Oracle® Communications Session Border Controller

HDR Resource Guide

Release S-CX6.3.0

Formerly Net-Net Session Director

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About this Guide

Introduction

The *Oracle Communications Session Border Controller HDR Resource Guide* provides information about Historical Data Recording (HDR) for S-C Series products. This document includes the following information:

- Description of HDR and how it works
- Enabling/disabling HDR
- Starting, stopping, restarting, purging, and requesting HDR status using the Acme Command Line Interface (ACLI)
- Using a Push Receiver to push the data to a server
- HDR Groups and Group Statistics
- "Show" commands associated with the HDR Groups and Group Statistics

Supported Platforms

Release Release S-CX6.3.0 is supported on the Acme Packet 4500 and Acme Packet 3800 series platforms.

Related Documentation

The following table lists the members that comprise the documentation set for this release:

Document Name	Document Description
Acme Packet 4500 System Hardware Installation Guide	Contains information about the components and installation of the Acme Packet 4500 system.
Acme Packet 3800 Hardware Installation Guide	Contains information about the components and installation of the Acme Packet 3800 system.
Release Notes	Contains information about the current documentation set release, including new features and management changes.
ACLI Configuration Guide	Contains information about the administration and software configuration SBC.
ACLI Reference Guide	Contains explanations of how to use the ACLI, as an alphabetical listings and descriptions of all ACLI commands and configuration parameters.
Maintenance and Troubleshooting Guide	Contains information about SBC logs, performance announcements, system management, inventory management, upgrades, working with configurations, and managing backups and archives.

Document Name	Document Description
MIB Reference Guide	Contains information about Management Information Base (MIBs), Enterprise MIBs, general trap information, including specific details about standard traps and enterprise traps, Simple Network Management Protocol (SNMP) GET query information (including standard and enterprise SNMP GET query names, object identifier names and numbers, and descriptions), examples of scalar and table objects.
Accounting Guide	Contains information about the SBC's accounting support, including details about RADIUS accounting.
HDR Resource Guide	Contains information about the SBC's Historical Data Recording (HDR) feature. This guide includes HDR configuration and system-wide statistical information.
Administrative Security Essentials	Contains information about the SBC's support for its Administrative Security license.

Revision History

This section contains a revision history for this document.

Date	Revision Number	Description
April 30, 2012	Revision 1.00	• Initial Release
July 27, 2012	Revision 1.10	• Corrects the definition of "show sipd sessions" to reflect that the data shown when using this command is the sum of INVITEs and SUBSCRIBEs (and not INVITEs only)
March 6, 2013	Revision 1.11	• Fixed a bug in the "show sipd sessions" graphic.
September 9, 2013	Revision 1.12	• Added outputs of "Local Contacts", "HNT Entries", and "Non-HN Entries" in the "" command.
May 26, 2014	Revision 1.13	• Adds public key configuration procedure. • Improves description for Average one way signlaing latency and Maximum one way signaling latency objects. • Fixes capitalization error presented in the I2C Bus State variable description. • Adds caveats on data within CSVs. • Added missing Current Deny Entries Allocated data field to system group. • Added missing Total Subscriptions data field to session-realm group. • Added missing Call Rejects data field to sip-errors group. • Corrects data type and range for sip-status' session rate variable. • Corrects data type and range for sip-status' load rate variable. • Adds note indicating that transaction timeout statistics are not valid for server operations. • Adds note indicating that locally throttled statistics are not valid for server operations.

Contents

1 Overview

Introduction

This section provides an overview of Historical Data Recording (HDR) and how it works on the Net-Net C-Series products. It also provides information about enabling and disabling HDR on the Net-Net SD.

What is HDR?

Historical data recording (HDR) refers to a group of management features that allow you to configure the Net-Net SD to collect statistics about system operation and function, and then send those records to designated servers. System statistics, defined in detail below, are saved to a comma-separated value (CSV) file, which are then sent to the designated server(s).

Information types are grouped so that you can refer to a set of statistics by simply invoking their group name (For example, the system statistics are in a group called **System**; interface statistics are in a group called **Interface**; etc.). Within each group, there are several metrics available.

The following table describes the type of HDR statistics that the Net-Net SD can collect and forward to a designated server.

HDR Statistics	Description
Group Name	The name of the group that contains the HDR statistics. This name is similar to the current Net-Net SD ACLI parameters. For example, “system”, “interface”, “session-agent”, “session-realm”, etc. The SBC uses the group name when generating the “.CSV” file (for example, *system.csv*, *interface.csv*, etc.).
Group Statistics	Various statistical parameters within a group. These statistical parameters appear in the first record of the header in each “.CSV” file (for example, in the *system.csv* file, the header would include the statistic headings of CPU Utilization, Memory Utilization, Health Score, etc.).
Type	Type of statistical parameter. This document makes use of the following data types: • **counter** - A counter is an integer with a minimum possible value of 0 and a maximum value of $2^{32} - 1$. A counter is always increasing in value or remaining unchanged. It decreases only in response to reaching its maximum possible value, at which point it’s next value (when the next counted entity or event occurs) will be 0. • **gauge** - A gauge is an integer with the same bounds as a counter. However, it does not always have an increasing value. Its value may go up or down. • **period** - A period type represents a value determined as the sum of a number of events which occurred during a specified “window of time”, or stated alternatively, “a time period”. There are three windows defined, the "current window", the "previous window", and the "sliding window". For more information about these “windows”, see Windows of Time (40). • **config** - For the config type, the value for this field comes from a configuration record. • **timeticks** - For the timeticks type, each tick is 1/100th of a second. • **string** - A statistic type pertains to statistics that display as an alpha-numeric character string.

HDR Statistics	Description
Timer Value (seconds)	For period statistics (statistics that use a period timer), this is the default value, in seconds, of the timer. This value is usually not configurable. However, this value may fall within a range of values if applicable.
Range	The range of values that a group statistic may use when the SBC collects statistics.

For descriptions of specific HDR Statistics and values, see HDR Groups and Group Statistics (39).

Enabling/Disabling HDR

In the system configuration, you can enable HDR by first turning on the system's collection function, then choosing the records you want to capture, and finally setting up server(s) to which you want records sent.

The main collect configuration (found within the main system configuration) allows you to create global settings that:

- Enable or disable HDR at boot time
- Set the sample rate in seconds, or the time between sample individual collections
- Set the time, in seconds, between individual pushes to designated servers (configured in the push receiver configuration accessed via the collect configuration)
- Set the time you want the collect to start and stop; time is entered in year, month, day, hours, minutes, and seconds

You also configure settings for each group of data you want to collect, and the push receiver (server) to which you want data sent.

For more information about configuring HDR on the Net-Net SD, see Configuring HDR (21).

Protocol Use

You can configure HDR to send files using File Transfer Protocol (FTP) or Secure File Transfer Protocol (SFTP) for added security. FTP is the default.

> **Note:** Public key authentication is not available when you choose SFTP. Instead, the Net-Net SD uses password authentication. However, for SFTP to work, it is still required that you load the SFTP's host public key on the Net-Net SD.

About the CSV File

When HDR is enabled, statistical records are forwarded from the Net-Net SD to push servers that send the data (in standard format) to a receiving server for viewing in a comma-separated value (CSV) file on the server. Before pushing a file, the collector creates the directory by group name for which the statistic belongs (for example, *fan*, *sip-client*, *system*, etc.), if the directory does not exist from a previous push.

The collector can push multiple CSV files per directory. Each file is formatted as <*Unix timestamp*>.*csv* (for example, *1302041977.csv*). The first record of each file is a header containing the attribute name. For example, in the "*System*" directory, a file

name of "*13020441977.csv*" can contain the header names of CPU Utilization, Memory Utilization, Health Score, Redundancy State, etc. The collector appends a Timestamp heading attribute to the beginning of every record as well. You can open the CSV file for viewing with any application that reads a CSV file format. For more information about the CSV file, see HDR Data (39).

> **Note:** The records in a CSV file may display differently, depending on the record data included in the file, and the method used to open the file. For more information about the display of record data in a CSV file, see Appendix A, CSV File Data Formats (171).

Collection Interval and Push

In your HDR configuration, you can set parameters that allow you to:

- Select the groups for record collection
- Set the frequency of record collection
- Set the frequency of off-box record collection

After configuring and enabling HDR, the Net-Net SD forwards group records to push servers that send the data to a receiving server. The number of records in a push equals the push interval divided by the sample interval time multiplied by the number of groups, plus one:

push interval ÷ sample interval time x number of groups +1 header record per group = number of records in a push

For example, if you set a push interval time of 60 minutes and a sample interval time of 5 minutes, with 10 groups, the Net-Net SD would send 120 group records plus 10 header records (for a total of 130 records) for each push:

[(60 ÷ 5) x 10] +10 = 130

You can configure an option parameter (disabled by default) that instructs the Net-Net SD to send a trap when data has been successfully pushed. This trap is defined in the `ap-smgmt.mib`. It contains the name of the node that successfully pushed the HDR file to an HDR server, a unique file name for the HDR file that was pushed, and the IP address of the push receiver (configured in the global collection configuration). For more information about the HDR SNMP traps, see the product-specific *Net-Net SD MIB Reference Guide*.

> **Note:** After each push, the Net-Net SD clears (deletes) all records. The Net-Net SD also clears files on system reboot, and after three consecutive push failures.

2 Configuring HDR

Introduction

This section provides information and procedures for configuring HDR on the Net-Net C-Series products. It also includes procedures for starting and stopping the collection of data at the Acme Packet Command Line Interface (ACLI).

Configuring HDR via the ACLI

This section provides procedures for configuring HDR. HDR configuration includes:

- setting parameters to govern sample and push intervals, and start/end times for collection
- setting parameters to support HDR across a high availability (HA) node
- setting group parameters to inform the Net-Net Session Border Controller (SBC), which groups of records to collect, when to start and stop collecting, and how often to sample for a specific group.
- setting push receivers that transport the records forwarded by the Net-Net SD

Note: If you modify the HDR configuration parameters using the ACLI, the changed parameters DO NOT take affect until you reboot the SD.

Enabling HDR Collection

You access the parameters that enable and support HDR using the ACLI **system-config** path.

To enable HDR collection:

1. In Superuser mode, type **configure terminal** and press <Enter>.

   ```
   ACMEPACKET# configure terminal
   ```

2. Type **system** and press <Enter>.

   ```
   ACMEPACKET(configure)# system
   ACMEPACKET(system)#
   ```

3. Type **system-config** and press <Enter>.

   ```
   ACMEPACKET(system)# system-config
   ACMEPACKET(system-config)#
   ```

4. Enter **collect** and press <Enter>. From here, you can type a question mark (?) to see individual parameters for the configuration.

   ```
   ACMEPACKET(system-config)# collect
   ACMEPACKET(collect)#
   ```

Setting Global Collection

You access the collection configuration through the ACLI system-configuration menu. Once in the collection configuration, you can establish the global settings for HDR collection.

To set HDR global collection:

1. In Superuser mode, navigate to the "collect" parameter level in the ACLI.

```
ACMEPACKET# configure terminal
ACMEPACKET(configure)# system
ACMEPACKET(system)# system-config
ACMEPACKET(system-config)# collect
ACMEPACKET(collect)#
```

2. Set global collection parameters as applicable. Parameters include:
   - **sample-interval**—Enter the time in minutes for how often you want the Net-Net SD to sample data records. The default is **5**. The valid range is:
     - Minimum—1
     - Maximum—120
   - **push-interval**—Enter the time in minutes for how often you want the Net-Net SD to send collected records to push receiver(s). The default is **15**. The valid range is:
     - Minimum—1
     - Maximum—120
   - **boot-state**—Set this parameter to **enabled** to start group collection, or to **disabled** to prevent the Net-Net SD from collecting HDR statistics. This parameter does not go into effect until the system is rebooted. You can also use the ACLI request collect start command to start collection; using this command, you can start collection for all groups, or for one specified group. The default is **disabled**. Valid values are:
     - enabled | disabled
   - **start-time**—Enter the exact date and time (for your local timezone) when you want the Net-Net SD to start HDR collection. You can enter **now** to set the start-time to the current time, or you can specify a time in the future. If you specify a time, it must be in the format `yyyy-mm-dd-hh:mm:ss`, where: `yyyy` is the year, `mm` is the month, `dd` is the day, `hh` in the hour, `mm` is the minutes, and `ss` is the second (24-hour clock). The default is **now**.
   - **end-time**—Enter the exact date and time (for your local timezone) when you want the Net-Net SD to finish HDR collection. You can enter **never** to set the time to never end, or you can specify an end time in the future. If you specify a time, it must be in the format `yyyy-mm-dd-hh:mm:ss`, where: `yyyy` is the year, `mm` is the month, `dd` is the day, `hh` in the hour, `mm` is the minutes, and `ss` is the second (24-hour clock). The default is **never**.
   - **push-success-trap-state**—Set this parameter to **enabled** if you want the Net-Net SD to send a trap confirming successful data pushes to HDR servers. Default is **disabled**. Valid values are:
     - enabled | disabled

Setting HDR for an HA Node

If you are using the HDR feature on a High Availability (HA) node (or redundant pair of Net-Net SDs), several parameters in the collection configuration must be set for HDR to perform properly.

Acme Packet recommends strongly that you do not change these parameters from their defaults for a normal HA node configuration. Therefore, if you need to change them to support HDR, you should do so with caution.

To set HDR support across an HA node:

1. In Superuser mode, navigate to the "**collect**" parameter level in the ACLI.

```
ACMEPACKET# configure terminal
ACMEPACKET(configure)# system
ACMEPACKET(system)# system-config
ACMEPACKET(system-config)# collect
ACMEPACKET(collect)#
```

2. Set HDR collection parameters for an HA node as applicable. Parameters include:
   - **red-collect-state**—Set the state of HA support for the collector function. The default is **disabled**. Valid values are:
     - enabled | disabled
   - **red-max-trans**—Enter the maximum number of HA synchronized transactions to maintain on the active system in the HA node. The default is **1000**. The valid range is:
     - Minimum—0
     - Maximum—999999999
   - **red-sync-start-time**—Enter the amount of time, in milliseconds, that the active Net-Net SD checks to confirm that it is still the active system in the HA node. If the active system is still adequately healthy, this timer resets itself. If for any reason the active has become the standby, it starts to checkpoint with the newly active system when this timer expires. The default is **5000**. The valid range is:
     - Minimum—0
     - Maximum—999999999
   - **red-sync-comp-time**—Enter amount of time, in milliseconds, that determines how frequently after synchronization the standby Net-Net SD checkpoints with the active Net-Net SD. The first interval occurs after initial synchronizations of the systems; this is the timeout for subsequent synchronization requests. The default is **1000**. The valid range is:
     - Minimum—0
     - Maximum—999999999

Setting Multiple Collection Groups

You can configure the Net-Net SD to collect multiple groups of statistics. Collection group settings are accessible through the collection configuration. For specific group names, group statistics, and values, see HDR Groups and Group Statistics (39).

