

CDR Logging Configuration with Syslog Servers and Cisco IOS Gateways

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Introduction

Customers sometimes have a requirement to log Call Detail Records (CDRs) from Voice over IP (VoIP) systems for accounting or billing purposes. The recommended way to do this is with an external authentication, authorization, and accounting (AAA) server (RADIUS or TACACS). These AAA systems often provide CDR logging, post call record processing, and a billing report generation facility.

There can be some situations where the complexity or cost of the AAA server prohibits its use, but there is still a requirement for CDR logging. In such a case, it is possible to use the syslog capabilities of the Cisco gateway or router to log VoIP CDRs to an external syslog server. These records are in comma separated variable (CSV) format. They can easily be loaded and processed by an external software application such as a spreadsheet or a database. The syslog server software can run on a basic PC. Basic syslog server applications can be downloaded from the Internet. Cisco makes no recommendations on any particular type or version of syslog server software.

Syslog uses User Datagram Protocol (UDP) as the underlying transport mechanism, so the data packets are unsequenced and unacknowledged. It is possible that on a heavy utilized network, some packets can be dropped and therefore CDR information is lost. Multiple syslog servers can be specified for redundancy.

For the timestamp on the CDR to be correct, there is a requirement for the Cisco IOS® router or gateway to be configured for time synchronization via a Network Time Protocol (NTP) time source. If the router has no NTP synchronization, the start and stop times of each CDR will be a zero (null) value. If an external NTP source is not available, the router needs to be set as an NTP master. This is explained in the Configuration section.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

This document is not restricted to specific software and hardware versions.

Conventions

Refer to Cisco Technical Tips Conventions for more information on document conventions.

Configuration

This is a sample configuration that enables the router to generate VoIP CDRs and send them to an external syslog server:

```
router(config)#service timestamps log datetime msec localtime
!
!--- Ensures that the records are timestamped with an accurate value.
!
router(config)#aaa new-model
!
router(config)#aaa authentication login default none
!
!--- Enables AAA to prevent Telnet authentication via AAA.
router(config)#aaa accounting connection h323 start-stop radius
!
!--- Generates the H.323 call start/stop CDRs.
router(config)#gw-accounting syslog
!
!--- Sends the H.323 CDRs to the syslog server.
router(config)#logging 10.64.6.250
!
!--- The IP address of the syslog server. Multiple syslog servers
!--- can be specified for redundancy.
```

NTP must run on the Cisco IOS router or gateway to ensure the H.323 start/stop records have the correct time value. These are the two methods of NTP:

- Use this Cisco IOS software global configuration command to synchronize the Cisco IOS router or gateway to an external NTP server:

```
router(config)#ntp server ip address
```

ip address The IP address of the time server that provides the clock synchronization.

- If there is no external NTP time source, use the internal clock as the time source. This is done with the Cisco IOS software global configuration command shown here:

```
router(config)#ntp master
```

The router clock should be set to the correct time (from normal EXEC mode) with this command to ensure that the timestamps are correct:

```
router#clock set 15:15:00 8 May 2001
```

Note: On some Cisco platforms, the router clock is not backed up with a battery source. The system time needs to be reset after a router reload or power failure.

Sample CDR Output

This is a portion of console output from the router. When the configuration in this document is enabled, the CDRs are directed to the router console as well as the syslog server. In order to remove the logging from the router console, configure **no logging console** in global configuration mode on the router. This prevents the CDRs and other system messages from appearing on the console, but they are still logged to the syslog server.

When a VoIP call is made, it places a call in the forward direction to the destination. The destination makes a return call to get a full duplex VoIP connection to occur. Therefore, there is a CDR for the forward leg, and a second CDR for the return leg. The forward call leg has a *call origin* of 2 while the return call leg has a *call origin* of 1.

