

This article describes how to manage the collection of voice statistics on the gateway and documents the following tasks:

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- [Configuring the Gateway to Archive Statistics to an FTP Server](#)
- [Configuring the Gateway to Archive Statistics to a Syslog Server](#)
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- [Displaying All Statistics and Pushing Them to an FTP or Syslog Server](#)
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Configuring the FTP Server to Enable Archiving of Statistics from the Gateway

This task shows how to configure the FTP server to accept archived statistics from a Cisco IOS gateway.

Prerequisites

FTP Server

An FTP server must be configured before you can archive the collected statistics.


FTP Service Port

Normally, the FTP port is a well-known number, such as 21. However, another port number (not well-known) can receive data for specific purposes (for example, security), as long as the FTP client on voice gateways is configured to use the same port number.

User Account and File Directory

In order for the FTP client on the voice gateway to write files on the FTP server, FTP user accounts must be available (or well-known) to the FTP client. The FTP user accounts can be normal UNIX user accounts.

The FTP file upload directory in the FTP servers can also be specified for directory management purposes. System administrators can also restrict the privilege level of the user accounts in the upload directory for security and directory management purposes.

 **Note:** For this task, the external devices are assumed to be UNIX-like platforms (for example, Linux).
1. Install the software.

Ensure that both the anonftp package and the wu-ftpd package are installed on the system. The versions installed should, at a minimum, match those below:

```
anonftp-3.0-9
wu-ftpd-2.6.1-6
```

Check to see whether the installation can be done with the following command:

```
rpm -qa | egrep '(wu-ftp|anonftp)'
```

2. Configure the IP aliasing for virtual domains.

Configure the IP aliases for the virtual domains so that there is an IP address routed through one of the available network interfaces.


The programs "netcfg" or "linuxconf" can also be used to set up the IP aliases (replacing 10.10.10.10 with your actual IP address for the FTP site).

If the IP address is to resolve to a domain name, you must set up a DNS server.

3. Configure xinetd.conf.

Configure the /etc/xinetd.d/wu-ftp file to handle FTP access, for example:

```
[root@wyvern xinetd.d]# cat wu-ftp
# default: on
# description: The wu-ftp FTP server knows the FTP
# connections. It uses \ normal,unencrypted
# usernames and passwords for authentication.
service ftp
{
    disable                = no
    socket_type            = stream
    wait                   = no
    user                   = root
    server                 = /usr/sbin/in.ftpd
    server_args            = -l -a
    log_on_success         += DURATION USERID
    log_on_failure         += USERID
    nice                   = 10
}
```

 **Note:** It is very important that the "-l -a" is specified in server_args and that the disable line is set to "no." This tells inetd.conf to reference the commands in the /etc/ftpaccess file.

4. Edit /etc/ftpaccess.

Edit the /etc/ftpaccess file. Make the basic changes using Linuxconf as the root. Additional changes must be made in this file manually. The virtual entry in the file should be placed at the bottom of the file and resembles the following:

```
# Virtual FTP entries for 10.10.10.10
virtual 10.10.10.10 root /home/domain1
virtual 10.10.10.10 banner /home/ftp/domain1/banner.msg
virtual 10.10.10.10 logfile /var/log/virtual/domain1/xferlog
```

Where /home/domain1 is the root path for the virtual FTP server, /home/ftp/domain1/banner.msg is the path to the banner message to be displayed upon login, and /var/log/virtual/domain1/xferlog is the path to the transfer log.

5. Specify other options.

Specify that all users can have access with the following line:

```
virtual 10.10.10.10 allow *
```

If only specific users are to be allowed access, list their usernames, as shown here:

```
virtual 10.10.10.10 allow user1
```

If anonymous FTP logins are to be disabled, set the IP address to private as shown here:

```
virtual 10.10.10.10 private
```

6. Secure or hide the FTP server.

When FTP users log on to the system, they should be allowed into the directory specified in the root path only. There are several steps as follows:

1. Determine whether or not there is one user or a group of users that will be logging into the virtual FTP site.
2. Specify the home directory in the `/etc/passwd` file for the user specified in the `/etc/ftpaccess/` file, followed by a `./.`. The entry will look like this:

```
user1:X:2453:group1::/var/ftp/home/domain1/./:/bin/bash
```

Include the following line in your FTP access file, if user1 is the only user accessing this virtual FTP site, following the virtual configuration lines:

```
guestuser user1
```

When logging into 10.10.10.10, user1 is automatically dropped into `/home/domain1` but will see this as the `/` directory. User1 will not be able to move outside of that directory.

3. Specify a group of users in addition to user1 in `/etc/group`. You should then add the following line to `/etc/ftpaccess` following the virtual FTP entry:

```
guestgroup group1
```

4. Specify the administrator of the FTP site (user2 in the example and exempt from the group rule) as follows:

```
guestgroup group1  
realuser user2
```

7. Provide for basic shell access.

Open the `/var/ftp` (created on the system when the `anonftp` rpm was installed), and copy `/var/ftp/bin`, `/var/ftp/etc/`, and `/var/ftp/lib` into the root directory of the virtual FTP site (in this case, `/var/ftp/home/domain1`).