The "sample-interval", "start-time", and "end-time" parameters that you set for multiple collection groups override the same parameters set for global collection.

> **Note:** For multiple collection groups, the "sample-interval" value must always be smaller than the global collection parameter value for "push-interval".

To set multiple collection groups:

1. In Superuser mode, navigate to the "collect" parameter level in the ACLI.

```
ACMEPACKET# configure terminal
ACMEPACKET(configure)# system
ACMEPACKET(system)# system-config
ACMEPACKET(system-config)# collect
ACMEPACKET(collect)#
```

2. Access the collection group (**group-settings**) parameters.

```
ACMEPACKET(collect)# group-settings
ACMEPACKET(group-settings)#
```

3. Set the group parameters for multiple collection groups as applicable. Parameters include:

   - **group-name**—Enter the group name corresponding to the records that you want to collect; there are 25 possible groups for which the Net-Net SD can collect data. The **system** group name is the default for this parameter. For additional group names, see HDR Groups and Group Statistics (39).
   - **sample-interval**—Enter the time in minutes for how often you want the Net-Net SD to sample data records for the specified group. The default is **5**. The valid range is:
     - Minimum—1
     - Maximum—120
   - **boot-state**—Set this parameter to **enabled** to start group collection, or to **disabled** to prevent the Net-Net SD from collecting HDR statistics for this group. This parameter does not go into effect until the system is rebooted. You can also use the ACLI request collect start command to start collection; using this command, you can start collection for all groups, or for one specified group. The default is **disabled**. Valid values are:
     - enabled | disabled
   - **start-time**—Enter the exact date and time (for your local timezone) when you want the Net-Net SD to start collecting records for this group. You can enter **now** to set the start-time to the current time, or you can specify a time in the future. If you specify a time, it must be in the format `yyyy-mm-dd-hh:mm:ss`, where: `yyyy` is the year, `mm` is the month, `dd` is the day, `hh` in the hour, `mm` is the minutes, and `ss` is the second (24-hour clock). The default is **now**.

- **end-time**—Enter the exact date and time (for your local timezone) when you want the Net-Net SD to stop collecting records for this group. You can enter **never** to set the time to never end, or you can specify an end time in the future. If you specify a time, it must be in the format `yyyy-mm-dd-hh:mm:ss`, where: `yyyy` is the year, `mm` is the month, `dd` is the day, `hh` in the hour, `mm` is the minutes, and `ss` is the second (24-hour clock). The default is **never**.

Setting Servers as Push Receivers

You can configure multiple push receivers that represent FTP or SFTP destination servers for which the Net-Net SD pushes records. Push receiver settings are accessible through the collection configuration.

If you configure more than one server, the Net-Net SD sends data to all of the servers. If one server fails, the Net-Net SD generates an SNMP trap. The Net-Net SD makes 3 attempts to send data to the failed server. If the server cannot receive the data, the Net-Net SD clears the data for that server. For example, if there are four servers configured, and the Net-Net SD successfully pushes data to three of them, the Net-Net SD generates a trap indicating the fourth server is down and after 3 attempts to send the data, the data is cleared.

To set servers as push receivers:

1. In Superuser mode, navigate to the "collect" parameter level in the ACLI.

   ```
   ACMEPACKET# configure terminal
   ACMEPACKET(configure)# system
   ACMEPACKET(system)# system-config
   ACMEPACKET(system-config)# collect
   ACMEPACKET(collect)#
   ```

2. Access the push receiver (**push-receiver**) parameters.

   ```
   ACMEPACKET(collect)# push-receiver
   ACMEPACKET(push-receiver)#
   ```

   - **address**—Enter the IP address of the push receiver (server) to which you want records sent. The default for this parameter is **0.0.0.0**.
   - **username**—Enter the username that the Net-Net SD uses when it tries to send records to this push server using FTP. There is no default for this parameter.
   - **password**—Enter the password (corresponding to the username) that the Net-Net SD uses when it sends records to this push server using FTP. There is no default for this parameter. Enter this password parameter using the following procedure:

     a. Type the parameter name **password**, and then press <Enter>.

        ```
        ACMEPACKET(push-receiver)# password
        ```

     b. Enter the password that the Net-Net SD uses to send records to the push server. The display does not echo the password you enter.

        ```
        Enter password: [enter the password]
        ```

c. Enter the password again to confirm that you entered the password correctly. If the passwords match, the user prompt displays to continue the push server configuration.

```
Enter password again: [enter the password again]
ACMEPACKET(push-receiver)#
```

If the passwords do not match, an error message displays. Repeat Steps **a** through **c** to set the password.

```
Error:  Password mismatch - aborted.
ACMEPACKET(push-receiver)#
```

- **data-store**—Enter the directory on the push receiver where you want collected data placed. There is no default for this parameter.
- **protocol**—Set this parameter to the protocol with which to send HDR collection record files. Default is **FTP**. Valid values are:
  - FTP | SFTP

Note: Public key authentication is not available when you choose SFTP. Instead, the Net-Net SD uses password authentication. However, for SFTP to work, it is still required that you load the SFTP's host public key on the Net-Net SD.

Creating a Public Key Profile

The Secure Shell (SSH) and related Secure Shell File Transfer (SFTP) protocols provide for the secure transfer of audit files and for the secure transfer of management traffic across the *wancom0* interface. When using password or public key authentication with push receiver configurations, use the procedures described below to create your profiles.

Create your profile by configuring:

- SSH Properties
- Import an SSH Host Key
- Create the public key profile

The following two tasks are required for public key authentication mode only.

- Generate an SSH Key Pair
- Copy the Net-Net SD public Key to the SFTP server

After the above, you can use this profile within the context of your FTP push configuration.

SSH Operations

SSH Version 2.0, the only version supported on the Acme Packet Net-Net SBC, is defined by a series of five RFCs.

- RFC 4250, *The Secure Shell (SSH) Protocol Assigned Numbers*
- RFC 4251, *The Secure Shell (SSH) Protocol Architecture*
- RFC 4252, *The Secure Shell (SSH) Authentication Protocol*
- RFC 4253, *The Secure Shell (SSH) Transport Layer Protocol*
- RFC 4254, *The Secure Shell (SSH) Connection Protocol*

RFCs 4252 and 4253 are most relevant to SBC operations.

The transport layer protocol (RFC 4253) provides algorithm negotiation and key exchange. The key exchange includes server authentication and results in a cryptographically secured connection that provides integrity, confidentiality and

optional compression. Forward security is provided through a Diffie-Hellman key agreement. This key agreement results in a shared session key. The rest of the session is encrypted using a symmetric cipher, currently 128-bitAES, Blowfish, 3DES, CAST128, Arcfour, 192-bit AES, or 256-bit AES. The client selects the encryption algorithm to use from those offered by the server. Additionally, session integrity is provided through a crypto-graphic message authentication code (hmac-md5, hmac-sha1, umac-64 or hmac-ripemd160).

The authentication protocol (RFC 4252) uses this secure connection provided and supported by the transport layer. It provides several mechanisms for user authentication. Two modes are supported by the Net-Net SD: traditional password authentication and public-key authentication.

ACLI Instructions and Examples

This section provides ACLI procedures for SFTP push configurations, including SSH property configuration, certificate import, and public key profile configuration on your Net-Net SD.

Configure SSH Properties

The single instance **ssh-config** configuration element specifies SSH re-keying thresholds.

1. From admin mode, use the following command path to access the ssh configuration element:

   ```
   ragnarok# configure terminal > security > admin-security >
   ssh-config
   ragnarok(ssh-config)#
   ```

ssh configuration element properties are shown below with their default values

```
rekey-interval            60
rekey-byte-count          31
```

2. **rekey-interval**—specifies the maximum allowed interval, in minutes, between SSH key negotiations

   Allowable values are integers within the range 60 through 600, with a default of 60 (minutes). Shorter lifetimes provide more secure connections.

   Works in conjunction with **rekey-byte-count**, which sets a packet-based threshold, to trigger an SSH renegotiation. If either trigger is activated, an SSH renegotiation is begun.

   Retain the default value, or specify a new value.

   ```
   ragnarok(ssh-config)# rekey-interval 20
   ragnarok(ssh-config)
   ```

3. **rekey-byte-count**—specifies the maximum allowed send and receive packet count, in powers of 2, between SSH key negotiations

   Allowable values are integers within the range 20 (1,048,576 packets) through 31 (2,147,483,648 packets), with a default of 31 (2^{31}). Smaller packet counts provide more secure connections.

   Works in conjunction with **rekey-interval**, which sets a time-based threshold, to trigger an SSH renegotiation. If either trigger is activated, an SSH renegotiation is begun.

   Retain the default value, or specify a new value.

   ```
   ragnarok(ssh-config)# rekey-packet-count 24
   ragnarok(ssh-config)
   ```

A sample SSH configuration appears below:

```
ragnarok(ssh-config)# rekey-interval 20
ragnarok(ssh-config)# done
ragnarok(ssh-config)# exit
ragnarok(admin-security)#
```

Specifies a key renegotiation every 20 minutes, or at the reception/transmission of 2,147,483,648 packets, whichever comes first.

Import an SSH host Key

Importing a host key requires access to the SFTP server or servers which receive audit log transfers. Access is generally most easily accomplished with a terminal emulation program such as PuTTY, SecureCRT, or TeraTerm.

1. Use a terminal emulation program to access the SSH file system on a configured SFTP server.
2. Copy the server's base64 encoded public file making sure in include the Begin and End markers as specified by RFC 4716, *The Secure Shell (SSH) Public Key File Format*.

   For OpenSSH implementations host files are generally found at */etc/ssh/ssh_host_dsa_key.pub*, or *etc/ssh/sss_host_rsa.pub*. Other SSH implementations can differ.
3. From admin mode use the **ssh-pub-key** command to import the host key to the SBC.

   For importing a host key, this command takes the format:

   `ssh-pub-key import known-host` <*name*>

   where *name* is an alias or handle assigned to the imported host key, generally the server name or a description of the server function.

   ```
   ragnarok# ssh-pub-key import known-host fedallah

   IMPORTANT:
           Please paste ssh public key in the format defined in rfc4716.
           Terminate the key with ";" to exit.......
   ```

4. Paste the public key with the bracketing Begin and End markers at the cursor point.
5. Enter a semi-colon (;) to signal the end of the imported host key.

6. Follow directions to save and activate the configuration.

   The entire import sequence is shown below.

```
ragnarok# ssh-pub-key import known-host fedallah
IMPORTANT:
        Please paste ssh public key in the format defined in rfc4716.
        Terminate the key with ";" to exit.......

---- BEGIN SSH2 PUBLIC KEY ----
Comment: "2048-bit RSA, converted from OpenSSH by klee@acme54"
AAAAB3NzaC1yc2EAAAABIwAAAQEA7OBf08jJe7MSMgerjDTgZpbPblrX4n17LQJgPC7clL
cDGEtKSiVt5MjcSav3v6AEN2pYZihOxd2ZzismpooO19kkJ56s/IjGstEzqXMKHKUr9mBV
qvqIEOTqbowEi5sz2AP31GUjQTCKZRF1XOQx8A44vHZCum93/jfNRsnWQ1mhHmaZMmT2LS
hOr4J/Nlp+vpsvpdrolV6Ftz5eiVfgocxrDrjNcVtsAMyLBpDdL6e9XebQzGSS92TPuKP/
yqzLJ2G5NVFhxdw5i+FvdHz1vBdvB5O5y2QPj/iz1u3TA/3O7tyntBOb7beDyIrg64Azc8
G7E3AGiH49LnBtlQf/aw==
---- END SSH2 PUBLIC KEY ----
 ;
 SSH public key imported successfully....
 WARNING: Configuration changed, run "save-config" command to save it
 and run "activate-config" to activate the changes
 ragnarok# save-config
 checking configuration
 ------------------------------------------------------------------------
 ...
 ...
 ...
 ------------------------------------------------------------------------
 Save-Config received, processing.
 waiting for request to finish
 Request to 'SAVE-CONFIG' has Finished,
 Save complete
 Currently active and saved configurations do not match!
 To sync & activate, run 'activate-config' or 'reboot activate'.
 ragnarok# activate-config
 Activate-Config received, processing.
 waiting for request to finish
 SD is not QOS-capable
 Request to 'ACTIVATE-CONFIG' has Finished,
 Activate Complete
 ragnarok#
```

It is important to note that it is often difficult to determine whether the server is using RSA or DSA keys for your application. Unless you can definitively determine this, bear in mind that you need to try importing both.

Create the Public Key Record

The initial step in generating an SSH key pair is to configure a public key record which will serve as a container for the generated key pair.

1. Navigate to the **public-key** configuration element.

```
ragnarok# configure terminal
ragnarok(configure)# security
ragnarok(security)# public-key
ragnarok(public-key)#
```

2. Use the **name** command to provide the object name, and the **show** command to verify object creation.

```
ragnarok(public-key)# name tashtego
ragnarok(public-key)# show
public-key
        name                          tashtego
        type                          rsa
        size                          1024
        last-modified-by
        last-modified-date
ragnarok(public-key)#
```

This command creates a public key record named *tashtego*.

3. Use the **done** command to complete object creation.

```
ragnarok(public-key)# done
public-key
        name                          tashtego
        type                          rsa
        size                          1024
        last-modified-by              admin@console
        last-modified-date            2009-03-06 11:18:00
ragnarok(public-key)#
```

4. Make a note of the **last-modified-date** time value.
5. Move back to admin mode, and save and activate the configuration.

```
ragnarok(public-key)# exit
ragnarok(security)# exit
ragnarok(configure)# exit
ragnarok#
ragnarok# save-config
...
...
...
ragnarok# activate-config
...
...
...
ragnarok#
```

Generate an SSH key pair

1. Now use the **ssh-pub-key generate** command, in conjunction with the name of the public key record created in Step 3, to generate an SSH key pair.

