



Reporting with ISR CME and UC520



June 2008

Topics Covered

- Call Detail Records (CDR) Support
- Billing Partners
- B-ACD reports
- Upcoming Tools/Features

Call Detail Records (CDRs)

- 3 CDR Formats Supported

 - Radius records

 - Comma Separated Value (available today with CME 4.3 for CME on ISR, UC520 with CME 7.0 in July '08)

 - Syslog

- For each of these you need a server (CSV format can be stored in router flash also)
- Partner solution/custom scripts are required to generate end user call accounting reports
- Radius and CSV are the recommended formats because they provide complete reporting

Syslog

- One server for both syslog debugs and CDR records
- Limited fields support – can be used for basic call accounting only
- Useful Syslog and Radius information:

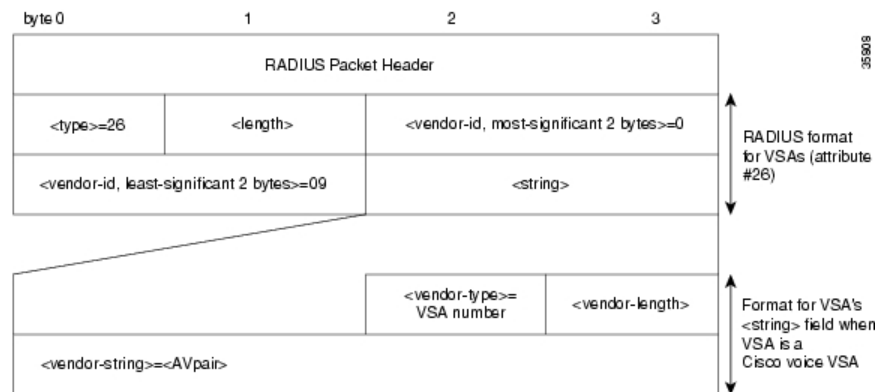
<http://zed.cisco.com/confluence/download/attachments/38912/CME+CDR+RADIUS-Syslog+Note.doc>

Radius CDR record format

- Radius:

Standard Radius fields

Voice & Fax VSAs



For more Information please see:

- RADIUS VSA Voice Implementation Guide:

http://www.cisco.com/en/US/products/sw/iosswrel/ps1835/products_programming_reference_guide09186a00800b5e17.html#wp1055471

- Configuring RADIUS:

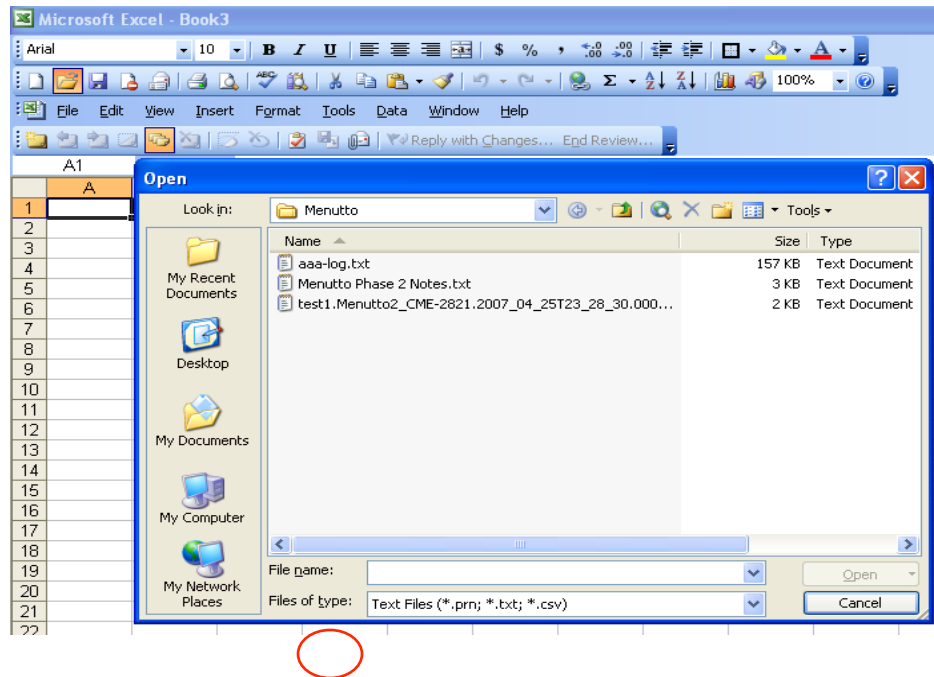
http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_cfg_radius.html