8. Restart services so that the configuration takes effect.

Close the configuration file after making all of the changes, and restart the inet services (where FTP services are specified) by typing the following:

```
/sbin/service xinetd stop
```

then:

```
/sbin/service xinetd start
```

Configuring the Gateway to Archive Statistics to an FTP Server

This task shows you how to configure the gateway to archive the collected statistics to the specified FTP server and how to configure the maximum allowable file size.

 **Note:** This procedure can also be used to archive Cisco VoIP internal error codes (IECs) to an FTP server.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **voice statistics push ftp url *ftp-url* [max-file-size *value*]**
4. **exit**

DETAILED STEPS

	Command or Action	Purpose
1.	enable Example: <pre>Router> enable</pre>	Enables privileged EXEC mode. <ul style="list-style-type: none">• Enter your password if prompted.
2.	configure terminal Example: <pre>Router# configure terminal</pre>	Enters global configuration mode.
3.	voice statistics push ftp url <i>ftp-url</i> [max-file-size <i>value</i>] Example: <pre>Router(config)# voice statistics push ftp url ftp://me:secret@abccompanyhost:23/products max-file-size 3000</pre>	Configures the FTP server location where statistics will be archived. The <i>ftp-url</i> argument is expressed in the following form: <code>ftp://user:password@host:port/path1/path2/</code> <ul style="list-style-type: none">• The max-file-size keyword is optional and specifies the maximum FTP file size, in bytes. The value argument has a valid range from 1024 to 4294967295. The default is 400000000 (4 GB).
4.	exit Example: <pre>Router(config)# exit</pre>	Exits global configuration mode.

Example

The following sample output is the message that you see on your console when the statistics are being archived to the FTP server:

```
Writing /ftp_files/vstats.3660-1.2002-04-25T020500Z !
Writing /ftp_files/vstats.3660-1.2002-04-25T020500Z.done !
```


DETAILED STEPS

	Command or Action	Purpose
1.	enable Example: <pre>Router> enable</pre>	Enables privileged EXEC mode. <ul style="list-style-type: none">• Enter your password if prompted.
2.	configure terminal Example: <pre>Router# configure terminal</pre>	Enters global configuration mode.
3.	voice statistics push syslog [max-msg-size value] Example: <pre>Router(config)# voice statistics push syslog</pre>	Archives voice statistics to an external syslog server and specifies the maximum syslog message size. <ul style="list-style-type: none">• The max-msg-size 'keyword is optional and specifies the maximum size in bytes of a voice statistics file to be pushed to the syslog server'. Valid values are from 1024 to 4294967295. The default value is 4000000000 (4 GB).
4.	exit Example: <pre>Router(config)# exit</pre>	Exits global configuration mode.

Displaying Memory Usage

This task shows you how to display memory usage either as an absolute value or as a percentage.

SUMMARY STEPS

1. **enable**
2. **show voice statistics memory-usage {all | csr | iec}**

DETAILED STEPS

	Command or Action	Purpose
1.	enable Example: <pre>Router> enable</pre>	Enables privileged EXEC mode. <ul style="list-style-type: none">• Enter your password if prompted.
2.	'show voice statistics memory-usage {'all' 'csr' iec} Example: <pre>Router(config)# show voice statistics memory-usage csr</pre>	Displays current memory usage (absolute or percentage).

Displaying All Statistics and Pushing Them to an FTP or Syslog Server

This task shows how to display all statistics and push them to an FTP or syslog server.

 **Note:** This procedure can also be used if you are collecting statistics for VoIP internal error codes (IECs).

SUMMARY STEPS

1. **enable**
2. **show voice statistics csr since-reset all [mode {concise | verbose}]**
3. **show voice statistics csr since-reset all push {all | ftp | syslog}**

DETAILED STEPS

	Command or Action	Purpose
1.	<p>enable</p> <p>Example:</p> <pre>Router> enable</pre>	<p>Enables privileged EXEC mode.</p> <ul style="list-style-type: none"> • Enter your password if prompted.
2.	<p>show voice statistics csr since-reset all [mode {concise verbose}]</p> <p>Example:</p> <pre>Router# show voice statistics csr since-reset all mode concise</pre>	<p>Displays all statistics (including both signaling and accounting statistics) since the last reset or reboot of the gateway.</p>
3.	<p>show voice statistics csr since-reset all push {all ftp syslog} Example:</p> <pre>Router# show voice statistics csr since-reset all push syslog</pre>	<p>Pushes all displayed statistics to either the FTP or syslog server, or to both servers.</p> <ul style="list-style-type: none"> • The statistics are first displayed on the console before being pushed to the FTP or syslog server.

Clearing the Collected Call Statistics

This task shows you how to clear the collected statistics. The results of the **clear voice statistics csr** command can be viewed using the **show voice statistics** command.

Once the **clear voice statistics csr** command has been issued, all statistics collected using the **voice statistics time-range since-reset** command are removed and the counters are reset.

Restrictions

Only since-reset counters can be reset. Specific or periodic counts cannot be reset using the **clear voice statistics csr** command. This command cannot be used in nonprivileged mode.