   For importing an SSH key pair, this command takes the format:

   `ssh-pub-key generate` <*name*>

   where *name* is an alias or handle assigned to the generated key pair, generally the client name or a description of the client function.

```
ragnarok# ssh-pub-key generate tashtego
Please wait...
public-key 'tashtego' (RFC 4716/SECSH format):

---- BEGIN SSH2 PUBLIC KEY ----
```

```
Comment: "1024-bit rsa"
AAAAB3NzaC1yc2EAAAABIwAAAIEArZEP1/WiYsdGd/Pi8V6pnSwV4cVG4U+jV
OwiSwNJCC9Nk82/FKYleLZevy9D3lrZ8ytvu+sCYy0fNk4nwvz2Oc2N+r86kD
ru88JkUqpelJDx1AR718Icpr7ZaAx2L+e7cpyRSXCgbQR7rXu2H3bp9Jc0VhR
2fmkclmrGAIr7Gnc=
---- END SSH2 PUBLIC KEY ----

SSH public-key pair generated successfully....

WARNING: Configuration changed, run "save-config" command to save it
and run "activate-config" to activate the changes
ragnarok#
```

2. Copy the base64-encoded public key. Copy only the actual public key — do not copy the bracketing Begin and End markers nor any comments. Shortly you will paste the public key to one or more SFTP servers.
3. Save and activate the configuration.

```
ragnarok# save-config
...
...
...
ragnarok# activate-config
...
...
...
```

4. Return to the public-key configuration object, and select the target public key record instance.

```
ragnarok# configure terminal
ragnarok(configure)# security
ragnarok(security)# public-key
ragnarok(public-key)# sel
<name>:
1: acme01
2: acme02
3: tashtego

selection: 3
ragnarok(public-key)# show
public-key
        name                            tashtego
        type                            rsa
        size                            1024
        last-modified-by                admin@console
        last-modified-date              2009-03-06 11:24:32
ragnarok(public-key)#
```

5. Verify that the record has been updated to reflect key generation by examining the value of the `last-modified-date` field.

Copy a client public key to an SFTP server.

Copying the client public key to an SFTP server requires server access generally using a terminal emulation program such as PuTTY, SecureCRT, or TeraTerm.

1. Use a terminal emulation program to access the SSH file system on a configured SFTP server.
2. Copy the client key to the SFTP server.

   On OpenSSH implementations, public keys are usually stored in the *~/.ssh/authorized_keys* file. Each line this file (1) is empty, (2) starts with a pound (#) character (indicating a comment), or (3) contains a single public key.

   Refer to the sshd man pages for additional information regarding file format.

   Use a text editor such as *vi* or *emacs* to open the file and paste the public key to the tail of the *authorized_keys* file.

For SSH implementations other than OpenSSH, consult the system administrator for file structure details.

View a Public key on the Net-Net SD

You can use the `show security ssh-pub-key` command to display information about SSH keys imported to the SBC with the `ssh-pub-key` command; you cannot display information about keys generated by the `ssh-pub-key` command.

```
ragnarok# show security ssh-pub-key brief
login-name:
    acme74
finger-print:
    51:2f:f1:dd:79:9e:64:85:6f:22:3d:fe:99:1f:c8:21
finger-print-raw:
    0a:ba:d8:ef:bb:b4:41:d0:dd:42:b0:6f:6b:50:97:31

login-name:
    fedallah
finger-print:
    c4:a0:eb:79:5b:19:01:f1:9c:50:b3:6a:6a:7c:63:d5
finger-print-raw:
    ac:27:58:14:a9:7e:83:fd:61:c0:5c:c8:ef:78:e0:9c
ragnarok#
```

This command displays summary information for all SSH imported keys.

login-name

contains the name assigned to the RSA or DSA public key when it was first imported

finger-print

contains the output of an MD5 hash computed across the base64-encoded public key

finger-print-raw

contains the output of an MD5 hash computed across the binary form of the public key

```
ragnarok# show security ssh-pub-key brief fedallah
login-name:
fedallah
finger-print:
    c4:a0:eb:79:5b:19:01:f1:9c:50:b3:6a:6a:7c:63:d5
finger-print-raw:
```

```
    ac:27:58:14:a9:7e:83:fd:61:c0:5c:c8:ef:78:e0:9c
ragnarok#
```

This command displays summary information for a specific SSH public key (in this case *fedallah*).

```
ragnarok# show security ssh-pub-key detail fedallah
host-name:
    fedallah
comment:
    "2048-bit RSA, converted from OpenSSH by klee@acme54"
finger-print:
    c4:a0:eb:79:5b:19:01:f1:9c:50:b3:6a:6a:7c:63:d5
finger-print-raw:
    ac:27:58:14:a9:7e:83:fd:61:c0:5c:c8:ef:78:e0:9c
pub-key:

AAAAB3NzaC1yc2EAAAABIwAAAQEA7OBf08jJe7MSMgerjDTgZpbPblrX4n17LQJgP
C7clLcDGEtKSiVt5MjcSav3v6AEN2pYZihOxd2ZzismpooO19kkJ56s/IjGstEzqX
MKHKUr9mBVqvqIEOTqbowEi5sz2AP31GUjQTCKZRF1XOQx8A44vHZCum93/jfNRsn
WQ1mhHmaZMmT2LShOr4J/Nlp+vpsvpdrolV6Ftz5eiVfgocxrDrjNcVtsAMyLBpDd
L6e9XebQzGSS92TPuKP/yqzLJ2G5NVFhxdw5i+FvdHz1vBdvB5O5y2QPj/iz1u3TA
/3O7tyntBOb7beDyIrg64Azc8G7E3AGiH49LnBtlQf/aw==

modulus: (256)
ECE05FD3C8C97BB3123207AB8C34E06696CF6E5AD7E27D7B2D02603C2EDC94B70
3184B4A4A256DE4C8DC49ABF7BFA004376A5866284EC5DD99CE2B26A68A34D7D9
24279EACFC88C6B2D133A9730A1CA52BF66055AAFA8810E4EA6E8C048B9B33D80
3F7D4652341308A6511755CE431F00E38BC7642BA6F77FE37CD46C9D64359A11E
66993264F62D284EAF827F365A7EBE9B2FA5DAE8955E85B73E5E8957E0A1CC6B0
EB8CD715B6C00CC8B0690DD2FA7BD5DE6D0CC6492F764CFB8A3FFCAACCB2761B9
355161C5DC398BE16F747CF5BC176F079D39CB640F8FF8B3D6EDD303FDCEEEDCA
7B4139BEDB783C88AE0EB803373C1BB137006887E3D2E706D9507FF6B
exponent: (1)
23

ragnarok#
```

This command displays detailed information for specific SSH public key (in this case *fedallah,* an RSA key).

host-name

contains the name assigned to the RSA key when it was first imported

finger-print

contains the output of an MD5 hash computed across the base64-encoded RSA public key

finger-print-raw

contains the output of an MD5 hash computed across the binary form of the RSA public key

public key

contains the base64-encoded RSA key

modulus

contains the hexadecimal modulus (256) of the RSA key

exponent

(also known as *public exponent* or *encryption exponent*) contains an integer value that is used during the RSA key generation algorithm. Commonly used values are 17 and 65537. A prime exponent greater than 2 is generally used for more efficient key generation.

```
ragnarok# show security ssh-pub-key detail acme74
host-name:
    acme74
comment:
    DSA Public Key
finger-print:
    51:2f:f1:dd:79:9e:64:85:6f:22:3d:fe:99:1f:c8:21
finger-print-raw:
    0a:ba:d8:ef:bb:b4:41:d0:dd:42:b0:6f:6b:50:97:31
pub-key:

AAAAB3NzaC1kc3MAAACBAPY8ZOHY2yFSJA6XYC9HRwNHxaehvx5wOJ0rzZdzoSOXx
bETW6ToHv8D1UJ/z+zHo9Fiko5XybZnDIaBDHtblQ+Yp7StxyltHnXF1YLfKD1G4T
6JYrdHYI14Om1eg9e4NnCRleaqoZPF3UGfZia6bXrGTQf3gJq2e7Yisk/gF+1VAAA
AFQDb8D5cvwHWTZDPfX0D2s9Rd7NBvQAAAIEAlN92+Bb7D4KLYk3IwRbXblwXdkPg
gA4pfdtW9vGfJ0/RHd+NjB4eo1D+0dix6tXwYGN7PKS5R/FXPNwxHPapcj9uL1Jn2
AWQ2dsknf+i/FAAvioUPkmdMc0zuWoSOEsSNhVDtX3WdvVcGcBq9cetzrtOKWOocJ
mJ80qadxTRHtUAAACBAN7CY+KKv1gHpRzFwdQm7HK9bb1LAo2KwaoXnadFgeptNBQ
eSXG1vO+JsvphVMBJc9HSn24VYtYtsMu74qXviYjziVucWKjjKEb11juqnF0GDlB3
VVmxHLmxnAz643WK42Z7dLM5sY29ouezv4Xz2PuMch5VGPP+CDqzCM4loWgV

p: (128)
F63C64E1D8DB2152240E97602F47470347C5A7A1BF1E70389D2BCD9773A12397C
5B1135BA4E81EFF03D5427FCFECC7A3D162928E57C9B6670C86810C7B5B950F98
A7B4ADC7296D1E75C5D582DF283D46E13E8962B747608D783A6D5E83D7B836709
195E6AAA193C5DD419F6626BA6D7AC64D07F7809AB67BB622B24FE017ED55
q: (20)
DBF03E5CBF01D64D90CF7D7D03DACF5177B341BD
g: (128)
94DF76F816FB0F828B624DC8C116D76E5C177643E0800E297DDB56F6F19F274FD
11DDF8D8C1E1EA350FED1D8B1EAD5F060637B3CA4B947F1573CDC311CF6A9723F
6E2F5267D80590D9DB249DFFA2FC5000BE2A143E499D31CD33B96A12384B12361
543B57DD676F55C19C06AF5C7ADCEBB4E2963A8709989F34A9A7714D11ED5
pub_key: (128)
DEC263E28ABF5807A51CC5C1D426EC72BD6DBD4B028D8AC1AA179DA74581EA6D3
4141E4971B5BCEF89B2FA6154C04973D1D29F6E1562D62DB0CBBBE2A5EF8988F3
895B9C58A8E32846F5D63BAA9C5D060E50775559B11CB9B19C0CFAE3758AE3667
B74B339B18DBDA2E7B3BF85F3D8FB8C721E5518F3FE083AB308CE25A16815

ragnarok#
```

This command displays detailed information for specific SSH public key (in this case *acme74*, a DSA key).

host name

contains the name assigned to the DSA public key when it was first imported

comment

contains any comments associated with the DSA key

finger-print

contains the output of an MD5 hash computed across the base64-encoded DSA public key

finger-print-raw

contains the output of an MD5 hash computed across the binary form of the DSA public key

public key

contains the base64 encoded DSA key

p

contains the first of two prime numbers used for key generation

q

contains the second of two prime numbers used for key generation

g

contains an integer that together with p and q are the inputs to the DSA key generation algorithm

```
ragnarok# show security ssh-pub-key detail
...
...
...
ragnarok#
```

This command displays detailed information for all SSH imported keys

Starting and Stopping HDR using the ACLI

For ease-of-use, you can start and stop record collection from Acme Packet's command line interface (ACLI) in Superuser Mode. You can start and stop record collection for the entire HDR process, or you can specify a group name for which you want to start and stop collection.

Starting HDR

To start record collections:

- In Superuser mode, at the root prompt, enter **request collect start all** and press <**Enter**>. The Net-Net SD starts all record collection.

```
ACMEPACKET# request collect start all
```

To start a group-name record collection:

- In Superuser mode, at the root prompt, enter **request collect start <group-name>**, and press <**Enter**>. The Net-Net SD starts collection for that group name only. In the following example, "voltage" record collection is started.

```
ACMEPACKET# request collect start voltage
```

Stopping HDR

To stop all record collections:

- In Superuser mode, at the root prompt, enter **request collect stop all** and press <**Enter**>. The Net-Net SD stops all record collection.

```
ACMEPACKET# request collect stop all
```

To stop a group-name record collection:

- In Superuser mode, at the root prompt, enter **request collect stop <group-name>**, and press <**Enter**>. The Net-Net SD stops collection for that group name only. In the following example, "voltage" record collection is stopped.

```
ACMEPACKET# request collect stop voltage
```

Purging HDR Data using the ACLI

Using the ACLI, you can delete all HDR record collections resident on the Net-Net SD.

To purge all record collections:

- In Superuser mode, at the root prompt, enter **request collect purge** and press <**Enter**>. The Net-Net SD deletes all record collections.

```
ACMEPACKET# request collect purge
```

Restarting HDR using the ACLI

You can restart the collector using the boot configuration.

To restart the collector using the boot configuration:

- In Superuser mode, at the root prompt, enter **request collect restart** and press <**Enter**>. The Net-Net SD restarts all record collections using the boot configuration.

```
ACMEPACKET# request collect restart
```

Requesting HDR Collection Status

You can display the status of collection groups and push servers on the Net-Net SD, when required, using the ACLI.

To display the status of collection groups and push servers:

- In Superuser mode, at the root prompt, enter **request collect status** and press <**Enter**>. The Net-Net SD displays the current status of all record collections and push receivers. In the following example, the group, "fan" is disabled at boot time, the start time is immediately when the system comes up, and there is no end time. The Push Receiver configured for this Net-Net SD is 172.30.11.16 and it is currently reachable. The date and time of the next scheduled push is also indicated as well as the interval of time between each push.

```
ACMEPACKET# request collect status
Collector is currently collecting on:
Group    Boot-State     Start Time      End Time
fan      disabled       now             never

Next Push Scheduled for: 2008-01-11-11:12:06
Subsequent Push Interval: 15 minutes

Registered push receivers are:
IP Address      Status
172.30.11.16    reachable
```

3 HDR Groups and Group Statistics

Introduction

This section provides information about the Historical Data Recording (HDR) Groups and Group Statistics that make up the HDR records on the Net-Net C-Series products. It also includes information about the source of the HDR data.

HDR Data

HDR data consists of a "Group" with associated "Group Statistics" that apply to each group. HDR data comes from two sources:

- Simple Network Management Protocol (SNMP) Management Information Bases (MIBs) (MIB-Associated Groups and Group Statistics (42))
- Acme Packet's Command Line Interface (ACLI) (ACLI-Associated Groups and Group Statistics (81))

When you configure HDR on the Net-Net Session Director (SD), the Groups and associated Group Statistics are included in the collection of data. You can configure the Net-Net SD to collect all group statistics or specific group statistics. For information on configuring global collection, see Setting Global Collection (22). For information on specific group collections, see Setting Multiple Collection Groups (24).

