VegaStream Information Note
Billing CDRs

Introduction.

This information note identifies the capabilities of the Vega product range with respect to providing billing CDRs (Call Detail Records) via the telnet or serial interfaces.

For details about Billing CDRs available via Radius Accounting, see information note IN_07-Radius_Accounting.

Frequently billing is carried out by the SIP proxy or the H.323 gatekeeper rather than by the Vega end-point itself. The benefit of this is that the billing records are collected at a single point rather than from multiple distributed end points. When using the proxy / gatekeeper for billing, the Answer and Disconnect messages sent to the proxy / gatekeeper define the duration of the call. (See Table 1 for details of when the Vega sends Answer and Disconnect)

Where billing CDR records are required from the Vega, the following should be noted:

Vega CDRs

1. Vega products have an internal buffer for holding CDRs, but this is limited as the Vega has no internal disc backup. This internal buffer is designed to hold CDRs only for short periods of time whilst, for example, an external application changes the file to which it is writing the CDRs.

2. The internal buffer can be configured to buffer from 10 to 300 CDR entries (default = 100 entries).

3. Billing CDRs can be collected over the serial interface or the telnet interface.

4. To command the Vega to supply the billing CDRs in real time, use:
   ```
   Bill display on
   ```
   Please see Table 2 for the format of the information provided.

5. To adjust the filtering of the billing CDRs, one of these two commands can be used:

```
Bill on
Bill Z
```

`Bill on` commands the Vega to supply only billing CDRs with finite call duration (non zero Answer to disconnect time – good calls).
`Bill Z` commands the Vega to supply billing CDRs with both zero and finite call duration. This means that as well as calls which were answered, calls to busy destinations and calls that failed for other reasons will also be logged.

6. Vega billing CDRs are produced in csv – comma separated value – format.

7. One billing CDR is produced per call transiting the Vega. Please see Table 3 for the format of the billing CDRs.

8. Vegas support a specific login for billing CDR record collection - the billing user. Once logged in only billing records can be collected, no Vega parameters may be altered.

9. To collect CDR data from a Vega, typically an external program has to be written that will log into the Vega (serial or telnet interface). It should then issue the "bill on" or "bill Z" command, then "bill display on" and collect the data returned. The program should store this data in its own file. If the file lills, or the program needs to change file, it may issue a "bill display off" command, change the file to which it is storing the records, then re-issue a "bill display on". During the “off” period the Vega will buffer CDR records in its internal buffer – up to the configured buffer length. (See warning below.) When the billing display is re-enabled the Vega will display the records stored in the buffer (from oldest to newest) and then return to displaying CDRs as they are produced.
Almost any coding environment can be used for generating the billing CDR collection program, for instance Visual Basic, Expect, Perl, C or Visual C.
Note. The default configuration of the Vega is such that "bill display on" is implied when logging in as a billing user. This can be changed through the web browser Users>Billing User>Billing (0="bill display off" at login, 1="bill display on" at login).

10. The sequence number in the CDR can be used to check for any lost (or duplicated) billing CDR entries. The first record after a reboot is always sequence number 1.

11. An alert threshold can be configured such that a warning event is issued at the configured buffer occupancy level (`bill_warn_threshold`).

12.  From Release 6, the call start time field reports the start time of all call events – e.g. for ISDN, the SETUP time. The duration field holds the time from answer to cleardown. The time to make the connection can be calculated from the difference between the end time minus start time and the duration.

WARNING!

If the billing log buffer ever gets full then billing CDRs must be discarded, so if billing records are required it is important that they are removed from the buffer in real time – i.e. use `bill display on`.

Prior to release 6, if the buffer fills, the new billing CDR is discarded; from  **release 6 onwards, if the buffer fills, the newest billing CDR overwites the oldest billing CDR.**

WARNING!

If the date time is altered during a call (e.g. through a user interface or through an NTP time update), although the duration will correctly reflect the answer to cleardown time, the start time will be based on pre-update time and the end time based on after-update time.

Other related documents

Please also see the billing FAQ on the www.VegaStreamSupport.com web site, and also the Vega primer and IN_07-Radius_Accounting.