Comma Separated Value CDR format

- Introduced in CME 4.3 for CME on ISRs
- Will be introduced for 1861 and UC520 in 12.4(20)T in July '08
- New Format – Comma Separated Value
 - Readily importable into Microsoft Excel, etc.,
- Supports all the CDR fields
- Optionally a Compact format supported
- CDRs can be sent to a FTP server or written to router flash memory
- Support for switching over to a backup storage in case the primary fails

Comma Separated Value Format

- Only Stop records are generated
- Can be imported into programs like Microsoft Excel for custom report generation



- Example:

```
11775425750,1,1,1,"D4CD7CFC F2B811DB 8002B64B B07F7CD9","5102226001",,,,,,"16:09:19.586 pdt Wed  
Apr 25 2007",,,,,,"16:09:25.516 pdt Wed Apr 25 2007","16:09:35.506 pdt Wed Apr 25 2007","10 ",,"normal  
call clearing (16)",,,,,,0,0,0,0,"5102226001","5102226001",,,,,,"TWC","04/25/2007  
16:09:19.578","5102226001",,,,,,0,1,D4CD7CFC F2B811DB 8002B64B B07F7CD9,1,,,,,""
```

FTP Server support

- FTP download only supported with CSV format
- Router act as a FTP client, FTP server IP address and Username/Password is configurable
- CME writes to FTP server and/or router flash memory – periodically – configurable as “Flush timer”
“File Close Timer” is used to close the CDR file and start a new file
- CME router memory is used for temporary storage

Multiple simultaneous format support

- Simultaneous writes to –
 RADIUS, Syslog, FTP or
 RADIUS, Syslog, Flash
- On FTP write failure, automatically switch to flash or vice versa (if configured)

Primary Storage	Secondary Storage		
	RADIUS	Flash (CSV) or FTP (CSV)	Syslog
RADIUS	N/A	Simultaneous (Flash or FTP)	Simultaneous
FTP	Simultaneous	X	Simultaneous
Flash	Simultaneous	X	Simultaneous
Syslog	Simultaneous	Simultaneous (Flash or FTP)	N/A

Compact CDR format

- Most used fields reported in the compact CDR
- CSV format only
- Router can be configured to generate either detailed or compact format

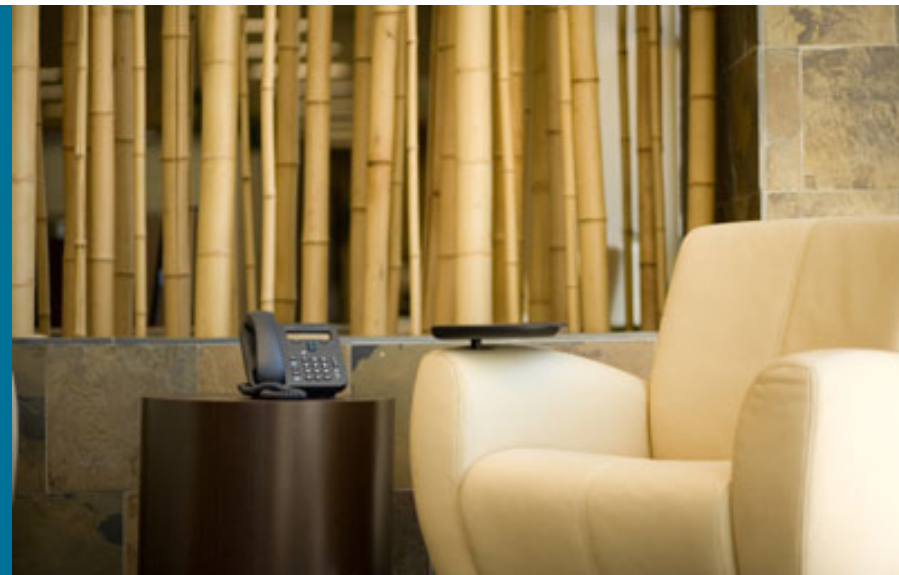
Comparison of various CDR formats

	Syslog	Radius	CSV w/ FTP
All Fields Supported	Limited Fields Supported	YES	YES with the option of Compact CDRs
Can be used for Real-time applications	NO	YES	NO
Built in Retries	NO	YES	Can store records on Flash on loss of connection to FTP server or CDR Tcl script can be used
Multiple use of the server	Same server can be used for debugs	Same server can be used as AAA server	No
Post processing	Easier than Radius but need to separate CDRs from debugs	Complex format	Simple with commonly available applications like Microsoft Excel