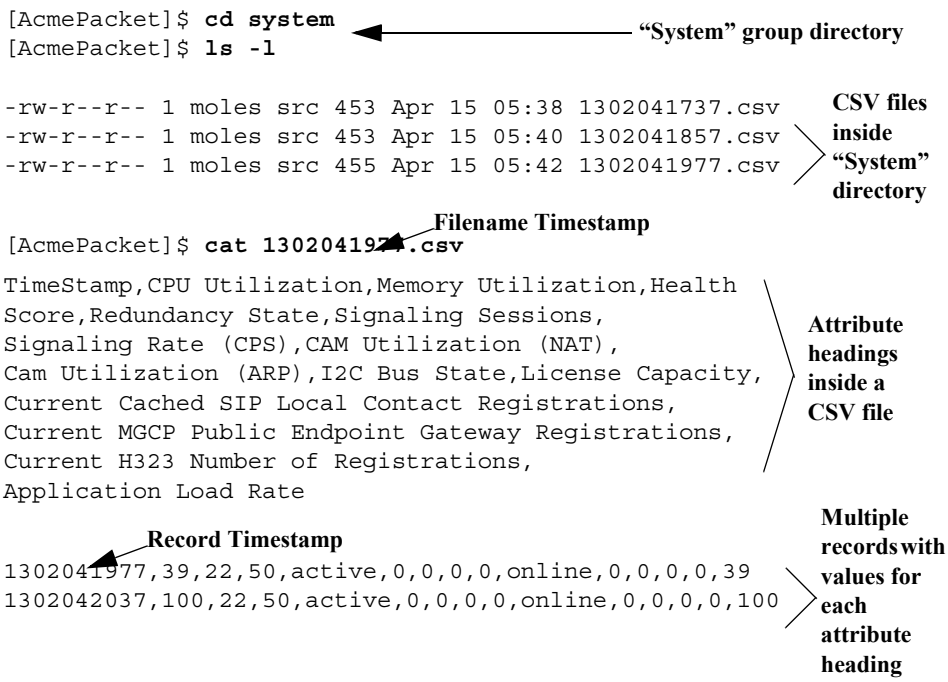
When HDR is enabled, the Net-Net SD forwards statistical records to push servers which send the data (in standard format) to a receiving server for viewing in a comma-separated value (CSV) file. Before pushing a file, the collector creates the directory by group name for which the statistic belongs (for example, *fan*, *sip-client*, *system*, etc.), if the directory does not exist from a previous push.

The collector can push multiple CSV files per directory. Each file is formatted as <*Unix timestamp*>.*csv* (for example, *1302041977.csv*). Within the file, each record also has an associated record timestamp. The **filename timestamp** is the time that the CSV file was create. The **record timestamp** is the window of time that the HDR collector used to collect the data. For more information on windows of time, see Windows of Time (40).

The first record of each file is a header containing the attribute name. For example, in the "*System*" directory, a file name of "*13020441977.csv*" can contain the header attribute names of CPU Utilization, Memory Utilization, Health Score, Redundancy State, etc. The collector appends a Timestamp heading attribute to the beginning of every record as well.

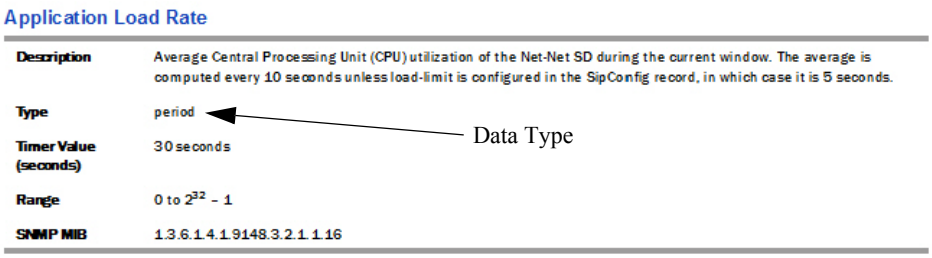
> **Note:** The records in a CSV file may display differently, depending on the record data included in the file, and the method used to open the file. For more information about the display of record data in a CSV file, see Appendix A, CSV File Data Formats (171).

The following example shows the output from a "System" HDR collection. The output format reflects that the file was opened using the Unix command "cat <timestamp>.csv".



Windows of Time

Each table in this chapter identifies a data type for a Group Statistic: counter, gauge, config, timeticks, and period. The following illustration shows the "Application Load Rate" Group Statistic table with a data type of "period".



Note: For more information about Group Statistic data types, see What is HDR? (17).

A period type represents a value determined as the sum of a number of events which occurred during a specified window of time (or a time period). There are three possible "windows" in which events can occur:

- current window
- previous window
- sliding window

The following paragraphs describe each of these windows.

The **current window** is the window during which events are currently being accumulated. The current window ends D seconds after the start of the current window, where D is the duration of the window. The current window is always of size Dc < D. Once the current window becomes of size D, it becomes the previous window, and a new current window is started.

The **previous window** is the time period of duration D which ended at the start of the current window.

The **sliding window** marks the period of time for the previous window, D, plus the time passed in the current window. For example: For the "session-agent" and "session-realm" HDR groups, the default timer value is 30 seconds. The "current window" is between 0 and 30 seconds. When the current window reaches 30 seconds it becomes the previous window and a new current window is initialized. The "sliding window" is the sum of the current window and previous window. Therefore the initial sliding window is between 0 and 30 seconds and after that the sliding window is between 30 and 60 seconds.

For the session-agent statistics and the session-realm statistics groups, the default period timer is 30 seconds. In the Net-Net SD configuration, if the sustained-rate-window parameter is not configured, the default window size is 30 seconds. If the sustained-rate-window parameter is configured, the default period is set to the configured value of the sustained-rate-window.

MIB-Associated Groups and Group Statistics

The Groups and Group Statistics in this section are a subset of MIB variables on the Net-Net SD. Each table specifies the MIB that pertains to the Group or Group Statistics. Groups in this section include:

*In addition to being a subset of a MIB variable, the session-agent Group maps to the "show sipd agents" command, the registration-realm Group maps to the "show sipd realms", and some statistics in the session-realm Group map to the "show sipd realms" command. For more information, see Chapter 4, the section, show sipd agents (152) and show sipd realms (162).

Group: system

Description	Group name that consists of general system statistics.
HDR Statistics	• CPU Utilization • Memory Utilization • Health Score • Redundancy State • Signaling Sessions • Signaling Rate (CPS) • CAM Utilization (NAT) • CAM Utilization (ARP) • I2C Bus State • License Capacity • Current Cached SIP Local Contact Registrations • Current MGCP Public Endpoint Gateway Registrations • Current H323 Number of Registrations • Application Load Rate • Current Deny Entries
SNMP MIB	ap-smgmt.mib apSysMgmtGeneralObjects 1.3.6.1.4.1.9148.3.2.1.1

Group Statistics

CPU Utilization

Description	Percentage of total usage of Session Director's (SD) central processing unit (CPU).
Type	gauge
Timer Value (seconds)	N/A
Range	0% to 100%
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.1.1

Memory Utilization

Description	Percentage of total memory usage on SD
Type	gauge
Timer Value (seconds)	N/A
Range	0% to 100%
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.1.2

Health Score

Description	Percentage of system health with a value of 100% being the healthiest.
Type	gauge
Timer Value (seconds)	N/A
Range	0% to 100%
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.1.3

Redundancy State

Description	For Net-Net high availability (HA), specifies whether this Net-Net SD is active or standby. A standalone system has an active state.	
Type	integer	
Timer Value (seconds)	N/A	
Range	active (1)	System is in active mode.
	standby (2)	System is in standby mode.
	unassigned (3)	System has not been assigned as “active” or “standby”.
	recovery (4)	System is in recovery mode.
	outOfService (5)	System is currently out of service. Contact your Technical Support representative.
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.1.4	

Signaling Sessions

Description	Total number of global, concurrent, active sessions in real time.
Type	gauge
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.1.5

Signaling Rate (CPS)

Description	Total number of calls per second (CPS). This is a real-time value which is the sum of SIP H.323 and Media Gateway Control Protocol (MGCP) calls.
Type	gauge
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.1.6

CAM Utilization (NAT)

Description	Percentage of Content Addressable Memory (CAM) usage for Network Address Translation (NAT).
Type	gauge
Timer Value (seconds)	N/A
Range	0% to 100%
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.1.7

CAM Utilization (ARP)

Description	Percentage of Content Addressable Memory (CAM) usage for Address Resolution Protocol (ARP).
Type	gauge
Timer Value (seconds)	N/A
Range	0% to 100%
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.1.8

I2C Bus State

Description	Current SD state.	
Type	integer	
Timer Value (seconds)	N/A	
Range	online (0)	SD is online and processing calls.
	becomingoffline (1)	SD is in the process of going offline.
	offline (2)	SD is offline and not processing calls. However, other administrative functions are available.
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.1.9	

License Capacity

Description	Percentage of licensed SD sessions currently in progress.
Type	gauge
Timer Value (seconds)	N/A
Range	0% to 100%
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.1.10

Current Cached SIP Local Contact Registrations

Description	Total number of currently cached registered contacts in the SD.
Type	gauge
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.1.11

Current MGCP Public Endpoint Gateway Registrations

Description	Total number of registered Media Gateway Control Protocol (MGCP) gateway endpoints in the SD.
Type	gauge
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.1.12

Current H323 Number of Registrations

Description	Total number of H323 registrations in the SD.
Type	gauge
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.1.13

Application Load Rate

Description	Average Central Processing Unit (CPU) utilization of the Net-Net SD during the current window. The average is computed every 10 seconds unless load-limit is configured in the SipConfig record, in which case it is 5 seconds.
Type	period
Timer Value (seconds)	30 seconds
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.1.16

Current Deny Entries Allocated

Description	The total number of endpoints currently denied.
Type	integer
Timer Value (seconds)	NA
Range	0 to $2^{32} - 1$
SNMP MIB	.1.3.6.1.4.1.9148.3.2.1.1.26

Group: interface

Description	Consists of statistics pertaining to the physical interface(s) on the SD.
HDR Statistics	• Index • Description • Type • MTU • Speed • Physical Address • Admin Status • Operational State • IfLastChange • InOctets • InUnicastPackets • InNon-UnicastPackets • InDiscards • OutErrors • OutOctets • OutUnicastPackets • OutNon-UnicastPackets • OutDiscards • InErrors
SNMP MIB	rfc2863.mib ifEntry 1.3.6.1.2.1.2.2.1

Group Statistics

Index

Description	Unique value that identifies the interface.
Type	config
Timer Value (seconds)	N/A
Range	N/A
SNMP MIB	1.3.6.1.2.1.2.2.1.1

Description

Description	String that provides a description of the interface.
Type	config
Timer Value (seconds)	N/A
Range	N/A
SNMP MIB	1.3.6.1.2.1.2.2.1.2

Type

Description	Type of interface distinguished according to the Physical/Link Protocol(s).
Type	config
Timer Value (seconds)	N/A
Range	N/A
SNMP MIB	1.3.6.1.2.1.2.2.1.3

MTU

Description	Maximum Transmission Unit (MTU) - largest datagram size, in octets (eight-bit bytes), that can be sent/received on the interface specified in octets.
Type	config
Timer Value (seconds)	N/A
Range	N/A
SNMP MIB	1.3.6.1.2.1.2.2.1.4

Speed

Description	Estimate of the current bandwidth, in bits per second, on the interface.
Type	config
Timer Value (seconds)	N/A
Range	N/A
SNMP MIB	1.3.6.1.2.1.2.2.1.5

Physical Address

Description	IP Address of the interface at the protocol layer immediately below the network layer in the protocol stack.
Type	config
Timer Value (seconds)	N/A
Range	N/A
SNMP MIB	1.3.6.1.2.1.2.2.1.6

Admin Status

Description	Current administrative state of the interface.
Type	config
Timer Value (seconds)	N/A
Range	N/A
SNMP MIB	1.3.6.1.2.1.2.2.1.7

Operational State

Description	Current operational state of the interface.	
Type	integer	
Timer Value (seconds)	N/A	
Range	up(1)	Interface is operational and in the UP state.
	down(2)	Interface is not operational and in the DOWN state.
	testing(3)	Interface is in TESTING state.
	unknown(4)	Interface state is UNKNOWN.
	dormant(5)	Interface is inactive and in DORMANT state.
	notPresent(6)	No interface is present.
	lowerLayerDown(7)	Lower layer protocol on the interface is down.
SNMP MIB	1.3.6.1.2.1.2.2.1.8	

IfLastChange

Description	Specifies the sysUpTime (system up time) value with the time the interface entered its current operational state
Type	timeticks
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.2.1.2.2.1.9

InOctets

Description	Total number of octets received on the interface.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.2.1.2.2.1.10

InUnicastPackets

Description	Number of subnetwork-unicast packets delivered to a higher layer protocol. A unicast packet is a regular IP packet that has a destination IP address.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.2.1.2.2.1.11

InNon-UnicastPackets

Description	Number of non-unicast packets (i.e., subnetwork-broadcast or subnetwork-multicast packets) delivered to a higher layer protocol.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.2.1.2.2.1.12

InDiscards

Description	Number of inbound packets that were discarded even though no errors had been detected. This prevented the packets from being delivered to a higher-layer protocol.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.2.1.2.2.1.13

InErrors

Description	Number of inbound packets that contained errors, preventing them from being delivered to a higher-layer protocol.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.2.1.2.2.1.14

OutOctets

Description	Total number of octets sent out the interface.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.2.1.2.2.1.16

OutUnicastPackets

Description	Total number of packets that higher-level protocols requested be transmitted to a subnetwork-unicast address, including packets that were discarded or not sent.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.2.1.2.2.1.17

OutNon-UnicastPackets

Description	Total number of packets that higher-level protocols requested be transmitted to a non-unicast address (i.e., subnetwork-broadcast or subnetwork-multicast addresses), including packets that were discarded or not sent.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.2.1.2.2.1.18

OutDiscards

Description	Number of outbound packets discarded even though no errors were detected, to prevent the packets from being transmitted.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.2.1.2.2.1.19

OutErrors

Description	Number of outbound packets that were not transmitted because of errors.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.2.1.2.2.1.20

Group: session-agent

Description	A signaling endpoint that applies traffic-shaping attributes and information regarding next hops or previous hops.
HDR Statistics	• Hostname • System Type • Status • Inbound Active Sessions • Inbound Session Rate • Outbound Active Sessions • Outbound Session Rate • Inbound Sessions Admitted • Inbound Sessions Not Admitted • Inbound Concurrent Sessions High • Inbound Average Session Rate • Outbound Sessions Admitted • Outbound Sessions Not Admitted • Outbound Concurrent Sessions High • Outbound Average Sessions Rate • Max Burst Rate • Total Seizures • Total Answered Sessions • Answer/Seizure Ratio • Average One-Way Signaling Latency • Maximum One-Way Signaling Latency
SNMP MIB	ap-smgmt.mib apCombinedSessionAgentStatsEntry 1.3.6.1.4.1.9148.3.2.1.2.1.1

Group Statistics

Hostname

Description	Hostname of the session agent, in Fully Qualified Domain Name (FQDN) or IP Address format, for which the group statistics are being calculated.
Type	config
Timer Value (seconds)	N/A
Range	N/A
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.1.1.2
ACLI "Show" Command	show sipd agents
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd agents (152).