Note: Some output lines are broken into multiple lines for printing purposes.

```
router#  
  
!--- This output is for the forward call leg.  
  
Jun 18 11:15:02.867: %VOIPAAA-5-VOIP_CALL_HISTORY: CallLegType 1, ConnectionId BA55719E  
F8C10015 0 1B1E08, SetupTime 11:14:39.367 UTC Mon  
Jun 18 2001, PeerAddress 68575, PeerSubAddress , DisconnectCause 10 , DisconnectText  
normal call clearing., ConnectTime 11:14:49.707 UTC Mon  
Jun 18 2001, DisconnectTime 11:15:02.867 UTC Mon Jun 18 2001, CallOrigin 2,  
ChargedUnits 0, InfoType 2, TransmitPackets 1509, TransmitBytes 102600,  
ReceivePackets 1510, ReceiveBytes 138920  
  
router#  
  
!--- This output is for the reverse call leg.  
  
Jun 18 11:15:02.983: %VOIPAAA-5-VOIP_CALL_HISTORY: CallLegType 1, ConnectionId BA55719E  
F8C10015 0 1B1E08, SetupTime 11:14:41.683 UTC Mon  
Jun 18 2001, PeerAddress 2887, PeerSubAddress , DisconnectCause 10 , DisconnectText  
normal call clearing., ConnectTime 11:14:49.703 UTC Mon  
Jun 18 2001, DisconnectTime 11:15:02.983 UTC Mon Jun 18 2001, CallOrigin 1,  
ChargedUnits 0, InfoType 2, TransmitPackets 1510, TransmitBytes 102692,  
ReceivePackets 1509, ReceiveBytes 138828  
  
router#
```

This CDR shows:

Forward Call Leg	
Time CDR generated	: Jun 18 11:15:02.867
Unique connection ID	: BA55719E F8C10015 0 1B1E08
Setup Time	: 11:14:39.367 UTC Mon Jun 18 2001
PeerAddress (Calling number)	: 68575
Disconnect Cause Code	: 10
Disconnect Cause Text	: normal call clearing
Connect Time	: 11:14:49.707 UTC Mon Jun 18 2001
Call Origin	: 2

Disconnect Time	: 11:15:02.867 UTC Mon Jun 18 2001
Transmit Packets	: 1509
Transmit Bytes	: 102600
Receive Packets	: 1509
Receive Bytes	: 138828

Return Call Leg	
Time CDR generated	: Jun 18 11:15:02.983
Connection ID	: BA55719E F8C10015 0 1B1E08
Setup Time	: 11:14:41.683 UTC Mon Jun 18 2001
PeerAddress (Called number)	: 2887
Disconnect Cause Code	: 10
Disconnect Cause Text	: normal call clearing
Connect Time	: 11:14:49.703 UTC Mon Jun 18 2001
Call Origin	: 1
Disconnect Time	: 11:15:02.983 UTC Mon Jun 18 2001
Transmit Packets	: 1510
Transmit Bytes	: 102692
Receive Packets	: 1509
Receive Bytes	: 138828

The disconnect cause code values default to hexadecimal. This table shows some common hexadecimal values and their explanations:

Hexadecimal Value	Explanation
0x0	See Note Below
0x1	Unassigned number
0x3	No route to destination
0x10	Normal call clearing
0x11	User busy
0x12	No user response
0x13	No user answer
0x15	Call rejected
0x1C	Invalid number
0x1F	Normal, unspecified

0x22	No circuit
0x2C	No requested circuit
0x2F	No resource
0x3F	Service or option not available, unspecified

Note: Some Cisco IOS software releases might give many Disconnect Cause Code "0" messages when the **show h323 gateway cause-codes** command is issued. It is a cosmetic defect and does not have any impact on performance.

Related Information

- [Troubleshoot and Debug VoIP Calls – the Basics](#)
 - [Voice Technology Support](#)
 - [Voice and IP Communications Product Support](#)
 - [Recommended Reading: Troubleshooting Cisco IP Telephony](#)
 - [Technical Support & Documentation – Cisco Systems](#)
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