Tables

Table 1:

One CDR record is produced per call transiting the Vega; the call duration is taken from Answer to Disconnect – as specified below:

Product / call type	Answer	Disconnect
Vega 100 and Vega 50 BRI		
Vega 100 and Vega 50 BRI – VoIP to telephony	Answer received from ISDN	Earliest of: 1. disconnect received from ISDN 2. disconnect received from VoIP
Vega 100 and Vega 50 BRI – telephony to VoIP	Answer received from VoIP	Earliest of: 1. disconnect received from ISDN 2. disconnect received from VoIP
Vega 100 and Vega 50 BRI – telephony to telephony	Answer received from destination ISDN	Earliest of: 1. disconnect received from called ISDN 2. disconnect received from calling ISDN

Product / call type	Answer	Disconnect
Vega 50 FXO		
Vega 50 FXO – VoIP to telephony	Either: 1. If line current reversal is enabled and supported by the PBX, Answer is indicated by the PBX reversing line current from the Idle to Active state. 2. Otherwise no answer signal is available on analogue signaling, so CDR call time is started on outgoing call seize (call time will include dial tone, dialing and ring tone / busy / other progress tone)	Earliest of: 1. disconnect received from VoIP 2. [1]If enabled and supported by the PBX – loop current disconnect indication of call clear from the PBX 3. [1]If enabled and supported by the PBX – line current reversal return to the idle state indication of call clear from the PBX
Vega 50 FXO – telephony to VoIP	Answer received from VoIP	Earliest of: 1. disconnect received from VoIP 2. [1]If enabled and supported by the PBX – loop current disconnect indication of call clear from the PBX 3. [1]If enabled and supported by the PBX – line current reversal return to the idle state indication of call clear from the PBX
Vega 50 FXO – telephony to telephony	Either: 1. If line current reversal is enabled and supported by the PBX, Answer is indicated by the PBX reversing line current from the Idle to Active state. 2. Otherwise no answer signal is available on analogue signaling, so CDR call time is started on outgoing call seize (call time will include dial tone, dialing and ring tone / busy / other progress tone)	[2]Either: 1. [1]If enabled and supported by the PBX – loop current disconnect indication of call clear from the PBX 2. [1]If enabled and supported by the PBX – line current reversal return to the idle state indication of call clear from the PBX

[1] Only loop current disconnect or line current reversal can be enabled – these functions are mutually exclusive.
[2] If neither loop current disconnect or line current reversal are enabled and supported – telephony to telephony calls can never clear!

Product / call type	Answer	Disconnect
Vega 50 FXS		
Vega 50 FXS – VoIP to telephony	Answer received from attached handset (off-hook / seize)	Earliest of: 1. disconnect received from attached handset (on-hook) 2. disconnect received from VoIP
Vega 50 FXS – telephony to VoIP	Answer received from VoIP	Earliest of: 1. disconnect received from attached handset (on-hook) 2. disconnect received from VoIP
Vega 50 FXS – telephony to telephony	Answer received from attached handset (off-hook / seize)	Earliest of: 1. disconnect received from calling handset (on-hook) 2. disconnect received from called handset (on-hook)

Table 2:

Format of "`show bill`" billing CDRs:

```
admin  > show bill

BILLING LOG: enable=Suppress_Zero_Bills display=OFF

Start               End      Billed      Ca In   Out
------------------- -------- ----------- -- ---- ----
01/01/1999 01:13:39 01:13:45  0/00:00:02 16  13   05
                    from:TEL:5553000 to:TEL:0513 dest:TEL:13,TA:200.100.50.89
```

Field	Example from above	Comments
Start		
Call_start_date	01/01/1999	
Call_start_time	01:13:39	
End		
Call_end_time	01:13:45	
Billed		
Call_duration_days	0/	
Call_duration_HH:MM:SS	00:00:02	
Ca		
Call_clear_reason	16	
In		
Inbound_interface	13	
Out		
Outbound_interface	05	
Calling party, called party and other available tokens	from:TEL:5553000 to:TEL:0513 dest:TEL:13,TA:200.100.50.89	

Table 3:

Format of "`bill display on`" billing CDRs:

```
BILL:,0000000001,01/01/1999,00:01:08,01/01/1999,00:01:19,0,00:00:05,16,02,05
,"from:TEL:201 to:TEL:502 dest:TA:200.100.50.96,TEL:201,DISP:outside_caller"

BILL:,0000000002,01/01/1999,00:02:17,01/01/1999,00:02:37,0,00:00:14,16,02,05
,"from:TEL:201 to:TEL:8903 dest:TA:200.100.50.96,TEL:201"

BILL:,0000000003,01/01/1999,00:02:47,01/01/1999,00:03:05,0,00:00:16,16,02,05
,"from:TEL:201 to:TEL:65420 dest:TA:200.100.50.96,TEL:201"
```

Field	Example from above	Comments
Start-of-line	BILL:	
Sequence_number	0000000001	Sequence number increases by 1 for every CDR produced.
Call_start_date	01/01/1999	
Call_start_time	00:01:08	
Call_end_date	01/01/1999	
Call_end_time	00:01:19	
Call_duration_days	0	
Call_duration_HH:MM:SS	00:00:05	
Call_clear_reason	16	
Inbound_interface	02	
Outbound_interface	05	
Calling party, called party and other available tokens	"from:TEL:201 to:TEL:502 dest:TA:200.100.50.96,TEL:201, DISP:outside_caller"	

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