System Type

Description	Type of the specified session agent – either SIP or H323.
Type	config
Timer Value (seconds)	N/A
Range	N/A
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.1.1.3

Status

Description	Current state of the specified session agent.	
Type	integer	
Timer Value (seconds)	N/A	
Range	disabled	Session agent is disabled.
	outofService	Session agent is out of service.
	standby	Session agent in standby mode.
	inService	Session agent is in service.
	constraintsViolation	Session agent has a signaling & bandwidth constraints violation.
	inServiceTimedOut	Session agent that is currently in Service has timed out because of inactivity.
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.1.1.22	

Inbound Active Sessions

Description	Total number of current, active, inbound sessions.
Type	gauge
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.1.1.4
ACLI "Show" Command	show sipd agents
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd agents (152).

Inbound Session Rate

Description	Current inbound session rate in calls per second (CPS) during the sliding window period.
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.1.1.5
ACLI "Show" Command	show sipd agents
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd agents (152).

Outbound Active Sessions

Description	Total number of current, active, outbound sessions.
Type	gauge
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.1.1.6
ACLI "Show" Command	show sipd agents
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd agents (152).

Outbound Session Rate

Description	Current outbound session rate in calls per second (CPS) during the sliding window period.
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.1.1.7
ACLI "Show" Command	show sipd agents
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd agents (152).

Inbound Sessions Admitted

Description	Total number of inbound sessions admitted during the sliding window period.
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.1.1.8
ACLI "Show" Command	show sipd agents
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd agents (152).

Inbound Sessions Not Admitted

Description	Total number of inbound sessions rejected because of insufficient bandwidth during the sliding window period.
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.1.1.9

Inbound Concurrent Sessions High

Description	Highest number of concurrent inbound sessions during the sliding window period.
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.1.1.10

Inbound Average Session Rate

Description	Average rate of inbound sessions during the sliding window period in calls per second (CPS).
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.1.1.11

Outbound Sessions Admitted

Description	Total number of outbound sessions admitted during the sliding window period.
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.1.1.12
ACLI "Show" Command	show sipd agents
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd agents (152).

Outbound Sessions Not Admitted

Description	Total number of outbound sessions rejected due to insufficient bandwidth during the sliding window period.
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.1.1.13

Outbound Concurrent Sessions High

Description	Highest number of concurrent outbound sessions during the sliding window period.
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.1.1.14

Outbound Average Sessions Rate

Description	Average rate of outbound sessions during the sliding window period in calls per second (CPS).
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.1.1.15

Max Burst Rate

Description	Burst rate of traffic (both inbound and outbound) measured during the current window period. The time period is equal to the value of the configuration parameter burst-rate-window in the session constraint or session-agent configuration record. It is equal to 1 if not configured. Its value is the number of active calls plus 1 divided by the time period. This is different from the Max Burst Rate value in the ACLI command "show sipd agent". In the ACLI it is the high-water mark during the window period.
Type	period
Timer Value (seconds)	10
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.1.1.16
ACLI "Show" Command	show sipd agents
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd agents (152).

Total Seizures

Description	Total number of seizures during the sliding window period.
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.1.1.17
ACLI "Show" Command	show sipd agents
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd agents (152).

Total Answered Sessions

Description	Total number of answered sessions during the sliding window period.
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.1.1.18
ACLI "Show" Command	show sipd agents
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd agents (152).

Answer/Seizure Ratio

Description	Answer-to-seizure ratio expressed as a percentage during the sliding window period. For example, a value of 90 would represent 90% or .90.
Type	period
Timer Value (seconds)	30
Range	0% to 100%
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.1.1.19

Average One-Way Signaling Latency

Description	Average observed one-way signaling latency during the current window period. This is the average amount of time the signaling travels in one direction. Each latency measurement used to calculate this average begins with a request and ends with its first response. Subsequent responses do not affect this measurement. For example, if a 100 Trying arrives as the first response to an INVITE, the system uses that latency for this purpose. Requests that trigger these measurements include every request that receives a response.
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.1.1.20
ACLI "Show" Command	show sipd agents
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd agents (152).

Maximum One-Way Signaling Latency

Description	Maximum observed one-way signaling latency during the sliding window period. This is the maximum amount of time the signaling travels in one direction. Each latency measurement used to identify this maximum begins with a request and ends with its first response. Subsequent responses do not affect this measurement. For example, if a 100 Trying arrives as the first response to an INVITE, the system uses that latency for this purpose. Requests that trigger these measurements include every request that receives a response.
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.1.1.21
ACLI "Show" Command	show sipd agents
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd agents (152).

Group: session-realm

Description	A collection of Web security servers in a single Domain Name System (DNS) that are configured to share sessions.
HDR Statistics	• Realm Name • Inbound Active Sessions • Inbound Session Rate • Outbound Active Sessions • Outbound Session Rate • Inbound Sessions Admitted • Inbound Sessions Not Admitted • Inbound Concurrent Sessions High • Inbound Average Session Rate • Outbound Sessions Admitted • Outbound Sessions Not Admitted • Outbound Concurrent Sessions High • Outbound Average Sessions Rate • Max Burst Rate • Total Seizures • Total Answered Sessions • Answer/Seizure Ratio • Average One-Way Signaling Latency • Maximum One-Way Signaling Latency • Average QoS RFactor • Maximum QoS RFactor • Current QoS Major Exceeded • Total QoS Major Exceeded • Current QoS Critical Exceeded • Total QoS Critical Exceeded • Early Sessions • Successful Sessions • Active Local Contacts • Active Subscriptions • SubscriptionsPerMax • Subscriptions High • Total Subscriptions
SNMP MIB	ap-smgmt.mib apSigRealmStatsEntry 1.3.6.1.4.1.9148.3.2.1.2.4.1
ACLI "Show" Command	show sipd realms **Note**: The statistic tables in this section identify the statistics that display in the "show sipd realms" output. Not all statistics are applicable to this show command.
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Group Statistics

Realm Name

Description	Name of the realm for which the group statistics are being calculated.
Type	config
Timer Value (seconds)	N/A

Range	N/A
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.4.1.2

Inbound Active Sessions

Description	Total number of current, active, inbound sessions.
Type	gauge
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.4.1.3
ACLI "Show" Command	show sipd realms
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Inbound Session Rate

Description	Current inbound session rate in calls per second (CPS) during the sliding window period.
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.4.1.4

Outbound Active Sessions

Description	Total number of current, active, outbound sessions.
Type	gauge
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.4.1.5
ACLI "Show" Command	show sipd realms
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Outbound Session Rate

Description	Current outbound session rate in calls per second (CPS) during the sliding window period.
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.4.1.6

Inbound Sessions Admitted

Description	Total number of inbound sessions during the sliding window period.
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.4.1.7

Inbound Sessions Not Admitted

Description	Total number of inbound sessions rejected because of insufficient bandwidth during the sliding window period.
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.4.1.8

Inbound Concurrent Sessions High

Description	Highest number of concurrent inbound sessions during the sliding window period.
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.4.1.9

Inbound Average Session Rate

Description	Average rate of inbound sessions during the sliding window period in calls per second (CPS).
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.4.1.10

Outbound Sessions Admitted

Description	Total number of outbound sessions admitted during the sliding window period.
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.4.1.11

Outbound Sessions Not Admitted

Description	Total number of outbound sessions rejected due to insufficient bandwidth during the sliding window period.
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.4.1.12

Outbound Concurrent Sessions High

Description	Highest number of concurrent outbound sessions during the sliding window period.
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.4.1.13

Outbound Average Sessions Rate

Description	Average rate of outbound sessions during the sliding window period in calls per second (CPS).
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.4.1.14

Max Burst Rate

Description	Burst rate of traffic (both inbound and outbound) measured during the current window period. The time period is equal to the value of the configuration parameter burst-rate-window in the session constraint or session-agent configuration record. It is equal to 1 if not configured. Its value is the number of active calls plus 1 divided by the time period. This is different from the Max Burst Rate value in the ACLI command "show sipd agent". In the ACLI it is the high-water mark during the window period.
Type	period
Timer Value (seconds)	Equal to the burst-rate -window parameter in the Session Agent configuration record. If this value is less than 10, the timer value is set to 10.
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.4.1.15
ACLI "Show" Command	show sipd realms
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Total Seizures

Description	Total number of seizures during the sliding window period.
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.4.1.16
ACLI "Show" Command	show sipd realms
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Total Answered Sessions

Description	Total number of answered sessions during the sliding window period.
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.4.1.17
ACLI "Show" Command	show sipd realms
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Answer/Seizure Ratio

Description	Answer-to-seizure ratio expressed as a percentage during the sliding window period. For example, a value of 90 would represent 90% or .90.
Type	period
Timer Value (seconds)	30
Range	0% to 100%
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.4.1.18

Average One-Way Signaling Latency

Description	Average observed one-way signaling latency during the current window period. This is the average amount of time the signaling travels in one direction.
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.4.1.19
ACLI "Show" Command	show sipd realms
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Maximum One-Way Signaling Latency

Description	Maximum observed one-way signaling latency during the sliding window period. This is the maximum amount of time the signaling travels in one direction.
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.4.1.20
ACLI "Show" Command	show sipd realms
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Average QoS RFactor

Description	Average Quality of Service (QoS) factor observed during the current window period. Quality of service shapes traffic to provide different priority and level of performance to different data flows. R-factors are metrics in VoIP, that use a formula to take into account both user perceptions and the cumulative effect of equipment impairments to arrive at a numeric expression of voice quality. This statistic defines the call or transmission quality expressed as an R factor.
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.4.1.24
ACLI "Show" Command	show sipd realms
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Maximum QoS RFactor

Description	Maximum Quality of Service (QoS) factor observed during the sliding window period. Quality of service shapes traffic to provide different priority and level of performance to different data flows. R-factors are metrics in VoIP that use a formula to determine a numeric expression of voice quality. This statistic defines the call or transmission quality expressed as an R factor.
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.4.1.25
ACLI "Show" Command	show sipd realms
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Current QoS Major Exceeded

Description	Peg counts of the number of times the major Rfactor threshold was exceeded during the sliding window period. The peg count provides counts of calls with different service classes that occur during intervals of frequency which reliability indicate the traffic load. R-factors are metrics in VoIP that use a formula to determine a numeric expression of voice quality.
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.4.1.26
ACLI "Show" Command	show sipd realms
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Total QoS Major Exceeded

Description	Count of the number of times the major Rfactor threshold was exceeded. Provides counts of calls with different service classes that occur during intervals of frequency which reliability indicate the traffic load. R-factors are metrics in VoIP that use a formula to determine a numeric expression of voice quality.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.4.1.27
ACLI "Show" Command	show sipd realms
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Current QoS Critical Exceeded

Description	Count of the number of times the critical Rfactor threshold was exceeded during the sliding window period. Provides counts of calls with different service classes that occur during intervals of frequency which reliability indicate the traffic load. R-factors are metrics in VoIP that use a formula to determine a numeric expression of voice quality.
Type	period
Timer Value (seconds)	30
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.4.1.28

Total QoS Critical Exceeded

Description	Count of the number of times the critical Rfactor threshold was exceeded. Provides counts of calls with different service classes that occur during intervals of frequency which reliability indicate the traffic load. R-factors are metrics in VoIP that use a formula to determine a numeric expression of voice quality.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.4.1.29

Early Sessions

Description	Indicates the number of early sessions for each realm. Each time the Net-Net SBC receives an INVITE on the ingress realm or the egress realm sends an INVITE request, a counter increments if the session is established with a 200 OK response. This counter also increments in sessions when there are no 18x responses (Ringing (180), Call is Being Forwarded (181), Queued (182), Session in Progress (183)), but a 200 OK is established. This counter represents the number of sessions that have reached the early dialog state or later.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	N/A
ACLI "Show" Command	show sipd realms
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Successful Sessions

Description	Indicates the number of successful sessions for each realm. Successful sessions are when the Net-Net SBC receives a successful 200 OK response from an initial INVITE request. **Note**: This counter is NOT incremented for re-INVITES.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	N/A
ACLI "Show" Command	show sipd realms
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Active Local Contacts

Description	Current Domain count of active SIP registrations
Type	counter
Timer Value (seconds)	
Range	
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.4.1.31
ACLI "Show" Command	show sipd realms
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Active Subscriptions

Description	Current domain count of active SIP subscriptions.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd realm
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

SubscriptionsPerMax

Description	Maximum domain count of SIP subscriptions initiated during any 100 second period since the last SBC re-boot.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd realm
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Subscriptions High

Description	Maximum domain count of active SIP subscriptions since the last SBC re-boot.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd realm
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Total Subscriptions

Description	Count of lifetime total subscriptions for the SD.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.2.4.1.35

Group: voltage

Description	Current operating voltages for components in the Net-Net Session Director (SD).
HDR Statistics	• Type • Description • Voltage (millivolts)
SNMP MIB	ap-env-monitor.mib apEnvMonVoltageStatusEntry 1.2.6.1.4.1.9148.3.3.1.2.1.1

Group Statistics

Type

Description	Type of power supply currently used on the Net-Net Session Director (SD) hardware.	
Type	string	
Timer Value (seconds)	N/A	
Range	v2p5	Uses a 2.5V power supply
	v3p3	Uses a 3.3V power supply
	v5	Uses a 5V power supply
	vdd	Uses a positive supply of voltage
	cpu	Uses the computer processing unit (CPU) power supply
SNMP MIB	N/A	

Description

Description	Textual description of the voltage currently used on the power supply in the Net-Net Session Director (SD).	
Type	string	
Timer Value (seconds)	N/A	
Range	2.5V voltage	2.5V power supply
	3.3V voltage	3.3V power supply
	5V voltage	5V power supply
	VDD voltage	Positive voltage power supply
	CPU voltage	Computer processing unit (CPU) power supply
SNMP MIB	N/A	

Voltage (millivolts)

Description	Current measurement of voltage, in millivolts (if available).
Type	gauge
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	1.2.6.1.4.1.9148.3.3.1.2.1.1.4

Group: fan

Description	Environmental fan statistics
HDR Statistics	• Location • Description • Speed
SNMP MIB	ap-env-monitor.mib apEnvMonFanStatusEntry 1.3.6.1.4.1.9148.3.3.1.4.1.1

Group Statistics

Location

Description	Physical location of the cooling fan on the circuit board in the Net-Net Session Director (SD).	
Type	string	
Timer Value (seconds)	N/A	
Range	left middle right	Located on the left of the circuit board. Located in the middle of the circuit board. Located on the right of the circuit board.
SNMP MIB	N/A	

Description

Description	Textual description that specifies the speed of the cooling fan currently installed in the Net-Net Session Director (SD).	
Type	string	
Timer Value (seconds)	N/A	
Range	Fan 1 speed Fan 2 speed Fan 3 speed	Slow speed fan Medium speed fan Fast speed fan
SNMP MIB	N/A	

