXO/PSTN line, we only know there is an incoming request when there is incoming call but we don't know the number being called. So we are using "s" to match it where "s" means "start".

call from	call to	context	start time	answer time	end time	call time	talk time	source channel	dest channel	status
610	19097622990	from-internal	1/29/2014 14:28	1/29/2014 14:28	1/29/2014 14:31	153	150	SIP/610-00000074	DAHDI/1-1	ANSWERED
	s	default	1/29/2014 14:33		1/29/2014 14:33	8	0	DAHDI/pseudo-149089967		NO ANSWER
	s	default	1/29/2014 14:33		1/29/2014 14:33	9	0	DAHDI/pseudo-1067045536		NO ANSWER
601	688	from-internal	1/29/2014 14:33	1/29/2014 14:33	1/29/2014 14:33	9	9	SIP/601-00000077		ANSWERED
	s	default	1/29/2014 14:34		1/29/2014 14:34	22	0	DAHDI/pseudo-1124093033		NO ANSWER
	s	default	1/29/2014 14:34		1/29/2014 14:34	22	0	DAHDI/pseudo-1719498666		NO ANSWER

Figure 3: Downloaded CDR File Sample – Call To Shows "s"

- **Context**

There are different context values that might show up in the downloaded CDR file. The actual value can vary case by case. Here are some sample values and their descriptions.

from-internal: internal extension makes outbound calls.
ext-did-XXXXX: inbound calls. It starts with "ext-did", and "XXXXX" content varies case by case, which also relate to the order when the trunk is created.
ext-local: internal calls between local extensions.

- **Source Channel, Dest Channel**

Sample 1:

call from	call to	context	start time	answer time	end time	call time	talk time	source channel	dest channel	status
3122731439	s	ext-did-1	1/30/2014 14:27	1/30/2014 14:27	1/30/2014 14:27	37	35	DAHDI/1-1		ANSWERED

Figure 4: Downloaded CDR File Sample - Source Channel and Dest Channel 1

DAHDI means it is an analog call, FXO or FXS.

For UCM6102, DAHDI/(1-2) are FXO ports, and DAHDI(3-4) are FXS ports.

For UCM6104, DAHDI/(1-4) are FXO ports, and DAHDI(5-6) are FXS ports.

For UCM6108, DAHDI/(1-8) are FXO ports, and DAHDI(9-10) are FXS ports.

For UCM6116, DAHDI/(1-16) are FXO ports, and DAHDI/(17-18) are FXS ports.

Sample 2:

call from	call to	context	start time	answer time	end time	call time	talk time	source channel	dest channel	status
609	619	from-internal	1/30/2014 14:31	1/30/2014 14:32	1/30/2014 14:32	9	3	SIP/609-00000150	SIP/619-00000151	ANSWERED

Figure 5: Downloaded CDR File Sample - Source Channel and Dest Channel 2

"SIP" means it's a SIP call. There are three possible format:

(a) **SIP/NUM-XXXXXX,** where NUM is the local SIP extension number. The last XXXXX is a random string and can be ignored.

(c) **SIP/trunk_X/NUM,** where trunk_X is the internal trunk name, and NUM is the number to dial out through the trunk.

(c) **SIP/trunk_X-XXXXXX,** where trunk_X is the internal trunk name and it is an inbound call from this trunk. The last XXXXX is a random string and can be ignored.

Sample 3:

call from	call to	context	start time	answer time	end time	call time	talk time	source channel	dest channel	status
	s	default	1/30/2014 14:30		1/30/2014 14:37	386	0	DAHDI/pseudo-1665832080		NO ANSWER
	s	default	1/30/2014 14:30		1/30/2014 14:37	390	0	DAHDI/pseudo-1946772436		NO ANSWER

Figure 6: Downloaded CDR File Sample - Source Channel and Dest Channel 3

This is a very special channel name. If it shows up, most likely it means a conference call.

There are some other possible values, but these values are almost the application name which are used by the dialplan.

IAX2/NUM-XXXXXXX: it means this is an IAX call.

Local/@from-internal-XXXXX: it is used internally to do some special feature procedure. We can simply ignore it.