-CSV format recommended for most customers
 -Radius recommended for customers needing real time information



Partner Billing Solutions



TDP Partner Reporting Solutions

- ISI (www.isi-info.net)
 - Product: Infortel Select
 - One time buy and Lease models
- Stonevoice (www.stonevoice.com)
- Products:
 - Billy – Single Site
 - BillyBlues – Multisite – Currently supported for CUCM only – Should be available for CUCME in near



Note: For latest pricing information please contact ISI & Stonevoice directly



Infotel Select for CME



- Usage-based allocation of variable and fixed telecommunications expenses
- Identification of potential abuse or misuse
- Analysis of telephone-related employee productivity
- Analysis of traffic and trunk utilization for troubleshooting and facility planning
- Investigation of corporate security concerns
- Historical archive of call activity
- Filters on Cost/Duration/Time of Day/ANI/DNIS
- Custom Summary
- Graphical Reports



Infotel Select for CME

Print Preview (render time: 0:00:02.2)

File 1/57 Go to page:

Cisco San Jose - MCEBU Detail Report by Extension

Detail Report by Extension

From 9/28/2004 through 9/29/2004

Date	Time	Duration	Cost	Facility	Call Type	Phone Number	Location	Account / Matter
Data Source: Site 01 (1)								
Extension: 1001 - Smith, Tom								
09/28/2004	15:10	0:00:04	0.12	CCME Routers	LCL	571-2604	NORTHBROOK, IL	
09/28/2004	15:29	0:00:19	0.00	VoIP Cloud	INT	1002	INTERNAL	
09/28/2004	15:44	0:00:23	0.00	VoIP Cloud	INT	1002	INTERNAL	
09/28/2004	15:50	0:00:12	0.00	VoIP Cloud	INT	1002	INTERNAL	
09/28/2004	16:21	0:00:05	0.12	CCME Routers	LCL	571-2604	NORTHBROOK, IL	
Extension Total		0:01:03	0.24			Call Count: 5		
Extension: 1002 - Undefined, Extension 1002								
09/28/2004	15:30	0:00:12	0.00	VoIP Cloud	INT	1003	INTERNAL	
09/28/2004	15:45	0:00:15	0.00	VoIP Cloud	INT	1003	INTERNAL	
09/28/2004	15:50	0:00:07	0.00	VoIP Cloud	INT	1003	INTERNAL	
09/28/2004	17:57	0:00:22	0.08	CCME Routers	LCL	853-0930	WILMETTE, IL	
09/29/2004	08:59	0:01:05	0.24	CCME Routers	LCL	954-1688	DESPLAINES, IL	
09/29/2004	09:03	0:00:07	0.08	CCME Routers	LCL	853-3093	WILMETTE, IL	
09/29/2004	09:03	0:00:09	0.08	CCME Routers	LCL	853-0930	WILMETTE, IL	
09/29/2004	10:27	0:00:13	0.00	CCME Routers	INT	5001	INTERNAL	
09/29/2004	10:28	0:00:11	0.00	CCME Routers	INB	5003	INCOMING	
09/29/2004	10:28	0:00:07	0.00	VoIP Cloud	INT	1001	INTERNAL	
Extension Total		0:02:48	0.48			Call Count: 10		
Extension: 1003 - Undefined, Extension 1003								
09/29/2004	10:05	0:00:04	0.12	CCME Routers	LCL	571-2604	NORTHBROOK, IL	
Extension Total		0:00:04	0.12			Call Count: 1		
Extension: 2001 - Undefined, Extension 2001								
09/28/2004	17:59	0:03:00	0.00	CCME Routers	INT	3002	INTERNAL	
09/28/2004	18:02	0:03:00	0.00	CCME Routers	INT	3002	INTERNAL	
09/28/2004	18:05	0:00:38	0.00	CCME Routers	INT	3002	INTERNAL	
09/28/2004	18:07	0:02:34	0.00	CCME Routers	INT	3002	INTERNAL	