Speed

Description	Current measurement of the fan speed expressed as a percentage.
Type	gauge
Timer Value (seconds)	N/A
Range	0% to 100%
SNMP MIB	1.3.6.1.4.1.9148.3.3.1.4.1.1.4

Group: temperature

Description	Environmental temperature statistics
HDR Statistics	• Type • Description • Temperature (Celsius)
SNMP MIB	ap-env-monitor.mib apEnvMonTemperatureStatusEntry 1.3.6.1.4.1.9148.3.3.1.3.1.1

Group Statistics

Type

Description	Indicates the entity being monitored for temperature.	
Type	string	
Timer Value (seconds)	N/A	
Range	ds 1624s Main	Main board on the Session Director (SD)
	ds 1624s CPU	Central processing unit (CPU)
	ds 1624s Phy0	Physical Interface 0
	ds 1624s Phy1	Physical Interface 1
	NE1775s SDRAM	Synchronous dynamic random access memory (SDRAM)
	NE1775s PMC	Polymer matrix composites (PMC)
SNMP MIB	N/A	

Description

Description	Textual description of the entity being monitored for temperature.	
Type	string	
Timer Value (seconds)	N/A	
Range	Main board PROM Temperature	Monitoring temperature on the programmable read-only memory (PROM) on the main board.
	Host processor PROM Temperature	Monitoring temperature on the host processor PROM.
	PHY0 PROM Temperature	Monitoring temperature on the Physical Interface 0 PROM.
	PHY1 PROM Temperature	Monitoring temperature on the Physical Interface 1 PROM.
	SDRAM Temperature	Monitoring temperature on the synchronous dynamic random access memory (SDRAM)
	PMC Temperature	Monitoring temperature on the polymer matrix composites (PMC)
SNMP MIB	N/A	

Temperature (Celsius)

Description	Current temperature on the main board's programmable read-only memory (PROM), in Celsius.
Type	gauge
Timer Value (seconds)	N/A
Range	0° to 100°
SNMP MIB	1.3.6.1.4.1.9148.3.3.1.3.1.1.4

Group: space

Description	Statistics that display storage space information on the Net-Net SD
HDR Statistics	• Volume Name • Space Used • Space Available
SNMP MIB	ap-env-monitor.mib apSysStorageSpaceEntry 1.3.6.1.4.1.9148.3.2.1.1.23.1

Group Statistics

Volume Name

Description	Name of the volume used for storage space.	
Type	string	
Timer Value (seconds)	N/A	
Range	hard-disk0	Hard disk volume 0
	hard-disk1	Hard disk volume 1
	hard-disk2	Hard disk volume 2
	hard-disk3	Hard disk volume 4
	/ramdrv	Random Access Memory (RAM) drive
	/boot/code	Boot code volume
	/boot	Boot volume
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.1.23.1.2	

Space Used

Description	Total space used on the volume in Megabytes (Mb)
Type	gauge
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	N/A

Space Available

Description	Total space available on the volume in Megabytes (Mb)
Type	gauge
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.1.23.1.4

Group: network-util

Description	Statistics that display network utilization information
HDR Statistics	• Index • Rx Utilization • Tx Utilization
SNMP MIB	ap-env-monitor.mib apSysMgmtPhyUtilTableEntry 1.3.6.1.4.1.9148.3.2.1.8.1.1

Group Statistics

Index

Description	An integer that contains the ifIndex of a media port
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
SNMP MIB	N/A

Rx Utilization

Description	Receive (Rx) network utilization of the physical port measured over a one second period
Type	gauge
Timer Value (seconds)	N/A
Range	0% to 100%
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.8.1.1.1

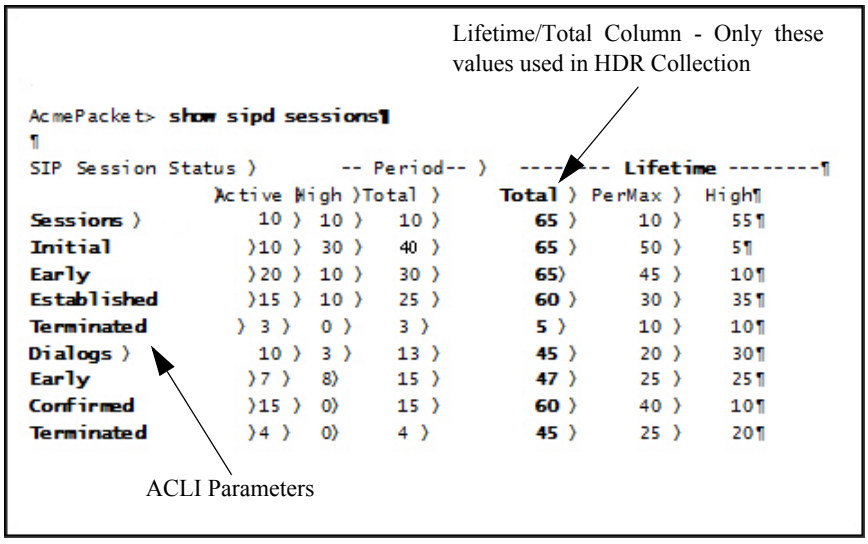
Tx Utilization

Description	Transmit (Tx) network utilization of the physical port measured over a one second period
Type	gauge
Timer Value (seconds)	N/A
Range	0% to 100%
SNMP MIB	1.3.6.1.4.1.9148.3.2.1.8.1.1.2

ACLI-Associated Groups and Group Statistics

The Groups and Group Statistics in this section correspond to the data that displays as output from some of the current ACLI commands. For example, the output for the "**show sipd sessions**" command, when run from the ACLI, is shown in the figure below:

Example of "Show" Command Output

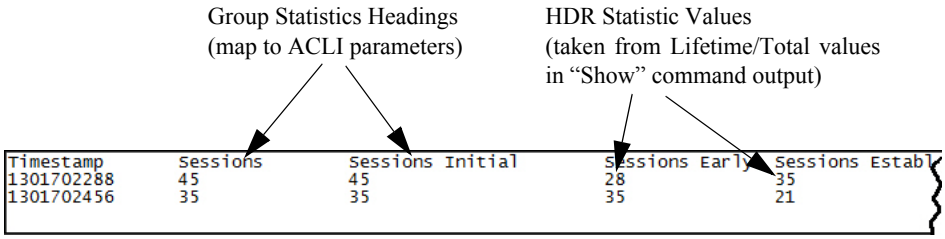


For the **sip-session group**, the HDR Collector stores the same data that would display in the "**Lifetime/Total**" column if you ran the ACLI command at the same time the Collector sampled the statistics. In the ACLI output, the data is grouped by Sessions and Dialogs. When mapped into the HDR data for the sip-session group header, the ACLI names are further clarified, as shown in the table below:

ACLI Name	Group Header Name
Sessions	Sessions
Initial	Sessions Initial
Early	Sessions Early
Established	Sessions Established
Terminated	Sessions Terminated
Dialogs	Dialogs
Early	Dialogs Early
Confirmed	Dialogs Confirmed
Terminated	Dialogs Terminated

The following is an example of a CSV file containing the HDR statistics for the "sip-session" Group generated by the HDR Collector. The output format reflects that the file was opened using an application compatible with a CSV file.

Example of a CSV File for the "sip-session" Group



> **Note:** The records in a CSV file may display differently, depending on the record data included in the file, and the method used to open the file. For more information about the display of record data in a CSV file, see Appendix A, CSV File Data Formats (171).

This section provides a description of each Group and Group Statistic associated with the ACLI. Each Group table identifies the ACLI "Show" command for which it is associated, and provides a link to the applicable command in Chapter 4.

Groups in this section include:

- Group: sip-sessions (83)
- Group: sip-acl-oper (87)
- Group: sip-acl-status (90)
- Group: sip-client (92)
- Group: sip-server (96)
- Group: sip-policy (100)
- Group: sip-errors (106)
- Group: sip-status (113)
- Group: sip-invites (121)
- Group: registration-realm (123)
- Group: enum-stats (129)
- Group: mgcp-state (131)
- Group: mgcp-trans (135)
- Group: mgcp-media-events (138)
- Group: mgcp-oper (141)
- Group: mgcp-acl (143)
- Group: h323-stats (145)

Group: sip-sessions

Description	Consists of statistics pertaining to the Session Initiation Protocol (SIP) sessions.
Group Statistics	• Sessions • Sessions Initial • Sessions Early • Sessions Established • Sessions Terminated • Dialogs • Dialogs Early • Dialogs Confirmed • Dialogs Terminated
ACLI "Show" Command	show sipd sessions
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd sessions (151).

Group Statistics

Sessions

Description	Total number of sessions established by INVITE and SUBSCRIBE messages
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd sessions
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd sessions (151).

Sessions Initial

Description	Total number of sessions for which an INVITE or SUBSCRIBE is being forwarded
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd sessions
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd sessions (151).

Sessions Early

Description	Total number of sessions for which the first provisional response (1xx other than 100) is received.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd sessions
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd sessions (151).

Sessions Established

Description	Total number of sessions for which a success (2xx) response is received.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd sessions
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd sessions (151).

Sessions Terminated

Description	Total number of sessions that have ended by receiving or sending a BYE for an "Established" session or forwarding an error response for an "Initial" or "Early" session. The session remains in the terminated state until all the resources for the session are freed up.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd sessions
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd sessions (151).

Dialogs

Description	Total number of end-to-end SIP signaling connections.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd sessions
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd sessions (151).

Dialogs Early

Description	Total number of dialogs that were created by a provisional response.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd sessions
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd sessions (151).

Dialogs Confirmed

Description	Total number of dialogs that were created by a success response. An "Early" dialog transitions to "Confirmed" when a success response is received.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd sessions
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd sessions (151).

Dialogs Terminated

Description	Total number of dialogs that were ended by a receiving/sending of a BYE for an “Established” session, or a receiving/sending error response “Early” dialog. The dialog remains in the “Terminated” state until all the resources for the session are freed up.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI “Show” Command	show sipd sessions
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd sessions (151).

Group: sip-acl-oper

Description	Consists of statistics pertaining to the Session Initiation Protocol (SIP) access control list (ACL) operations.
Group Statistics	• ACL Requests • Bad Messages • Promotions • Demotions • Demote Trust-Untrust • Demote Untrust-Deny
ACLI "Show" Command	show sipd acls
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd acls (154).

Group Statistics

ACL Requests

Description	Total number of ACL requests
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd acls
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd acls (154).

Bad Messages

Description	Total number of bad messages
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd acls
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd acls (154).

Promotions

Description	Total number of ACL entry promotions. These are the ACL entries that have been promoted from untrusted to trusted status.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd acls
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd acls (154).

Demotions

Description	Total number of ACL entry demotions.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd acls
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd acls (154).

Demote Trust-Untrust

Description	Total number of ACL entries demoted from trusted to untrusted.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd acls
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd acls (154).

Demote Untrust-Deny

Description	Total number of ACL entries demoted from untrusted to deny.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd acls
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd acls (154).

Group: sip-acl-status

Description	Consists of statistics pertaining to the Session Initiation Protocol (SIP) access control list (ACL) state.
Group Statistics	• Total Entries • Trusted • Blocked
ACLI "Show" Command	show sipd acls
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd acls (154).

Group Statistics

Total Entries

Description	Total number of ACL entries, both trusted and blocked.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd acls
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd acls (154).

Trusted

Description	Total number of trusted ACL entries
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd acls
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd acls (154).

Blocked

Description	Total number of blocked ACL entries
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd acls
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd acls (154).

Group: sip-client

Description	Consists of statistics pertaining to the Session Initiation Protocol (SIP) client state.
Group Statistics	• AllStates • Initial • Trying • Calling • Proceeding • Cancelled • EarlyMedia • Completed • Setmedia • Established • Terminated
ACLI "Show" Command	show sipd client
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd client (155).

Group Statistics

AllStates

Description	Total number of all client session transactions
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd client
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd client (155).

Initial

Description	Total number of times the "Initial" state was entered due to the receipt of a request.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd client
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd client (155).

Trying

Description	Total number of times the “Trying” state was entered due to the receipt of a request
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI “Show” Command	show sipd client
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd client (155).

Calling

Description	Total number of times the “Calling” state was entered due to the receipt of an INVITE request
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI “Show” Command	show sipd client
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd client (155).

Proceeding

Description	Total number of times the “Proceeding” state was entered due to the receipt of a provisional response while in the “Calling” state
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI “Show” Command	show sipd client
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd client (155).

Cancelled

Description	Total number of INVITE transactions that received a CANCEL
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd client
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd client (155).

EarlyMedia

Description	Total number of times the "Proceeding" state was entered due to the receipt of a provisional response that contained a Session Description Protocol (SDP) while in the "Calling" state
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd client
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd client (155).

Completed

Description	Total number of times that the "Completed" state was entered due to the receipt of a status code in the range of 300-699 when either in the "Calling" or "Proceeding" state
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd client
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd client (155).

Setmedia

Description	Total number of transactions in which the Net-Net SD was setting up NAT and steering ports
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd client
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd client (155).

Established

Description	Total number of times the client received a 2xx response to an INVITE, but could not forward it because the NAT and steering port information was missing
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd client
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd client (155).

Terminated

Description	Total number of times the "Terminated" state was entered after a 2xx message
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd client
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd client (155).

Group: sip-server

Description	Consists of statistics pertaining to the Session Initiation Protocol (SIP) server state.
Group Statistics	• AllStates • Initial • Trying • Proceeding • Cancelled • Established • Completed • Confirmed • Terminated
ACLI "Show" Command	show sipd server
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd server (156).

Group Statistics

AllStates

Description	Total number of all server session transactions
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd server
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd server (156).

Initial

Description	Total number of times the "Initial" state was entered due to the receipt of a request
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd server
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd server (156).

Trying

Description	Total number of times the “Trying” state was entered due to the receipt of a request
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI “Show” Command	show sipd server
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd server (156).

Proceeding

Description	Total number of times the “Proceeding” state was entered due to the receipt of a provisional response while in the “Calling” state
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI “Show” Command	show sipd server
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd server (156).

Cancelled

Description	Total number of INVITE transactions that received a CANCEL
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI “Show” Command	show sipd server
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd server (156).

Established

Description	Total number of times the server received a 2xx response to an INVITE, but could not forward it because the NAT and steering port information was missing
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd server
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd server (156).

Completed

Description	Total number of times that the "Completed" state was entered due to the receipt of a status code in the range of 300-699 when either in the "Calling" or "Proceeding" state
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd server
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd server (156).

Confirmed

Description	Total number of times that an ACK was received while the server was in the "Completed" state and then transitioned to "Confirmed" state
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd server
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd server (156).

Terminated

Description	Total number of times the “Terminated” state was entered after a 2xx message, or never received an ACK in the “Completed” state, and then transitioned to the “Terminated” state.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI “Show” Command	show sipd server
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd server (156).