Hangup: the call is hung up from the dialplan. This indicates there are some errors or it has run into abnormal cases.

Playback: play some prompts to you, such as 183 response or run into an IVR.

ReadExten: collect numbers from user. It may occur when you input PIN codes or run into DISA

API CONFIGURATION

The UCM6100 supports third party billing interface API for external billing software to access CDR and call recording files on the PBX. The API uses HTTPS to request the CDR data and call recording data matching given parameters as configured on the third party application.

API CONFIGURATION

Before accessing the CDR API (to access call detail records) and REC API (to access call recording files), the administrators need enable API and configure the access/authentication information on the UCM6100 first.

Table 2: API Configuration Parameters

Enable	Enable/Disable API. The default setting is disabled.
TLS Bind Address	Configure the IP address for TLS server to bind to. "0.0.0.0" means binding to all interfaces. The port number is optional and the default port number is 8443. The IP address must match the common name (host name) in the certificate so that the TLS socket won't bind to multiple IP addresses. The default setting is 0.0.0.0:8443.
TLS Private Key	Upload TLS private key. The size of the key file must be under 2MB. This file will be renamed as 'private.pem' automatically.
TLS Cert	Upload TLS cert. The size of the certificate must be under 2MB. This is the certificate file (*.pem format only) for TLS connection. This file will be renamed as "certificate.pem" automatically. It contains private key for the client and signed certificate for the server.
TLS Authentication Name	Configure the user name for TLS authentication. If not configured, authentication will be skipped.
TLS Authentication Password	Configure the password for TLS authentication. This is optional.
Permitted IP(s)	Specify a list of IP addresses permitted by CDR and REC API. This creates an API-specific access control list. Multiple entries are allowed. For example, "192.168.40.3/255.255.255.255" denies access from all IP addresses except 192.168.40.3. The default setting is blank, meaning all IP addresses will be denied.

CDR API – ACCESS CALL DETAIL RECORDS

CDR API URL FORMAT

The format of the HTTPS request for the CDR API is as below. This is used to request the CDR data matching given parameters as set by the third party application.

https://[UCM IP]:[Port]/cdrapi?[option1]=[value]&[option2]=[value]&...

By default, the port number for the API is 8443.

CDR API URL PARAMETERS

The options included in the above request URI control the record matching and output format. For CDR matching parameters, all non-empty parameters must have a match to return a record. Parameters can appear in the URI in any order. Multiple values given for caller or callee will be concatenated.

The following table shows the parameter list used in the CDR API.

Table 3: CDR API URL Parameters

Field	Value	Details
format	csv, xml, json	Determines the format for output of matching CDR rows. Default is csv (comma separated values).
numRecords	Number: 0-1000	Number of records to return. Default is 1000, which is also the maximum allowed value.
offset	Number	Number of matching records to skip. This will be combined with numRecords to receive all matches over multiple responses. Default is 0.

caller	Comma separated extensions, ranges of extensions, or regular expressions.	Filters based on src (caller) or dst (callee) value, matching any extension contained in the parameter input string.
callee	Example: caller=5300,5302-5304,_4@ -OR-	Patterns containing one or more wildcards ('@' or '_') will match as a regular expression, and treat '-' as a literal hyphen rather than a range signifier. The '@' wildcard matches any number of characters (including zero), while '_' matches any single character.
answeredby	caller=5300&caller=5302-5304&caller=_4@ (Matches extensions 5300, 5302, 5303, 5304, and any extension containing 4 as the second digit/character).	Otherwise, patterns containing a single hyphen will be matching a range of numerical extensions, with non-numerical characters ignored, while patterns containing multiple hyphens will be ignored. (The pattern "0-0" will match all non-numerical and empty strings).
startTime	Date and/or time of day in any of the following formats: YYYY-MM-DDTHH:MM YYYY-MM-DDTHH:MM:SS YYYY-MM-DDTHH:MM:SS.SSS (literal 'T' character separator in above three formats) HH:MM	Filters based on the start (call start time) value. Calls which start within this period (inclusive of boundaries) will match, regardless of the call answer or end time. An empty value for either field will be interpreted as range with no minimum or maximum respectively. Strings without a date have a default value of 2000-01-01. Strings without a time of day have a default value of of 00:00 UTC, while strings with a time of day specified may also optionally specify a time zone offset - replace '+' in time zone offset with '%2B' (see http://www.w3.org/TR/NOTE-datetime).
endTime	HH:MM:SS HH:MM:SS.SSS now DDDDDDDDDD	
minDur	Number (duration in seconds)	Filters based on the billsec value, the duration between call answer and call end.
maxDur		