9/29/2004 at 10:30 AM

1

ISI - www.isi-info.com

STONEVOICE Billy – Accounting and Billing Report

- Completely Web based.
- Administrator and User access. Users can analyze the details of their personal calls.
- Support of different reports (web, csv, xls, pdf) live or scheduled
- Collects internal, incoming and outgoing call detail records.
- Allows prefix group definition in order to identify a range of prefix for call cost calculation
- Support of cost center information for department billing.
- Allows personal filters definition and saving.
- Allows applying multiple filters (logical AND) to the displayed data.
- Allows records ordering by clicking on the column.
- It features a scheduler to configure automatic report generation based on the following parameters:
 - Time of the day
 - Day of the week or Days of the month
 - Personal filter
 - Periodical or One shot report generation
- Multilanguage support.

STONEVOICE Billy – Accounting and Billing Report

Stonevoice Application Suite - Microsoft Internet Explorer

Address: http://192.168.1.13/fw/frame/main.htm

STONEVOICE Application suite

SV Application Suite

- Main
- IVR Manager
 - Set parameters
 - Manage Behaviours
 - Schedule events
 - Scripts management
 - Audio files management
- SSAM
- Speedy
- Billy
 - Manage Service
 - Reports
 - Rates definition
 - Groups definition
 - Schedule reports
 - Personal calls
- Concerto
- CallBarring
- Idle URL Manager

Choose the filter: Caller, Called, Start Time, Duration, Date, Cost center

Applied condition :

Undo applied filter Clean selected from Database

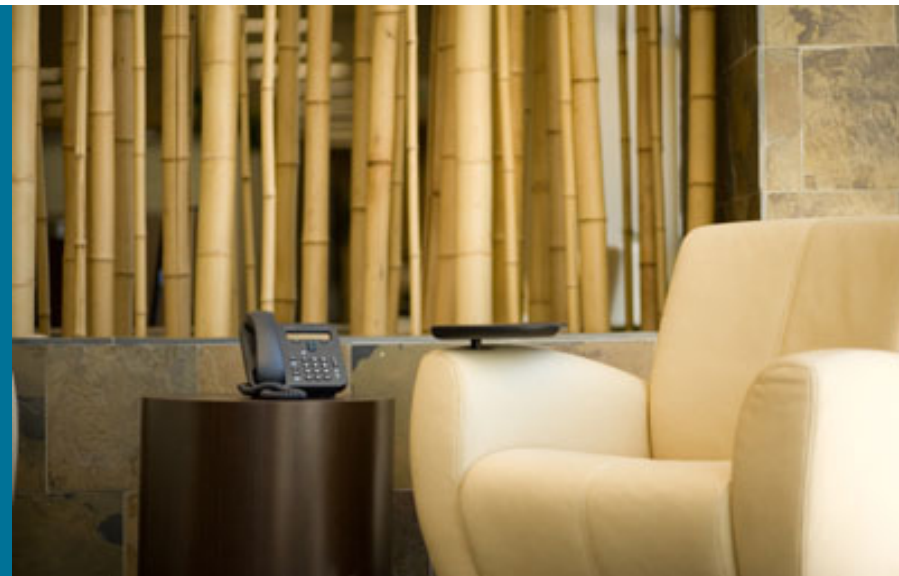
Caller	Called	Start Time	Duration	Date	Cost center	Cost (Euro)
4085550002	1XXX	18:01:16	00.01.53	2004/08/26	-	-
4085550001	1XXX	18:03:18	00.00.10	2004/08/26	-	-
4085550001	1XXX	18:03:51	00.00.13	2004/08/26	-	-
4085550002	1XXX	18:04:06	00.00.05	2004/08/26	-	-
4085550003	1XXX	18:04:15	00.00.24	2004/08/26	-	-
4085550001	1XXX	18:06:18	00.00.55	2004/08/26	-	-