SUMMARY STEPS

1. **enable**
2. **clear voice statistics csr**
3. **show voice statistics csr since-reset all**

DETAILED STEPS

	Command or Action	Purpose
1.	enable Example: Router> enable	Enables privileged EXEC mode. • Enter your password if prompted.
2.	clear voice statistics csr Example: Router# clear voice statistics csr	Clears the collected statistics.
3.	show voice statistics csr since-reset all Example: Router# show voice statistics csr since-reset all	Displays the collected statistics since a reset occurred. Enter this command after entering the clear voice statistics csr command to verify that the statistics have been cleared.

Troubleshooting Tips

The gateway does not recognize the **clear voice statistics csr** command in nonprivileged mode and displays the following message:

```
Router> clear voice statistics csr
      ^
% Invalid input detected at '^' marker.
```

If you see this message, enter this command from privileged EXEC mode.

Monitoring the Statistical Reporting

This section contains the following subsections:

- [Using Debug Commands for Monitoring Gateway Reporting](#)
- [Using Cause Code Statistics](#)
- [Displaying Quality of Service Indicators](#)

Using Debug Commands for Monitoring Gateway Reporting

To monitor the statistical reporting and the collection of data by the gateway, you must turn on the following debug commands:

- debug radius accounting
- debug event-manager
- debug voice statistics csr
- debug voice statistics accounting
- debug voice statistics core

Once the debugging is turned on, you can review the data, evaluate the performance of the network, and identify impaired voice equipment.

The following output examples show a collection of records occurring between intervals and a voice call going through the gateway.

Example of Record Collection Between Intervals

In the following example, the gateway was unable to "push" the data to the FTP server.

```
vstats_timer_handle_interval_event():Between Intervals!
04:52:37: vstats_acct_interval_end: interval_tag = 4
04:52:37: vstats_acct_interval_end: pushing out, tag=3
04:52:37: vstats_acct_clean_history_stats:
04:52:37: vstats_acct_clean_history_stats: stats (tag=3) not to be deleted
04:52:37: vstats_acct_clean_history_stats: stats (tag=2) not to be deleted
04:52:37: vstats_acct_create_empty_stats:
04:52:37: vstats_acct_create_new_rec_list:
04:52:37: vstats_acct_create_new_rec_list: add acct rec: methodlist=h323, acct-criteria=2
04:52:37: vstats_acct_create_new_rec:
04:52:37: vstats_acct_add_rec_entry:
04:52:37: vstats_acct_add_stats_entry:
04:52:37: vstat_push_driver_file_open():Cannot open ftp://sgcp:sgcp@abc-
pc:21//ftp_files/vstats.5400-GW.2003-02-13T162000Z. errno=65540=Unknown error 65540
vstat_push_drv_activate_ftp_file_tx():open file (ftp://sgcp:sgcp@jeremy-
pc:21//ftp_files/vstats.5400-GW.2003-02-13T162000Z)=(ftp://sgcp:sgcp@abc-
pc:21//ftp_files/vstats.5400-GW.2003-02-13T162000Z) failed!
vstats_push_api_push_formatted_text():Start CMD error!
```

Example of a Voice Call Going Through the Gateway

```
04:55:07: EM: Notify the producer not to produce
04:55:07: RADIUS(00000019): Storing nasport 0 in rad_db
04:55:07: RADIUS(00000019): Config NAS IP: 0.0.0.0
04:55:07: RADIUS(00000019): sending
04:55:07: RADIUS/ENCODE: Best Local IP-Address 10.6.43.101 for Radius-Server 10.6.10.203
04:55:07: RADIUS(00000019): Send Accounting-Request to 10.6.10.203:1646 id 21645/49,len496
04:55:07: RADIUS: authenticator C5 B8 AA 2E C3 AF 02 93 - 45 0B AE E5 B6 B2 99 1F
04:55:07: RADIUS: Acct-Session-Id [44] 10 "00000020"
04:55:07: RADIUS: Vendor, Cisco [26] 57
04:55:07: RADIUS: h323-setup-time [25] 51 "h323-setup-time=*16:22:30.994 UTC Thu Feb 13 20
04:55:07: RADIUS: Vendor, Cisco [26] 27
04:55:07: RADIUS: h323-gw-id [33] 21 "h323-gw-id=5400-GW."
04:55:07: RADIUS: Vendor, Cisco [26] 56
04:55:07: RADIUS: Conf-Id [24] 50 "h323-conf-id=2F4ED2E3 3EA611D7 800E0002 B935C14
04:55:07: RADIUS: Vendor, Cisco [26] 31
04:55:07: RADIUS: h323-call-origin [26] 25 "h323-call-origin=answer"
04:55:07: RADIUS: Vendor, Cisco [26] 32
04:55:07: RADIUS: h323-call-type [27] 26 "h323-call-type=Telephony"
04:55:07: RADIUS: Vendor, Cisco [26] 65
04:55:07: RADIUS: Cisco AVpair [1] 59 "h323-incoming-conf-id=2F4ED2E3 3EA611D7 800E000
04:55:07: RADIUS: Vendor, Cisco [26] 30
04:55:07: RADIUS: Cisco AVpair [1] 24 "subscriber=RegularLine"
04:55:07: RADIUS: Vendor, Cisco [26] 35
```