EXAMPLE QUERIES

The following illustrates the format of queries to accomplish certain requests. In most cases, multiple

different queries will accomplish the same goal, and these examples are not intended to be exhaustive, but rather to bring attention to particular features of the CDR API connector.

Query 1: Request all records of calls placed on extension 5300 which last between 8 and 60 seconds (inclusive), with results in CSV format.

https://192.168.254.200:8088/cdrapi?format=CSV&caller=5300&minDur=8&maxDur=60

-OR-

https://192.168.254.200:8088/cdrapi?caller=5300&minDur=8&maxDur=60

Query 2: Request all records of calls placed on extension 5300 or in the range 6300-6399 to extensions starting with 5, with results in XML format.

https://192.168.254.200:8088/cdrapi?format=XML&caller=5300,6300-6399&callee=5@

-OR-

https://192.168.254.200:8088/cdrapi?cdrapi?format=XML&caller=5300&caller=6300-6399&callee=5@

Query 3: Request all records of calls placed on extensions containing substring "53" prior to January 23, 2013 00:00:00 UTC to extensions 5300-5309, with results in CSV format.

https://192.168.254.200:8088/cdrapi?caller=@53@&callee=5300-5309&endTime=2013-01-23

-OR-

https://192.168.254.200:8088/cdrapi?caller=@53@&callee=530_&endTime=2013-01-23T00:00:00

Query 4: Request all records of calls placed by an Anonymous caller during July 2013 Central Standard Time to extensions starting with 2 or 34 or ending with 5, with results in CSV format.

https://192.168.254.200:8088/cdrapi?caller=Anonymous&callee=2@,34@,@5&startTime=2013-07-01T00:00:00-06:00&endTime=2013-07-31T23:59:59-06:00

Query 5: Request all records during July 2013 Central Standard Time, 200 at a time, with results in CSV format.

https://192.168.254.200:8088/cdrapi?startTime=2013-07-01T00:00:00-06:00&endTime=2013-07-31T23:59:59-06:00&numRecords=200&offset=0

      -THEN-

https://192.168.254.200:8088/cdrapi?sstartTime=2013-07-01T00:00:00-06:00&endTime=2013-07-31T23:59:59-06:00&numRecords=200&offset=200

      -THEN-

https://192.168.254.200:8088/cdrapi?startTime=2013-07-01T00:00:00-06:00&endTime=2013-07-31T23:59:59-06:00&numRecords=200&offset=400

⚠ **Note:**

- Disallowed characters in the caller, callee, startTime, or endTime strings, and non-digit characters in the values of numRecords, offset, minDur, or maxDur, will result in no records returned - the appropriate container/header for the output format will be the only output. If the format parameter is in error, the CSV header will be used. Error messages will appear in the Asterisk log (along with errors stemming from failed database connections, etc.).

- Other errors which return no records include:

  - Multiple hyphens in an extension range (e.g. caller=5300-5301-,6300)

  - Empty parameter value (e.g. caller=)

  - Extension values starting with comma, or with consecutive commas (e.g. caller=5300,,5303)

  - Unknown parameters (e.g. caler=5300) or URI ending with '&'

  - Except for caller and callee, multiple instances of the same parameter within the URI (e.g. minDur=5&minDur=10)

EXAMPLE OUTPUT

The following are examples of each of the output formats for the same data set.