Calls on this view : 1 - 6 Calls on this query : 6 Total calls : 6

Stonevoice - Billy - Billing System Ver. 2.0
Copyright 2002 © Computer Design - Stonevoice



B-ACD Reports




Basic ACD reports

- B-ACD has built-in reports
- Provides peg counts and averages for call agents and queues
- Can be uploaded every hour in a CSV format to a TFTP server automatically
- Excel Macro (provided FREE) is also available to parse the statistics and generate reports (example follows)
- ManageExpress™ from Arcana (a TDP partner) provides real time call agent status on Cisco IP Phones
- More information:

http://www.cisco.com/en/US/docs/voice_ip_comm/cucme/bacd/configuration/guide/40bacd.html#wp1002693

B-ACD report (using Excel Macro) – Main Screen

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Cisco CallManager Express Basic Reports							powered by sentinel								
2	Reset		Load Base Data		Daily Summary		Hourly Summary		Agent Summary		Agent Activity					
3																
4																
5																
6					for Hunt Group:		1				for Agent:		1001			
7																
8	Collection Time		Date	Initial Time	End Time	Hunt Group	Day Time	Record Type								
9	03:00:00 PST Mon Aug 21 2006		8/21/2006	0:00	1:00	1	Mon 00:00 - 01:00	HuntGp	0	0	0	0	0	0	0	0
10	04:00:00 PST Mon Aug 21 2006		8/21/2006	1:00	2:00	1	Mon 01:00 - 02:00	HuntGp	0	0	0	0	0	0	0	0
11	05:00:00 PST Mon Aug 21 2006		8/21/2006	2:00	3:00	1	Mon 02:00 - 03:00	HuntGp	0	0	0	0	0	0	0	0
12	06:00:00 PST Mon Aug 21 2006		8/21/2006	3:00	4:00	1	Mon 03:00 - 04:00	HuntGp	0	0	0	0	0	0	0	0
13	07:00:00 PST Mon Aug 21 2006		8/21/2006	4:00	5:00	1	Mon 04:00 - 05:00	HuntGp	0	0	0	0	0	0	0	0
14	08:00:00 PST Mon Aug 21 2006		8/21/2006	5:00	6:00	1	Mon 05:00 - 06:00	HuntGp	0	0	0	0	0	0	0	0
15	09:00:00 PST Mon Aug 21 2006		8/21/2006	6:00	7:00	1	Mon 06:00 - 07:00	HuntGp	0	0	0	0	0	0	0	0
16	10:00:00 PST Mon Aug 21 2006		8/21/2006	7:00	8:00	1	Mon 07:00 - 08:00	HuntGp	0	0	0	0	0	0	0	0
17	11:00:00 PST Mon Aug 21 2006		8/21/2006	8:00	9:00	1	Mon 08:00 - 09:00	HuntGp	0	0	0	0	0	0	0	0

B-ACD report (using Excel Macro) – Agent Summary

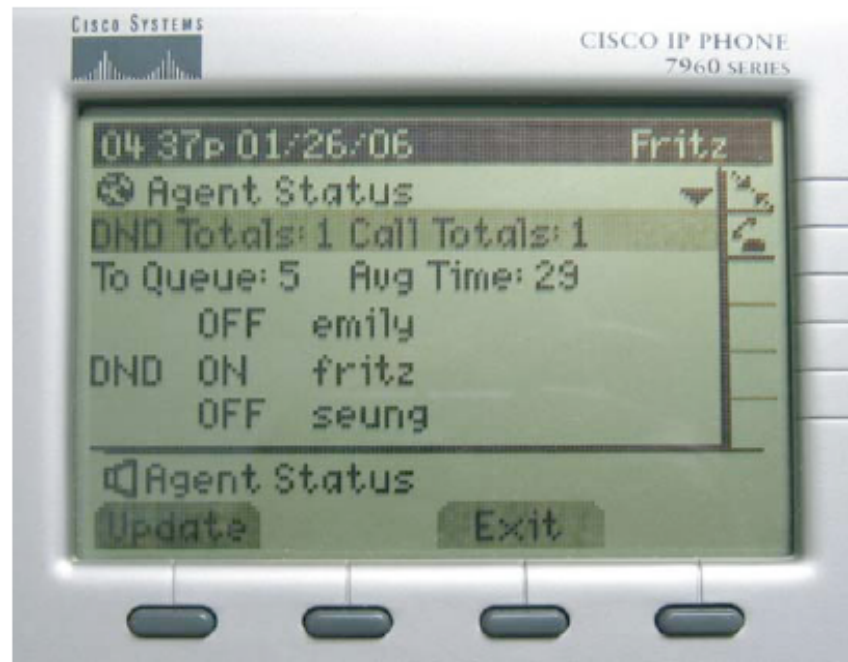
Agent Summary Report														
Hunt Group 1		All Agents										8/2		
From Direct Calls								From Queue						
Agent	Total Calls	Total Time	Average Time in Call	Longest Time in Call	Total Calls on Hold	Average Hold Time	Longest Hold Time	Total Calls	Total Time	Average Time in Call	Longest Time in Call	Total Calls on Hold	Average Hold Time	H
		<i>min</i>	<i>sec</i>	<i>sec</i>		<i>sec</i>	<i>sec</i>		<i>min</i>	<i>sec</i>	<i>sec</i>		<i>sec</i>	
1001	5	1:00	12	14	1	1	1	2	0:23	7	10	1	1	
1002	1	0:33	20	20	1	4	4	3	0:20	4	5	2	1	
Day	6	1:33	13	20	2	3	4	5	0:43	5	10	15	1	