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```

04:55:07: RADIUS: Cisco AVpair [1] 29 "gw-rxd-cdn=ton:0,npi:0,#:11"
04:55:07: RADIUS: Vendor, Cisco [26] 32
04:55:07: RADIUS: Cisco AVpair [1] 26 "calling-party-category=9"
04:55:07: RADIUS: Vendor, Cisco [26] 33
04:55:07: RADIUS: Cisco AVpair [1] 27 "transmission-medium-req=0"
04:55:07: RADIUS: User-Name [1] 4 "22"
04:55:07: RADIUS: Acct-Status-Type [40] 6 Start [1]
04:55:07: RADIUS: NAS-Port-Type [61] 6 Async [0]
04:55:07: RADIUS: Vendor, Cisco [26] 20
04:55:07: RADIUS: cisco-nas-port [2] 14 "ISDN 6/0:D:1"
04:55:07: RADIUS: NAS-Port [5] 6 0
04:55:07: RADIUS: Calling-Station-Id [31] 4 "22"
04:55:07: RADIUS: Called-Station-Id [30] 4 "11"
04:55:07: RADIUS: Service-Type [6] 6 Login [1]
04:55:07: RADIUS: NAS-IP-Address [4] 6 10.6.43.101
04:55:07: RADIUS: Acct-Delay-Time [41] 6 0
04:55:07: RADIUS(0000001A): Config NAS IP: 0.0.0.0
04:55:07: RADIUS(0000001A): sending
04:55:07: RADIUS/ENCODE: Best Local IP-Address 10.6.43.101 for Radius-Server 10.6.10.203
04:55:07: RADIUS(0000001A): Send Accounting-Request to 10.6.10.203:1646 id 21645/50,len427
04:55:07: RADIUS: authenticator E4 98 06 8C 48 63 4F AA - 56 4F 40 12 33 F0 F5 99
04:55:07: RADIUS: Acct-Session-Id [44] 10 "00000021"
04:55:07: RADIUS: Vendor, Cisco [26] 57
04:55:07: RADIUS: h323-setup-time [25] 51 "h323-setup-time=*16:22:31.006 UTC Thu Feb 13 20
04:55:07: RADIUS: Vendor, Cisco [26] 27
04:55:07: RADIUS: h323-gw-id [33] 21 "h323-gw-id=5400-GW."
04:55:07: RADIUS: Vendor, Cisco [26] 56
04:55:07: RADIUS: Conf-Id [24] 50 "h323-conf-id=2F4ED2E3 3EA611D7 800E0002 B935C14
04:55:07: RADIUS: Vendor, Cisco [26] 34
04:55:07: RADIUS: h323-call-origin [26] 28 "h323-call-origin=originate"
04:55:07: RADIUS: Vendor, Cisco [26] 27
04:55:07: RADIUS: h323-call-type [27] 21 "h323-call-type=VoIP"
04:55:07: RADIUS: Vendor, Cisco [26] 65
04:55:07: RADIUS: Cisco AVpair [1] 59 "h323-incoming-conf-id=2F4ED2E3 3EA611D7 800E000
04:55:07: RADIUS: Vendor, Cisco [26] 30
04:55:07: RADIUS: Cisco AVpair [1] 24 "subscriber=RegularLine"
04:55:07: RADIUS: Vendor, Cisco [26] 30
04:55:07: RADIUS: Cisco AVpair [1] 24 "session-protocol=cisco"
04:55:07: RADIUS: Vendor, Cisco [26] 35
04:55:07: RADIUS: Cisco AVpair [1] 29 "gw-rxd-cdn=ton:0,npi:0,#:11"
04:55:07: RADIUS: User-Name [1] 4 "22"
04:55:07: RADIUS: Acct-Status-Type [40] 6 Start [1]
04:55:07: RADIUS: Calling-Station-Id [31] 4 "22"
04:55:07: RADIUS: Called-Station-Id [30] 4 "11"
04:55:07: RADIUS: Service-Type [6] 6 Login [1]
04:55:07: RADIUS: NAS-IP-Address [4] 6 10.6.43.101
04:55:07: RADIUS: Acct-Delay-Time [41] 6 0
04:55:07: EM: No consumer registered for event type NEWINFO
04:55:07: EM: Notify the producer not to produce
04:55:07: EM: No consumer registered for event type NEWINFO
04:55:07: EM: Notify the producer not to produce
04:55:08: RADIUS: no sg in radius-timers: ctx 0x65BAB1BC sg 0x0000
04:55:08: RADIUS: Retransmit to (10.6.10.203:1645,1646) for id 21645/50
04:55:08: RADIUS: acct-delay-time for 403963FC (at 403965A1) now 1
04:55:09: RADIUS: no sg in radius-timers: ctx 0x65ADB8EC sg 0x0000
04:55:09: RADIUS: Retransmit to (10.6.10.203:1645,1646) for id 21645/49
04:55:09: RADIUS: acct-delay-time for 40389BFC (at 40389DE6) now 1
04:55:10: RADIUS: no sg in radius-timers: ctx 0x65BAB1BC sg 0x0000
04:55:10: RADIUS: Fail-over to (10.8.159.105:1645,1645) for id 21645/51
04:55:10: RADIUS: acct-delay-time for 403963FC (at 403965A1) now 2
04:55:10: RADIUS/ENCODE: Best Local IP-Address 10.6.43.101 for Radius-Server 10.8.159.105
04:55:10: RADIUS: Received from id 21645/53 10.8.159.105:1645, Accounting-response, len 20
04:55:10: RADIUS: authenticator 57 EF DD 90 0F 88 76 EA - A5 3D A7 44 0D 90 66 16
04:55:10: vstats_acct_rsp_handler: methodlist=h323, rsp_type=0x1

```

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```