CSV

```
AcctId,accountcode,src,dst,dcontext,clid,channel,dstchannel,lastapp,lastdata,start,answer,end,duration
,billsec,disposition,amaflags,uniqueid,userfield,channel_ext,dstchannel_ext,service
62,,5300,5301,from-internal,"pn01" <5300>,SIP/5300-00000000,SIP/5301-
00000001,Dial,SIP/5301,60,,2013-12-03 11:46:40,2013-12-03 11:46:43,2013-12-03
11:46:49,9,6,ANSWERED,DOCUMENTATION,1386092800.0,EXT,5300,5301,s
63,,5300,5301,from-internal,"pn01" <5300>,SIP/5300-00000000,SIP/5301-
00000001,Dial,SIP/5301,60,,2013-12-03 14:01:41,2013-12-03 14:01:43,2013-12-03
14:01:46,5,3,ANSWERED,DOCUMENTATION,1386100901.0,EXT,5300,5301,s
64,,5300,5301,from-internal,"pn01" <5300>,SIP/5300-00000002,SIP/5301-
00000003,Dial,SIP/5301,60,,2013-12-03 14:02:23,2013-12-03 14:02:27,2013-12-03
14:02:31,8,4,ANSWERED,DOCUMENTATION,1386100943.2,EXT,5300,5301,s
```

XML

```
<root>
<cdr><AcctId>62</AcctId><accountcode></accountcode><src>5300</src><dst>5301</dst><dcontext
>from-internal</dcontext><clid>&quot;pn01&quot; &lt;5300&gt;</clid><channel>SIP/5300-
00000000</channel><dstchannel>SIP/5301-
00000001</dstchannel><lastapp>Dial</lastapp><lastdata>SIP/5301,60,</lastdata><start>2013-12-03
11:46:40</start><answer>2013-12-03 11:46:43</answer><end>2013-12-03
11:46:49</end><duration>9</duration><billsec>6</billsec><disposition>ANSWERED</disposition><a
maflags>DOCUMENTATION</amaflags><uniqueid>1386092800.0</uniqueid><userfield>EXT</userfi
eld><channel_ext>5300</channel_ext><dstchannel_ext>5301</dstchannel_ext><service>s</service>
</cdr>
<cdr><AcctId>63</AcctId><accountcode></accountcode><src>5300</src><dst>5301</dst><dcontext
>from-internal</dcontext><clid>&quot;pn01&quot; &lt;5300&gt;</clid><channel>SIP/5300-
00000000</channel><dstchannel>SIP/5301-
00000001</dstchannel><lastapp>Dial</lastapp><lastdata>SIP/5301,60,</lastdata><start>2013-12-03
14:01:41</start><answer>2013-12-03 14:01:43</answer><end>2013-12-03
14:01:46</end><duration>5</duration><billsec>3</billsec><disposition>ANSWERED</disposition><a
maflags>DOCUMENTATION</amaflags><uniqueid>1386100901.0</uniqueid><userfield>EXT</userfi
eld><channel_ext>5300</channel_ext><dstchannel_ext>5301</dstchannel_ext><service>s</service>
</cdr>
<cdr><AcctId>64</AcctId><accountcode></accountcode><src>5300</src><dst>5301</dst><dcontext
>from-internal</dcontext><clid>&quot;pn01&quot; &lt;5300&gt;</clid><channel>SIP/5300-
00000002</channel><dstchannel>SIP/5301-
00000003</dstchannel><lastapp>Dial</lastapp><lastdata>SIP/5301,60,</lastdata><start>2013-12-03
14:02:23</start><answer>2013-12-03 14:02:27</answer><end>2013-12-03
14:02:31</end><duration>8</duration><billsec>4</billsec><disposition>ANSWERED</disposition><a
maflags>DOCUMENTATION</amaflags><uniqueid>1386100943.2</uniqueid><userfield>EXT</userfi
eld><channel_ext>5300</channel_ext><dstchannel_ext>5301</dstchannel_ext><service>s</service>
</cdr>
</root>
```