B-ACD report (using Excel Macro) – Hourly Summary

Hourly Summary Report													
Hunt Group 1 All Agents 8%													
From Direct Calls							From Queue						
Time	Total Calls	Total Time	Average Time in Call	Longest Time in Call	Total Calls on Hold	Average Hold Time	Longest Hold Time	Total Calls	Total Time	Average Time in Call	Longest Time in Call	Total Calls on Hold	Average Hold Time
		<i>min</i>	<i>sec</i>	<i>sec</i>		<i>sec</i>	<i>sec</i>		<i>min</i>	<i>sec</i>	<i>sec</i>		<i>sec</i>
12:00 AM	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0
1:00 AM	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0
2:00 AM	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0
3:00 AM	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0
4:00 AM	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0
5:00 AM	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0
6:00 AM	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0
7:00 AM	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0
8:00 AM	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0
9:00 AM	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0
10:00 AM	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0
11:00 AM	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0
12:00 PM	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0

ManageExpress™ from Arcana

- ArcanaNetworks' ManageExpress™ VoIP AgentStatus PS provides Call Agent Status on Cisco IP Phones that are connected to Cisco Call Manager Express
- Supervisors can view real time status of their agents on the display of their Cisco IP Phone.





Upcoming Tools/ Features



CME CDR support coming up in 12.4(22)T

- **Call Hold Support :**

 - Identify the time a call is placed on hold: between hold and resume

 - Hold Reason: transfer, forward, park, conference

- **Shared Line Support:**

 - Identify if the shared-dn is in the call

 - Identify the actual phone Involved in the call (username & ephone ID)

SRST CDR enhancements

- **New Field (ip-pbx-mode)**

Identify mode - CME/SRST or Regular GW

CDR records generated during SRST mode can be used along with the CUCM records to get complete call accounting picture

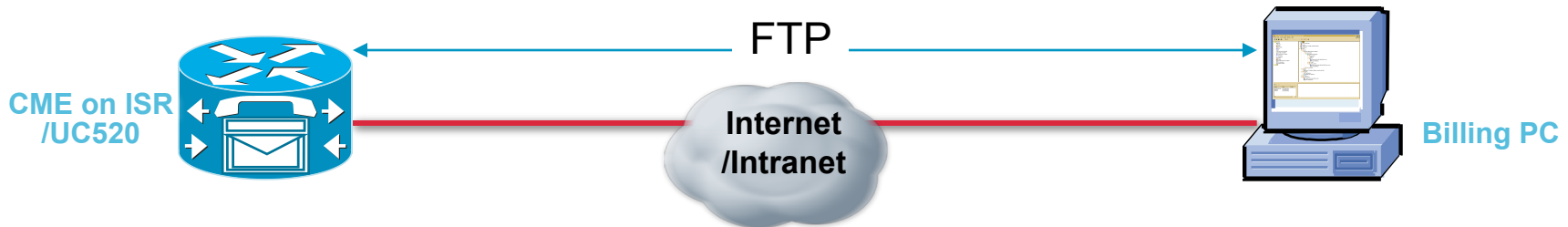
- **New Tcl script that runs periodically on the router to upload the CDR to a central FTP server**