04:55:10: acct_rsp_status=1 callid= 26, incoming=0, leg=2
04:55:10: vstats_acct_rsp_handler: last acct msg not sent yet. methodlist: h323
04:55:10: RADIUS: no sg in radius-timers: ctx 0x65ADB8EC sg 0x0000
04:55:10: RADIUS: Fail-over to (10.8.159.105:1645,1645) for id 21645/52
04:55:10: RADIUS: acct-delay-time for 40389BFC (at 40389DE6) now 2
04:55:10: RADIUS/ENCODE: Best Local IP-Address 10.6.43.101 for Radius-Server 10.8.159.105
04:55:10: RADIUS: Received from id 21645/54 10.8.159.105:1645, Accounting-response, len 20
04:55:10: RADIUS: authenticator 97 88 6C BA DA 22 E7 5E - 73 EC 21 C6 36 1B 93 18
04:55:10: vstats_acct_rsp_handler: methodlist=h323, rsp_type=0x1
04:55:10: acct_rsp_status=callid= 25, incoming=1, leg=1
04:55:10: vstats_acct_rsp_handler: last acct msg not sent yet. methodlist: h323
04:55:13: RADIUS(0000001A): Config NAS IP: 0.0.0.0
04:55:13: RADIUS(0000001A): sending
04:55:13: RADIUS/ENCODE: Best Local IP-Address 10.6.43.101 for Radius-Server 10.6.10.203
04:55:13: RADIUS(0000001A): Send Accounting-Request to 10.6.10.203:1646 id 21645/55,len885
04:55:13: RADIUS: authenticator F8 4F F1 30 7E 8B 5B 46 - EF AE 17 2D 5C BA 36 E5
04:55:13: RADIUS: Acct-Session-Id [44] 10 "00000021"
04:55:13: RADIUS: Vendor, Cisco [26] 57
04:55:13: RADIUS: h323-setup-time [25] 51 "h323-setup-time=*16:22:31.006 UTC Thu Feb 13 20
04:55:13: RADIUS: Vendor, Cisco [26] 27
04:55:13: RADIUS: h323-gw-id [33] 21 "h323-gw-id=5400-GW."
04:55:13: RADIUS: Vendor, Cisco [26] 56
04:55:13: RADIUS: Conf-Id [24] 50 "h323-conf-id=2F4ED2E3 3EA611D7 800E0002 B935C14
04:55:13: RADIUS: Vendor, Cisco [26] 34
04:55:13: RADIUS: h323-call-origin [26] 28 "h323-call-origin=originate"
04:55:13: RADIUS: Vendor, Cisco [26] 27
04:55:13: RADIUS: h323-call-type [27] 21 "h323-call-type=VoIP"
04:55:13: RADIUS: Vendor, Cisco [26] 65
04:55:13: RADIUS: Cisco AVpair [1] 59 "h323-incoming-conf-id=2F4ED2E3 3EA611D7 800E000
04:55:13: RADIUS: Vendor, Cisco [26] 30
04:55:13: RADIUS: Cisco AVpair [1] 24 "subscriber=RegularLine"
04:55:13: RADIUS: Vendor, Cisco [26] 30
04:55:13: RADIUS: Cisco AVpair [1] 24 "session-protocol=cisco"
04:55:13: RADIUS: Vendor, Cisco [26] 35
04:55:13: RADIUS: Cisco AVpair [1] 29 "gw-rxd-cdn=ton:0,npi:0,#:11"
04:55:13: RADIUS: Vendor, Cisco [26] 59
04:55:13: RADIUS: h323-connect-time [28] 53 "h323-connect-time=*16:22:31.046 UTC Thu Feb 13
04:55:13: RADIUS: Acct-Input-Octets [42] 6 2241
04:55:13: RADIUS: Acct-Output-Octets [43] 6 81
04:55:13: RADIUS: Acct-Input-Packets [47] 6 113
04:55:13: RADIUS: Acct-Output-Packets [48] 6 5
04:55:13: RADIUS: Acct-Session-Time [46] 6 5
04:55:13: RADIUS: Vendor, Cisco [26] 62
04:55:13: RADIUS: h323-disconnect-tim[29] 56 "h323-disconnect-time=*16:22:36.070 UTC Thu Feb
04:55:13: RADIUS: Vendor, Cisco [26] 32
04:55:13: RADIUS: h323-disconnect-cau[30] 26 "h323-disconnect-cause=10"
04:55:13: RADIUS: Vendor, Cisco [26] 38
04:55:13: RADIUS: h323-remote-address[23] 32 "h323-remote-address=10.0.0.110"
04:55:13: RADIUS: Vendor, Cisco [26] 24
04:55:13: RADIUS: Cisco AVpair [1] 18 "release-source=1"
04:55:13: RADIUS: Vendor, Cisco [26] 29
04:55:13: RADIUS: h323-voice-quality [31] 23 "h323-voice-quality=-1"
04:55:13: RADIUS: Vendor, Cisco [26] 57
04:55:13: RADIUS: Cisco AVpair [1] 51 "alert-timepoint=*16:22:31.030 UTC Thu Feb 13 20
04:55:13: RADIUS: Vendor, Cisco [26] 39
04:55:13: RADIUS: Cisco AVpair [1] 33 "remote-media-address=10.0.0.110"
04:55:13: RADIUS: Vendor, Cisco [26] 44
04:55:13: RADIUS: Cisco AVpair [1] 38 "gw-final-xlated-cdn=ton:0,npi:0,#:11"
04:55:13: RADIUS: Vendor, Cisco [26] 44
04:55:13: RADIUS: Cisco AVpair [1] 38 "gw-final-xlated-cgn=ton:0,npi:1,#:22"
04:55:13: RADIUS: User-Name [1] 4 "22"
04:55:13: RADIUS: Acct-Status-Type [40] 6 Stop [2]
04:55:13: RADIUS: Calling-Station-Id [31] 4 "22"
04:55:13: RADIUS: Called-Station-Id [30] 4 "11"
```