JSON

```
{
   "cdr":
   [
      { "AcctId": "62", "accountcode": "", "src": "5300", "dst": "5301", "dcontext": "from-internal", "clid":
"\"pn01\" <5300>", "channel": "SIP/5300-00000000", "dstchannel": "SIP/5301-00000001", "lastapp":
"Dial", "lastdata": "SIP/5301,60,", "start": "2013-12-03 11:46:40", "answer": "2013-12-03 11:46:43",
"end": "2013-12-03 11:46:49", "duration": "9", "billsec": "6", "disposition": "ANSWERED", "amaflags":
"DOCUMENTATION", "uniqueid": "1386092800.0", "userfield": "EXT", "channel_ext": "5300",
"dstchannel_ext": "5301", "service": "s" },
      { "AcctId": "63", "accountcode": "", "src": "5300", "dst": "5301", "dcontext": "from-internal", "clid":
"\"pn01\" <5300>", "channel": "SIP/5300-00000000", "dstchannel": "SIP/5301-00000001", "lastapp":
"Dial", "lastdata": "SIP/5301,60,", "start": "2013-12-03 14:01:41", "answer": "2013-12-03 14:01:43",
"end": "2013-12-03 14:01:46", "duration": "5", "billsec": "3", "disposition": "ANSWERED", "amaflags":
"DOCUMENTATION", "uniqueid": "1386100901.0", "userfield": "EXT", "channel_ext": "5300",
"dstchannel_ext": "5301", "service": "s" },
      { "AcctId": "64", "accountcode": "", "src": "5300", "dst": "5301", "dcontext": "from-internal", "clid":
"\"pn01\" <5300>", "channel": "SIP/5300-00000002", "dstchannel": "SIP/5301-00000003", "lastapp":
"Dial", "lastdata": "SIP/5301,60,", "start": "2013-12-03 14:02:23", "answer": "2013-12-03 14:02:27",
"end": "2013-12-03 14:02:31", "duration": "8", "billsec": "4", "disposition": "ANSWERED", "amaflags":
"DOCUMENTATION", "uniqueid": "1386100943.2", "userfield": "EXT", "channel_ext": "5300",
"dstchannel_ext": "5301", "service": "s" }
   ]
}
```

REC API – ACCESS CALL RECORDING FILES

REC API URL FORMAT

The format of the HTTPS request for the REC API is as below. This is used to request call recordings, or a list of recording files within the Asterisk spool directories, matching given parameters as set by the third party application.

https://[UCM IP]:[Port]/recapi?[option1]=[value]&[option2]=[value]&...

By default, the port number for the API is 8443.

REC API URL PARAMETERS

REC API takes two parameters: filedir and filename. Both parameters are optional, and the response depends on which parameters are included in the request.

Case 1: Neither parameter is set.

Example Request:

https://192.168.254.200:8443/recapi

Response:

A CSV file listing all directories under ast_config_AST_SPOOL_DIR.

Case 2: Only filedir is set.

In this case, multiple file directories are supported, separated by '@'.

Example Request:

https://192.168.254.200:8443/recapi?filedir=monitor@meetme@voicemail/default

Response:

A CSV file listing the contents of each directory listed (relative to ast_config_AST_SPOOL_DIR).

Case 3: Both filedir and filename are set.

In this case, multiple file names are supported, separated by '@'; multiple file directories are not currently supported.

Example Request:

https://192.168.254.200:8443/recapi?filedir=meetme&filename=meetme-conf-rec-6300-1411501234.0-

0.wav@meetme-conf-rec-6301-1411505678.9-0.wav

Response:

The matching WAV file (if only one valid file found, in WAV format).

                  -OR-

A tarball containing all matching files, named [timestamp].tar, where the timestamp is set at the start of the API callback function.

                  -OR-

404: Not Found (if no matching files are found).

Case 4: Only filename is set.

This case is the same as **Case 3**, with the file directory defaulting to "monitor".

Example Request:

https://192.168.254.200:8443/recapi?filename=auto-1414771234-1000-1004.wav@auto-1414775678-1001-

1003.wav

Response:

See **Case 3**.

This document can be downloaded here:
http://www.grandstream.com/products/ucm_series/ucm61xx/documents/ucm61xx_cdr_rec_api_guide.pdf

Asterisk is a Registered Trademark of Digium, Inc.