Group: sip-policy

Description	Consists of statistics pertaining to the Session Initiation Protocol (SIP) local policy / routing statistics.
Group Statistics	• Local Lookup • Local Hits • Local Misses • Local Drops • Agent Group Hits • Agent Group Misses • No Routes Found • Missing Dialog • Inb SA Constraints • Outb SA Constraints • Inb REG SA Constraints • Outb REG SA Constraints • Requests Challenged • Challenges Found • Challenges Not Found • Challenge Drops
ACLI "Show" Command	show sipd policy
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd policy (157).

Group Statistics

Local Lookup

Description	Total number of local policy lookups
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd policy
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd policy (157).

Local Hits

Description	Total number of successful local policy lookups
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd policy
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd policy (157).

Local Misses

Description	Total number of local policy lookup failures
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd policy
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd policy (157).

Local Drops

Description	Total number of local policy lookups where the next hop session agent group is H323
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd policy
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd policy (157).

Agent Group Hits

Description	Total number of successful local policy lookups for session agent groups
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd policy
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd policy (157).

Agent Group Misses

Description	Total number of successful local policy lookups where no session agent was available for the session agent group
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd policy
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd policy (157).

No Routes Found

Description	Total number of successful local policy lookups, but temporarily unable to route (for example, "session agent out of service")
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd policy
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd policy (157).

Missing Dialog

Description	Total number of local policy lookups where the dialog was not found for a request addressed to the Net-Net SD with a "To" tag or for a NOTIFY-SUBSCRIBE SIP request
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd policy
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd policy (157).

Inb SA Constraints

Description	Total number of successful local policy lookups where the inbound session agent (SA) exceeded constraints
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd policy
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd policy (157).

Outb SA Constraints

Description	Total number of successful local policy lookups where the outbound SA exceeded constraints
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd policy
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd policy (157).

Inb REG SA Constraints

Description	Total number of successful inbound local policy lookups where the registrar (REG) SA exceeded constraints
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd policy
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd policy (157).

Outb REG SA Constraints

Description	Total number of successful outbound local policy lookups where the registrar (REG) SA exceeded constraints
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd policy
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd policy (157).

Requests Challenged

Description	Total number of requests that were challenged.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd policy
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd policy (157).

Challenges Found

Description	Total number of challenges found.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd policy
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd policy (157).

Challenges Not Found

Description	Total number of challenges not found.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd policy
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd policy (157).

Challenge Drops

Description	Total number of challenges dropped.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd policy
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd policy (157).

Group: sip-errors

Description	Consists of statistics pertaining to errors that occur in SIP media events.
Group Statistics	• SDP Offer Errors • SDP Answer Errors • Drop Media Errors • Transaction Errors • Application Errors • Media Exp Events • Early Media Exps • Exp Media Drops • Expired Sessions • Multiple OK Drops • Multiple OK Terms • Media Failure Drops • Non-ACK 2xx Drops • Invalid Requests • Invalid Responses • Invalid Messages • CAC Session Drop • CAC BW Drop • Call Rejects
ACLI "Show" Command	show sipd errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd errors (158).

Group Statistics

SDP Offer Errors

Description	Total number of errors encountered in setting up the media session for a session description in a SIP request or response which is a Session Description Protocol (SDP) Offer in the Offer/Answer model (RFC 3264)
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd errors (158).

SDP Answer Errors

Description	Total number of errors encountered in setting up the media session for a session description in a SIP request or response which is a Session Description Protocol (SDP) Answer in the Offer/Answer model (RFC 3264)
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd errors (158).

Drop Media Errors

Description	Total number of errors encountered in tearing down the media for a dialog or session that is being terminated due to: a) non-successful response to an INVITE transaction, or b) a BYE transaction received from one of the participants in a dialog/session, or c) a BYE initiated by the Net-Net SD due to a timeout notification from the Middlebox Control Daemon (MBCD).
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd errors (158).

Transaction Errors

Description	Total number of errors in continuing the processing of the SIP client transaction associated with setting up or tearing down of the media session.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd errors (158).

Application Errors

Description	Total number of miscellaneous errors in the SIP application that are otherwise uncategorized
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd errors (158).

Media Exp Events

Description	Total number of flow timer expiration notifications received from the Middlebox Control Daemon (MBCD).
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd errors (158).

Early Media Exps

Description	Total number of flow timer expiration notifications received for media sessions that were not completely set up due to an incomplete or pending INVITE transaction
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd errors (158).

Exp Media Drops

Description	Total number of flow timer expiration notifications from the Middlebox Control Daemon (MBCD) that resulted in the termination of the dialog/session by the SIP application.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd errors (158).

Expired Sessions

Description	Total number of sessions terminated due to the session timer expiring
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd errors (158).

Multiple OK Drops

Description	Total number of dialogs terminated upon reception of a 200 OK response from multiple User Agent Servers (UASs) for a given INVITE transaction that was forked by a downstream proxy
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd errors (158).

Multiple OK Terms

Description	Total number of dialogs terminated upon reception of a 200 OK response that conflicts with an existing established dialog on the Net-Net SD
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd errors (158).

Media Failure Drops

Description	Total number of dialogs terminated due to a failure in establishing the media session.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd errors (158).

Non-ACK 2xx Drops

Description	Total number of sessions terminated because an ACK was not received for a 2xx response
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd errors (158).

Invalid Requests

Description	Total number of invalid requests (for example, an unsupported header was received).
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd errors (158).

Invalid Responses

Description	Total number of invalid responses (for example, no "Via" header in response)
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd errors (158).

Invalid Messages

Description	Total number of messages dropped due to parse failure
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd errors (158).

CAC Session Drop

Description	Total number of call admission control (CAC) session setup failures
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd errors (158).

CAC BW Drop

Description	Total number of call admission control (CAC) session setup failures due to insufficient bandwidth (BW)
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd errors (158).

Call Rejects

Description	Total number of calls rejected during the window.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd errors (180).

Group: sip-status

Description	Consists of statistics pertaining to Session Initiation Protocol (SIP) transactions.
Group Statistics	• Sessions • Subscriptions • Dialogs • CallID Maps • Rejections • ReINVITEs • Media Sessions • Media Pending • Client Trans • Server Trans • Resp Contexts • Saved Contexts • Sockets • Req Drops • DNS Trans • DNS Sockets • DNS Results • Session Rate • Load Rate • Active Subscriptions • SubscriptionsPerMax • Subscriptions High
ACLI "Show" Command	show sipd status
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd status (160).

Group Statistics

Sessions

Description	Total number of sessions established by INVITE and SUBSCRIBE messages
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd status
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd status (160).

Subscriptions

Description	Total number of sessions established by SUBSCRIPTION
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd status
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd status (160).

Dialogs

Description	Total number of end-to-end SIP signaling connections
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd status
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd status (160).

CallID Maps

Description	Total number of successful session header Call ID mappings
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd status
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd status (160).

Rejections

Description	Total number of rejected INVITEs
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd status
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd status (160).

ReINVITEs

Description	Total number of ReINVITEs
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd status
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd status (160).

Media Sessions

Description	Total number of successful media sessions
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd status
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd status (160).

Media Pending

Description	Total number of media sessions waiting to be established
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd status
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd status (160).

Client Trans

Description	Total number of client transactions
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd status
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd status (160).

Server Trans

Description	Total number of server transactions that have taken place on the Net-Net SD
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd status
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd status (160).

Resp Contexts

Description	Total number of response contexts
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd status
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd status (160).

Saved Contexts

Description	Total number of saved contexts
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd status
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd status (160).

Sockets

Description	Total number of SIP sockets
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd status
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd status (160).

Req Drops

Description	Total number of dropped requests
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd status
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd status (160).

DNS Trans

Description	Total number of Domain Name System (DNS) transactions
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd status
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd status (160).

DNS Sockets

Description	Total number of Domain Name System (DNS) sockets
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd status
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd status (160).

DNS Results

Description	Total number of Domain Name System (DNS) results
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd status
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd status (160).

Session Rate

Description	The rate, per second, of SIP invites allowed to or from the Net-Net SD during the sliding window period. The rate is computed every 10 seconds .
Type	fixed decimal
Timer Value (seconds)	30
Range	0.0 to 214,748,364.7
ACLI "Show" Command	show sipd status
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd status (160).

Load Rate

Description	Average Central Processing Unit (CPU) utilization of the Net-Net SD during the current window. The average is computed every 10 seconds unless the load-limit is configured in the SIPConfig record, in which case it is 5 seconds.
Type	gauge
Timer Value (seconds)	30
Range	0.0% to 100.0%
ACLI "Show" Command	show sipd status
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd status (160).

Active Subscriptions

Description	specifies the current global count of active SIP subscriptions.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd realm
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

SubscriptionsPerMax

Description	specifies the maximum global count of SIP subscriptions initiated during any 100 second period since the last SBC re-boot.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd realm
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Subscriptions High

Description	specifies the maximum global count of active SIP subscriptions since the last SBC re-boot.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd realm
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Group: sip-invites

Description	Consists of statistics pertaining to Session Initiation Protocol (SIP) INVITEs
Group Statistics	• INVITE Requests • Retransmissions • Response Retrans • Transaction Timeouts • Locally Throttled
ACLI "Show" Command	show sipd invite
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd invite (161).

Group Statistics

INVITE Requests

Description	Total number of INVITE requests
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd invite
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd invite (161).

Retransmissions

Description	Total number of retransmissions of INVITEs
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd invite
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd invite (161).

Response Retrans

Description	Total number of response retransmissions
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd invite
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd invite (161).

Transaction Timeouts

Description	Total number of INVITE request transaction timeouts
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$ for client. Server values are always "—"; transaction timeout statistics are not valid for server operations.
ACLI "Show" Command	show sipd invite
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd invite (161).

Locally Throttled

Description	Total number of INVITE requests locally throttled
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$ for client. Server values are always "—"; locally throttled statistics are not valid for server operations.
ACLI "Show" Command	show sipd invite
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd invite (161).

Group: registration-realm

Description	Statistics that display registration information (counters) for the total registrations received, number of successful registrations, and number of unsuccessful registrations for each of the following: • Initial registrations • Refresh registrations • De-Registrations
HDR Statistics	• Realm Name • Total Initial Registrations • Successful Initial Registrations • Unsuccessful Initial Registrations • Total Refresh Registrations • Successful Refresh Registrations • Unsuccessful Refresh Registrations • Total De-Registrations • Successful De-Registrations • Unsuccessful De-Registrations
ACLI "Show" Command	show sipd realms
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Group Statistics

Realm Name

Description	Name of the realm for which the group statistics are being calculated.
Type	config
Timer Value (seconds)	N/A
Range	N/A
ACLI "Show" Command	show sipd realms
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Total Initial Registrations

Description	Total number of initial registrations. This counter is incremented once for each initial REGISTER message even when the REGISTER is challenged. This counter is based on ingress (received) messages only. **Note**: This counter is not incremented when registrations are challenged by the following response messages: • 401 (Unauthorized - user authentication required) • 407 (Proxy authentication required) • 423 (Interval too brief - expiration time of the resource is too short)
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd realms
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Successful Initial Registrations

Description	Number of successful initial registrations. This counter is incremented once for each successful initial registration with a 200 OK response. This counter is based on ingress (received) messages only.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd realms
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Unsuccessful Initial Registrations

Description	Number of unsuccessful initial registrations. This counter is incremented once for each unsuccessful initial registration when the response to the initial REGISTER has a non-success status code. This counter is based on ingress (received) messages only. **Note**: This counter is not incremented when registrations are challenged by the following response messages: • 401 (Unauthorized - user authentication required) • 407 (Proxy authentication required) • 423 (Interval too brief - expiration time of the resource is too short)
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd realms
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Total Refresh Registrations

Description	Total number of registrations that were refreshed. This counter is incremented once for every refresh registration. This counter is based on ingress (received) messages only.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd realms
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Successful Refresh Registrations

Description	Total number of registrations that were successfully refreshed. This counter is incremented once for each successful refresh registration. This counter is based on ingress (received) messages only.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd realms
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Unsuccessful Refresh Registrations

Description	Total number of registrations that were unsuccessfully refreshed. This counter is incremented once for each unsuccessful refresh registration. This counter is based on ingress (received) messages only.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd realms
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Total De-Registrations

Description	Total number of registrations that de-registered. This counter is incremented once for every de-registration. This counter is based on ingress (received) messages only. In the event a de-registration message is received on a realm that is different than that of the initial registration message, the de-registration counter for the ingress realm of that de-registration message is incremented.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd realms
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Successful De-Registrations

Description	Total number of registrations that successfully de-registered. This counter is incremented once for each successful de-registration. This counter is based on ingress (received) messages only. In the event a successful de-registration message is received on a realm that is different than that of the initial registration message, the de-registration counter for the ingress realm of that successful de-registration message is incremented.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd realms
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Unsuccessful De-Registrations

Description	Total number of registrations that unsuccessfully de-registered. This counter is incremented once for each unsuccessful de-registration. This counter is based on ingress (received) messages only. In the event an unsuccessful de-registration message is received on a realm that is different than that of the initial registration message, the de-registration counter for the ingress realm of that unsuccessful de-registration message is incremented.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show sipd realms
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show sipd realms (162).

Group: enum-stats

Description	Consists of statistics pertaining to the Telephone Number Mapping (ENUM) Agent on the Net-Net SD.
Group Statistics	• Enum Agent • Queries Total • Successful Total • Not found Total • Timeout Total
ACLI "Show" Command	show enum
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show enum (166).

Group Statistics

Enum Agent

Description	Name of the ENUM Agent
Type	config
Timer Value (seconds)	N/A
Range	N/A
ACLI "Show" Command	show enum
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show enum (166).

Queries Total

Description	Total number of ENUM queries
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show enum
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show enum (166).

Successful Total

Description	Total number of successful ENUM queries
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show enum
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show enum (166).

Not found Total

Description	Total number of ENUM queries returning a "not found"
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show enum
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show enum (166).

Timeout Total

Description	Total number of ENUM query timeouts
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show enum
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show enum (166).

Group: mgcp-state

Description	Consists of statistics pertaining to the Media Gateway Control Protocol (MGCP) state on the Net-Net SD.
Group Statistics	• MGCP Sessions • CA Endpoints • GW Endpoints • Media Sessions • Client Trans • Server Trans • Pending MBCD • MGCP ALGs • Port Maps Available • Port Maps Allocated
ACLI "Show" Command	show mgcp
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp (167).

Group Statistics

MGCP Sessions

Description	Total number of MGCP sessions
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp (167).

CA Endpoints

Description	Total number of call agent (CA) endpoints
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp (167).

GW Endpoints

Description	Total number of gateway (GW) endpoints
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp (167).

Media Sessions

Description	Total number of media sessions
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp (167).

Client Trans

Description	Total number of client transactions
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp (167).