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```

04:55:13: RADIUS: Service-Type [6] 6 Login [1]
04:55:13: RADIUS: NAS-IP-Address [4] 6 10.6.43.101
04:55:13: RADIUS: Acct-Delay-Time [41] 6 0
04:55:13: RADIUS(00000019): Using existing nas_port 0
04:55:13: RADIUS(00000019):Config NAS IP: 0.0.0.0
04:55:13: RADIUS(00000019):sending
04:55:13: RADIUS/ENCODE: Best Local IP-Address 1.6.43.101 for Radius-Server 10.6.10.203
04:55:13: RADIUS(00000019): Send Accounting-Request to 10.6.10.203:1646 id 21645/56,len766
04:55:13: RADIUS: authenticator 61 60 EB 92 29 5C DE B4 - CE 40 1C AB E3 A1 C8 F7
04:55:13: RADIUS: Acct-Session-Id [44] 10 "00000020"
04:55:13: RADIUS: Vendor, Cisco [26] 57
04:55:13: RADIUS: h323-setup-time [25] 51 "h323-setup-time=*16:22:30.994 UTC Thu Feb 13 20
04:55:13: RADIUS: Vendor, Cisco [26] 27
04:55:13: RADIUS: h323-gw-id [33] 21 "h323-gw-id=5400-GW."
04:55:13: RADIUS: Vendor, Cisco [26] 56
04:55:13: RADIUS: Conf-Id [24] 50 "h323-conf-id=2F4ED2E3 3EA611D7 800E0002 B935C14
04:55:13: RADIUS: Vendor, Cisco [26] 31
04:55:13: RADIUS: h323-call-origin [26] 25 "h323-call-origin=answer"
04:55:13: RADIUS: Vendor, Cisco [26] 32
04:55:13: RADIUS: h323-call-type [27] 26 "h323-call-type=Telephony"
04:55:13: RADIUS: Vendor, Cisco [26] 65
04:55:13: RADIUS: Cisco AVpair [1] 59 "h323-incoming-conf-id=2F4ED2E3 3EA611D7 800E000
04:55:13: RADIUS: Vendor, Cisco [26] 30
04:55:13: RADIUS: Cisco AVpair [1] 24 "subscriber=RegularLine"
04:55:13: RADIUS: Vendor, Cisco [26] 35
04:55:13: RADIUS: Cisco AVpair [1] 29 "gw-rxd-cdn=ton:0,npi:0,#:11"
04:55:13: RADIUS: Vendor, Cisco [26] 32
04:55:13: RADIUS: Cisco AVpair [1] 26 "calling-party-category=9"
04:55:13: RADIUS: Vendor, Cisco [26] 33
04:55:13: RADIUS: Cisco AVpair [1] 27 "transmission-medium-req=0"
04:55:13: RADIUS: Vendor, Cisco [26] 59
04:55:13: RADIUS: h323-connect-time [28] 53 "h323-connect-time=*16:22:31.046 UTC Thu Feb 13
04:55:13: RADIUS: Acct-Input-Octets [42] 6 81
04:55:13: RADIUS: Acct-Output-Octets [43] 6 2241
04:55:13: RADIUS: Acct-Input-Packets [47] 6 5
04:55:13: RADIUS: Acct-Output-Packets [48] 6 113
04:55:13: RADIUS: Acct-Session-Time [46] 6 5
04:55:13: RADIUS: Vendor, Cisco [26] 62
04:55:13: RADIUS: h323-disconnect-tim[29] 56 "h323-disconnect-time=*16:22:36.064 UTC Thu Feb
04:55:13: RADIUS: Vendor, Cisco [26] 32
04:55:13: RADIUS: h323-disconnect-cau[30] 26 "h323-disconnect-cause=10"
04:55:13: RADIUS: Vendor, Cisco [26] 35
04:55:13: RADIUS: Cisco AVpair [1] 29 "h323-ivr-out=Tariff:Unknown"
04:55:13: RADIUS: Vendor, Cisco [26] 24
04:55:13: RADIUS: Cisco AVpair [1] 18 "release-source=1"
04:55:13: RADIUS: Vendor, Cisco [26] 28
04:55:13: RADIUS: h323-voice-quality [31] 22 "h323-voice-quality=0"
04:55:13: RADIUS: User-Name [1] 4 "22"
04:55:13: RADIUS: Acct-Status-Type [40] 6 Stop [2]
04:55:13: RADIUS: NAS-Port-Type [61] 6 Async [0]
04:55:13: RADIUS: Vendor, Cisco [26] 20
04:55:13: RADIUS: cisco-nas-port [2] 14 "ISDN 6/0:D:1"
04:55:13: RADIUS: NAS-Port [5] 6 0
04:55:13: RADIUS: Calling-Station-Id [31] 4 "22"
04:55:13: RADIUS: Called-Station-Id [30] 4 "11"
04:55:13: RADIUS: Service-Type [6] 6 Login [1]
04:55:13: RADIUS: NAS-IP-Addres [4] 6 10.6.43.101
04:55:13: RADIUS: Acct-Delay-Time [41] 6 0
04:55:14: RADIUS: no sg in radius-timers: ctx 0x65BAB070 sg 0x0000
04:55:14: RADIUS: Retransmit to (10.6.10.203:1645,1646) for id 21645/55
04:55:14: RADIUS: acct-delay-time for 40553934 (at 40553CA3) now 1
04:55:14: RADIUS: no sg in radius-timers: ctx 0x65BA8284 sg 0x0000
04:55:14: RADIUS: Retransmit to (10.6.10.203:1645,1646) for id 21645/56
04:55:14: RADIUS: acct-delay-time for 405546C4 (at 405549BC) now 1

```

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```
04:55:15: RADIUS: no sg in radius-timers: ctx 0x65BAB070 sg 0x0000
04:55:15: RADIUS: Fail-over to (10.8.159.105:1645,1645) for id 21645/57
04:55:15: RADIUS: acct-delay-time for 40553934 (at 40553CA3) now 2
04:55:15: RADIUS/ENCODE: Best Local IP-Address 10.6.43.101 for Radius-Server 10.8.159.105
04:55:15: RADIUS: no sg in radius-timers: ctx 0x65BA8284 sg 0x0000
04:55:15: RADIUS: Fail-over to (10.8.159.105:1645,1645) for id 21645/58
04:55:15: RADIUS: acct-delay-time for 405546C4 (at 405549BC) now 2
04:55:15: RADIUS/ENCODE: Best Local IP-Address 10.6.43.101 for Radius-Server 10.8.159.105
04:55:15: RADIUS: Received from id 21645/59 10.8.159.105:1645, Accounting-response, len 20
04:55:15: RADIUS: authenticator B1 C4 5E FC DB FA 74 A4 - 05 E2 34 52 1A 11 26 06
04:55:15: vstats_acct_rsp_handler: methodlist=h323, rsp_type=0x4
04:55:15: acct_rsp_status=1 callid= 26, incoming=0, leg=2
04:55:15: vstats_acct_rsp_handler: increment since-reset counter
04:55:15: vstats_acct_rsp_handler: increment interval counter
04:55:15: RADIUS: Received from id 21645/60 10.8.159.105:1645, Accounting-response, len 20
04:55:15: RADIUS: authenticator 0E 70 74 2F E5 D8 EE 98 - B9 C0 DA 66 74 ED 84 77
04:55:15: vstats_acct_rsp_handler: methodlist=h323, rsp_type=0x4
04:55:15: acct_rsp_status=1 callid= 25, incoming=1, leg=1
04:55:15: vstats_acct_rsp_handler: increment since-reset counter
04:55:15: vstats_acct_rsp_handler: increment interval counter
```