Can be used along with the ip-pbx-mode above to upload all the CDR records to a central billing server

CDR reporting tool (July/August '08)

- It is a standalone script written in Javascript
- Available free of charge
- Tested on a Windows based PCs using Internet Explorer
- Generates basic calls report for a user specified date range
- Generates simplified CSV file which can be imported into Microsoft Excel (or similar) to generate custom reports
- Requires the new CSV CDR format

How CDR reporting tool works



Step 1. CME system generates CDRs in CSV format

Step 2. CME system sends the CDR to the FTP server on the CDR reporting PC (*standalone FTP server is needed*)

Step 3. FTP server stores the CDR files in a dedicated directory

Step 4. User Launches the CDR Reporting tool in the IE browser and specifies the date range for billing report generation

Step 5. CDR Reporting tool generates the Billing Report and displays it in the IE and also generates a simplified CSV file

More Information

- Radius Voice VSA Information:

<http://www.cisco.com/en/US/docs/ios/voice/vsa/developer/guide/vsaig3.html>

- Useful Radius and Syslog Information:

<http://zed.cisco.com/confluence/download/attachments/38912/CME+CDR+RADIUS-Syslog+Note.doc>

- CSV CDR Format:

<http://www.cisco.com/en/US/docs/ios/voice/vsa/feature/guide/itfileac.html>

- B-ACD Statistics:

http://www.cisco.com/en/US/docs/voice_ip_comm/cucme/bacd/configuration/guide/40bacd.html#wp1002693

- Partner Tools: www.isi-info.com and www.stonevoice.com



Backup



Compact Format fields

S.No.	Field Name	Description
1	unix_time	System timestamp when CDR is captured.
2	call-id	Value of the Call-ID header
3	cdr-type	0=none, 1=call history detail, 2=custom template
4	leg-type	Call leg type: 1= telephony, 2=VoIP, 3=MMOIP, 4=Fraserelay, 5=ATM
5	h323-conf-id	Unique call identifier generated by the gateway. Used to identify the separate billable events (calls) within a single calling session.
6	peer-address	Number that this call was connected to in E.164 format.
7	peer-sub-address	Sub address that is configured under a dial peer
8	h323-setup-time	Setup time in Network Time Protocol (NTP) format: hour, minutes, seconds, microseconds, time_zone, day, month, day_of_month, year.
9	alert-time	Time at which call is alerting.
10	h323-connect-time	Connect time in NTP format: hour, minutes, seconds, microseconds, time_zone, day, month , day_of_month, year.
11	h323-disconnect-time	String Disconnect time in NTP format: hour, minutes, seconds, microseconds, time_zone, day, month, day_of_month,, year
12	h323-disconnect-cause	String Q.931 disconnect cause code retrieved from Cisco IOS call-control application programming interface(CCAPI).

Compact Format fields (Contd..)

S.No.	Field Name	Description
13	disconnect-text	String ASCII text describing the reason for call termination
14	h323-call-origin	String Gateway's behavior in relation to the connection that is active for this leg. answer = Legs 1 and 3, originate = Legs 2 and 4, callback = Legs 1 and 3
15	charged-units	Number of charged units for this connection. For incoming calls or if charging information is not supplied by the switch, value is zero
16	info-type	String Type of information carried by media1- other 9 not described) 2 - speech3- unrestrictedDigital 4-unrestrictedDigital56 5- restrictedDigital 6- audio31 7 - audio7 8 – video 9-packetSwitched
17	paks-out	Total number of transmitted packets
18	bytes-out	Total number of transmitted bytes
19	paks-in	Total number of packets received.
20	bytes-in	Total number of bytes received
21	username	Username used for authentication. In most of cases this is the same as calling number
22	clid	Calling number
23	dnis	Called number.

Flash as CDR storage

- Flash can be configured as the primary or the secondary storage
- A new flash file created for every expiry of the File Close timer
- Files on flash can be extracted as and when needed by the external application