Using Cause Code Statistics

By examining disconnect cause codes, you can understand the distribution of the various cause codes on the voice ports, trunk groups, and gateway, and which can help you determine why the voice calls were disconnected.

The call disconnection cause values are taken from International Telecommunication Union Telecommunication Standardization Sector (ITU-T) standard Q.931 and are as follows:

- Private Network-Network Interface (PNNI) references ITU-T standard Q.2931 for the information element (IE) causes.
- PNNI R15 6.3.6.3 contains the "crankback" causes.
- ITU-T standard Q.2931 references ITU-T standard Q.2610.
- ITU-T standard Q.2610 lists a few cause codes and references ITU-T standard Q.850.
- ITU-T standard Q.850 lists the bulk of the cause codes.

For specific information on the call disconnection cause values, see the [>Cause Codes and Debug Values](#).

Prerequisites

CSR configurations must be enabled before you can examine the voice calls that are made through the gateway.

Restrictions

Statistics of non-DID calls are not consistent with those of the underlying ISDN module.

SUMMARY STEPS

1. **enable**
2. **show voice statistics csr since-reset aggregation-level all**

DETAILED STEPS

	Command or Action	Purpose
1.	enable Example: <pre>Router> enable</pre>	Enables privileged EXEC mode. • Enter your password if prompted.
2.	show voice statistics csr since-reset aggregation-level all Example: <pre>Router# show voice statistics csr since-reset aggregation-level all</pre>	Displays all aggregation-level statistics since the last system reset or reboot.

Example

The following sample output shows cause-code statistics since the last reset for all aggregation levels.

```
Router# show voice statistics csr since-reset aggregation-level all
Client Type: VCSR
      Start Time: 1993-03-01T00:03:15Z          End Time: 1993-03-03T22:02:18Z
record_type=gw,trunk_group_id=,voice_port_id=,in_call=26,in_ans=16,in_fail=10,
out_call=26,out_ans=16,out_fail=10,in_szre_d=387,out_szre_d=380,in_conn_d=330,
out_conn_d=323, orig_disconn=0,in_ans_abnorm=0,out_ans_abnorm=0,in_mcd=0,
out_mcd=0,in_pdd=2340,out_pdd=12340,in_setup_delay=2340,out_setup_delay=3340,
lost_pkt=0,latency=0,jitter=0, in_disc_cc_16=16,in_disc_cc_18=2,in_disc_cc_19=3,
in_disc_cc_34=5,out_disc_cc_16=16, out_disc_cc_18=2,out_disc_cc_19=3,out_disc_cc_34=5
!
record_type=ip,trunk_group_id=,voice_port_id=,in_call=26,in_ans=16,in_fail=10,out_call=0,
out_ans=0,out_fail=0,in_szre_d=387,out_szre_d=0,in_conn_d=330,out_conn_d=0,
orig_disconn=0,in_ans_abnorm=0,out_ans_abnorm=0,in_mcd=0,out_mcd=0,in_pdd=2340,
out_pdd=0,in_setup_delay=2340,out_setup_delay=0,lost_pkt=20,latency=15,
jitter=10,in_disc_cc_16=16, in_disc_cc_18=2,in_disc_cc_19=3,in_disc_cc_34=5,
out_disc_cc_16=3
!
```

Table: Significant Fields of the show voice statistics csr since-reset aggregation-level all Command shows two types of cause codes listed in the output above.

Table: Significant Fields of the show voice statistics csr since-reset aggregation-level all Command

Field	Description
in_disc_cc_16=16	Count of incoming calls that are disconnected with a specific cause code number. In this example, the value 16 indicates normal call clearing
out_disc_cc_16=3	Count of outgoing calls that are disconnected with a specific cause code number.

Displaying Quality of Service Indicators

The quality of service (QoS) indicators per voice call are the results of transmitting and receiving voice packets in the IP interface. These results are included in the CSRs and are as follows:

- Lost packet value: the number of calls losing more than the configured number of packets. The default lost packet threshold is 1000 milliseconds.
- Packet latency value: the number of calls with voice packets encountering more than the configured amount of latency. The default packet latency threshold is 250 milliseconds.

- Packet jitter value: the number of calls with voice packets encountering more than the configured amount of jitter. The default packet jitter threshold is 250 milliseconds.

Before you can determine that any voice call with IP voice packets is deviating from the desired level of quality, you must configure the threshold values of lost packets, latency, and jitter. See the following sections:

- [Configuring the Minimum Call Duration and Signaling Thresholds](#)
- [Displaying Memory Usage](#)

Restrictions

Call statistics for MGCP calls are not guaranteed to be correct and accurate. In addition, statistics of non-DID ISDN calls are not consistent with those of the underlying ISDN module.

SUMMARY STEPS

1. **enable**
2. **show voice statistics csr since-reset aggregation-level all**

DETAILED STEPS

	Command or Action	Purpose
1.	<p>enable</p> <p>Example:</p> <pre>Router> enable</pre>	<p>Enables privileged EXEC mode.</p> <ul style="list-style-type: none"> • Enter your password if prompted.
2.	<p>show voice statistics csr since-reset aggregation-level all</p> <p>Example:</p> <pre>Router# show voice statistics csr since-reset aggregation-level all</pre>	<p>Displays the voice statistics of the voice calls made through the gateway.</p>

Example

The following sample output displays lost packet, latency, and jitter QoS information:

```
Router# show voice statistics csr since-reset aggregation-level all
Client Type: VCSR
      Start Time: 1993-03-01T00:03:15Z      End Time: 1993-03-03T22:02:18Z
record_type=gw,trunk_group_id=,voice_port_id=,in_call=26,in_ans=16,in_fail=10,
out_call=26,out_ans=16,out_fail=10,in_szre_d=387,out_szre_d=380,in_conn_d=330,
out_conn_d=323, orig_disconn=0,in_ans_abnorm=0,out_ans_abnorm=0,in_mcd=0,
out_mcd=0,in_pdd=2340, out_pdd=12340,in_setup_delay=2340,out_setup_delay=3340,
lost_pkt=10,latency=3,jitter=5,in_disc_cc_16=16,in_disc_cc_18=2,in_disc_cc_19=3,
in_disc_cc_34=5,out_disc_cc_16=16, out_disc_cc_18=2,out_disc_cc_19=3,out_disc_cc_34=5
!
record_type=ip,trunk_group_id=,voice_port_id=,in_call=26,in_ans=16,in_fail=10,out_call=0,
out_ans=0,out_fail=0,in_szre_d=387,out_szre_d=0,in_conn_d=330,out_conn_d=0,
```


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```
orig_disconn=0,in_ans_abnorm=0,out_ans_abnorm=0,in_mcd=0,out_mcd=0,in_pdd=2340,  
out_pdd=0, in_setup_delay=2340,out_setup_delay=0,lost_pkt=10,jitter=5,  
in_disc_cc_16=16, in_disc_cc_18=2,in_disc_cc_19=3,in_disc_cc_34=5,out_disc_cc_16=0  
!
```