Server Trans

Description	Total number of server transactions
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp (167).

Pending MBCD

Description	Total number of pending media requests to the Middlebox Control Daemon (MBCD)
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp (167).

MGCP ALGs

Description	Total number of MGCP Application Layer Gateways (ALGs)
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp (167).

Port Maps Available

Description	Total number of port maps (i.e., IP ports) available
Type	counter
Timer Value (seconds)	N/A
Range	0 to 64511
ACLI "Show" Command	show mgcp
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp (167).

Port Maps Allocated

Description	Total number of port maps (i.e., IP ports) allocated
Type	counter
Timer Value (seconds)	N/A
Range	0 to 64511
ACLI "Show" Command	show mgcp
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp (167)

Group: mgcp-trans

Description	Consists of statistics pertaining to the Media Gateway Control Protocol (MGCP) transactions on the Net-Net SD.
Group Statistics	• Requests Received • Responses Sent • Duplicates Received • Requests Sent • Responses Received • Retransmissions Sent
ACLI "Show" Command	show mgcp
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp (167).

Group Statistics

Requests Received

Description	Total number of requests received
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp (167).

Responses Sent

Description	Total number of responses sent
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp (167).

Duplicates Received

Description	Total number of duplicates received
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp (167).

Requests Sent

Description	Total number of requests sent
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp (167).

Responses Received

Description	Total number of responses received
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp (167).

Retransmissions Sent

Description	Total number of retransmissions sent
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp (167).

Group: mgcp-media-events

Description	Consists of statistics pertaining to the Media Gateway Control Protocol (MGCP) media event errors on the Net-Net SD.
Group Statistics	• Calling SDP Errors • SDP Answer Errors • Drop Media Errors • Transaction Errors • Application Errors • Media Exp Events • Early Media Exps • Exp Media Drops
ACLI "Show" Command	show mgcp errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp errors (168).

Group Statistics

Calling SDP Errors

Description	Total number of errors encountered in setting up the media session for a session description in a Request or Response, which is a Session Description Protocol (SDP) Offer in the Offer/Answer model (RFC 3264)
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp errors (168).

SDP Answer Errors

Description	Total number of errors encountered in setting up the media session for a session description in a Request or Response, which is a Session Description Protocol (SDP) Answer in the Offer/Answer model (RFC 3264)
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp errors (168).

Drop Media Errors

Description	Total number errors encountered in tearing down the media for a session that is being terminated
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp errors (168).

Transaction Errors

Description	Total number errors in continuing the processing of the client transaction associated with setting up or tearing down of the media session
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp errors (168).

Application Errors

Description	Total number of miscellaneous errors that are otherwise uncategorized
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp errors (168).

Media Exp Events

Description	Total number of flow timer expiration notifications received from Middlebox Control Daemon (MBCD)
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp errors (168).

Early Media Exps

Description	Total number of flow timer expiration notifications received for media sessions that have not been completely set up
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp errors (168).

Exp Media Drops

Description	Total number of flow timer expiration notifications from the Middlebox Control Daemon (MBCD) that resulted in the termination of the session
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp errors
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp errors (168).

Group: mgcp-oper

Description	Consists of statistics pertaining to the Media Gateway Control Protocol (MGCP) operations on the Net-Net SD.
Group Statistics	• ACL Requests • Bad Messages • Promotions • Demotions
ACLI "Show" Command	show mgcp acls
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp acls (169).

Group Statistics

ACL Requests

Description	Total number of access control list (ACL) requests
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp acls
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp acls (169).

Bad Messages

Description	Total number of bad messages
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp acls
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp acls (169).

Promotions

Description	Total number of ACL entry promotions. These are the ACL entries that have been promoted from untrusted to trusted status.
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp acls
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp acls (169).

Demotions

Description	Total number of ACL entry demotions
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp acls
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp acls (169).

Group: mgcp-acl

Description	Consists of statistics pertaining to the Media Gateway Control Protocol (MGCP) access control list (ACL) events on the Net-Net SD.
Group Statistics	• Total Entries • Trusted • Blocked
ACLI "Show" Command	show mgcp acls
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp acls (169).

Group Statistics

Total Entries

Description	Total number of ACL entries, including both trusted and blocked
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp acls
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp acls (169).

Trusted

Description	Total number of trusted ACL entries
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp acls
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp acls (169).

Blocked

Description	Total number of blocked ACL entries
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show mgcp acls
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show mgcp acls (169).

Group: h323-stats

Description	Consists of statistics pertaining to H323 events on the Net-Net SD.
Group Statistics	• Incoming Calls • Outgoing Calls • Connected Calls • Incoming Channels • Outgoing Channels • Contexts • Queued Messages • TPKT Channels • UDP Channels
ACLI "Show" Command	show h323
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show h323 (170).

Group Statistics

Incoming Calls

Description	Total number of incoming H.323 calls
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show h323
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show h323 (170).

Outgoing Calls

Description	Total number of outgoing H.323 calls
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show h323
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show h323 (170).

Connected Calls

Description	Total number of connected H.323 calls
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show h323
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show h323 (170).

Incoming Channels

Description	Total number of established incoming calls
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show h323
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show h323 (170).

Outgoing Channels

Description	Total number of established outgoing calls
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show h323
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show h323 (170).

Contexts

Description	Total number of established H.323 contexts (or call terminations)
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show h323
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show h323 (170).

Queued Messages

Description	Total number of messages queued
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show h323
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show h323 (170).

TPKT Channels

Description	Total number of ThroughPacket (TPKT) channels open(ed)
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show h323
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show h323 (170).

UDP Channels

Description	Total number of User Datagram Protocol (UDP) channels open(ed)
Type	counter
Timer Value (seconds)	N/A
Range	0 to $2^{32} - 1$
ACLI "Show" Command	show h323
ACLI Parameter Mapping	For ACLI parameter mappings, see the table at show h323 (170).

4 HDR Show Commands

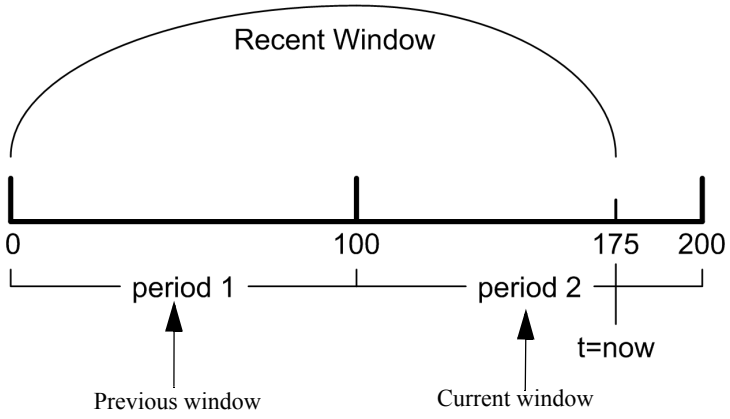
Introduction

This section provides information about the Net-Net Session Director (SD) "Show" commands you can enter at the root level of the Acme Packet Command Line Interface (ACLI). The parameters in these tables map to the Historical Data Recording (HDR) data used by the HDR Collector when generating comma-separated value (CSV) reports.

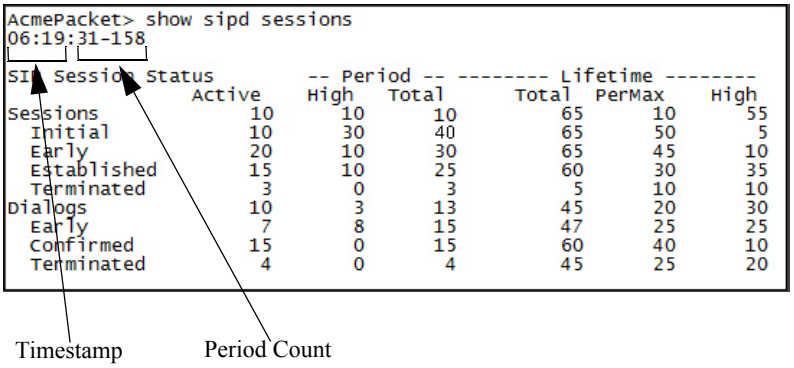
For more information about the HDR Collection data, see HDR Groups and Group Statistics (39).

Statistic Counts

For each "Show" command table output, statistical counts are based on the Net-Net SD defining a period as 100 seconds. The recent window represents the previous complete period (period 1 shown below) PLUS the time incurred into the current period (period 2 shown below). Period 1 = 100 seconds and period 2 = 75 seconds. The complete window period = 175 seconds. After period 3 is entered (not pictured below), the Recent window will begin at the 100 second mark.



When you execute a **show** command, a timestamp and period count display.



In the period count, the number after the dash, indicates the number of seconds into the recent period. In the above example, the number of seconds into the recent period is 158 seconds. Therefore, the recent window ranges from 100 to 199 seconds.

Table Column Descriptions

For each "Show" command table, the columns are defined as follows:

Column	Description
Period Active	Represents the current number of active counts
Period High	Represents the highest number during the recent window
Period Total	Represents the total accumulated count during the recent window
The Lifetime statistics begin accumulating from the last reboot.	
Lifetime Total	Represents the total accumulated count
Lifetime PerMax	Represents the maximum recorded in one period
Lifetime High	Represents the highest momentary count

Show Commands Associated with HDR Groups

This section provides ACLI show command output tables and descriptions. These show commands are associated with the HDR Groups described in the section, ACLI-Associated Groups and Group Statistics (81).

Show commands in this section include:

- show sipd sessions (151)
- show sipd agents (152)*
- show sipd acls (154)
- show sipd client (155)
- show sipd server (156)
- show sipd policy (157)
- show sipd errors (158)
- show sipd status (160)
- show sipd invite (161)
- show enum (166)
- show mgcp (167)
- show mgcp errors (168)
- show mgcp acls (169)
- show h323 (170)
- show sipd realms (162)*

*The "show sipd agents" command is associated with the "session-agent" HDR Group, and the "show sipd realms" command is associated with the "session-realm" HDR Group (in the section MIB-Associated Groups and Group Statistics (42)). The "show sipd realm" command is also associated with the "registration-realm" HDR Group in the section, ACLI-Associated Groups and Group Statistics (81).

show sipd sessions

The "**show sipd sessions**" command displays information about SIP session transactions on the Net-Net SD. These statistics include session information over Period and Lifetime monitoring spans, as well as information on active sessions. For associated HDR Group and Group Statistics, see Group: sip-sessions (83).

```
AcmePacket> show sipd sessions
06:19:31-158

SIP Session Status          -- Period -- -------- Lifetime --------
                  Active    High   Total      Total  PerMax    High
Sessions              10      10      10         65      10      55
  Initial             10      30      40         65      50       5
  Early               20      10      30         65      45      10
  Established         15      10      25         60      30      35
  Terminated           3       0       3          5      10      10
Dialogs               10       3      13         45      20      30
  Early                7       8      15         47      25      25
  Confirmed           15       0      15         60      40      10
  Terminated           4       0       4         45      25      20
```

Parameter	Description
Sessions	Number of sessions established by INVITE and SUBSCRIBE messages
Initial	Number of sessions for which an INVITE or SUBSCRIBE is being forwarded.
Early	Number of sessions for which the first provisional response (1xx other than 100) is received.
Established	Number of sessions for which a success (2xx) response is received.

Parameter	Description
Terminated	Number of sessions for which the session is ended by receiving or sending a BYE for an “Established” session or forwarding an error response for an “Initial” or “Early” session. The session remains in the “Terminated” state until all the resources for the session are freed.
Dialogs	Number of end-to-end SIP signaling connections.
Early	Number of dialogs created by a provisional response.
Confirmed	Number of dialogs created by a success response. An “Early” dialog transitions to “Confirmed” when a success response is received.
Terminated	Number of dialogs that ended by receiving/sending a BYE for an “Established” session or receiving/sending error response “Early” dialog. The dialog remains in the “Terminated” state until all the resources for the session are freed.

show sipd agents

The “**show sipd agents**” command displays statistics related to defined SIP session agents. SIP session agents can be softswitches, SIP proxies, application servers, SIP gateways, or SIP endpoints.

In addition to functioning as a single logical next hop for a signaling message (for example, where a SIP INVITE is forwarded), session agents can provide information about next or previous hops for packets in a SIP agent, including providing a list of equivalent next hops.

Entering this show command without arguments, list all SIP session agents. By adding the IP address or hostname of a session agent as well as a specified method at the end of the command, you can display statistics for that specific session agent and method. For associated HDR Group and Group Statistics, see Group: session-agent (53).

“Show sipd agents” Command

```
AcmePacket> show sipd agents
11:44:51-49 (recent)
                  ----- Inbound -----  ---- Outbound ----- -- Latency --   Max
Session Agent      Active  Rate  ConEx  Active  Rate  ConEx    Avg    Max Burst
session-agent1    I     0   0.0      0       0   0.0      0  0.000  0.000     0
session-agent2    I     0   0.0      0       0   0.0      0  0.000  0.000     0
```

Parameter	Description
Session Agent	Host name of the session agent in Fully Qualified Domain Name (FQDN) or IP Address format (softswitch, SIP proxy, application server, SIP gateway or SIP endpoint).
Inbound	
Active	Total number of current, active inbound sessions sent to the session agent.
Rate	Average rate of inbound session invitations (per second) sent to the session agent.
ConEx	Number of times that signaling & bandwidth constraints for inbound packets sent to the session agent were exceeded on the session agent. This helps determine resource availability.
Outbound	
Active	Total number of current, active outbound sessions sent to the session agent.
Rate	Average rate of outbound session invitations (per second) sent to the session agent.

Parameter	Description
ConEx	Number of times that signaling & bandwidth constraints for outbound packets were exceeded on the session agent. This helps determine resource availability.
Latency	
Avg	Average amount of time between the moment the session-agent transmits a SIP packet and the moment it reaches its destination.
Max	Maximum amount of time between the moment the session-agent transmits a SIP packet and the moment it reaches its destination.
Max Burst	Maximum burst rate for each session agent as total number of session invitations sent to or received from the session agent within the amount of time configured for the burst-rate window.

"Show sipd agents <IP address or hostname>" Command

```
AcmePacket> show sipd agents session-agent1
12:11:17-51
Session Agent session-agent1(public) [In Service]
                                -- Period -- -------- Lifetime --------
                                Active High Total    Total PerMax High
Inbound Sessions                     0    0     0        0      0    0
Rate Exceeded                        -    -     0        0      0    -
Num Exceeded                         -    -     0        0      0    -
Burst Rate                           0    0     0        0      0    0
Reg Rate Exceeded                    -    -     0        0      0    -
Outbound Sessions                    0    1    11       11     11    1
Rate Exceeded                        -    -     0        0      0    -
Num Exceeded                         -    -     0        0      0    -
Burst Rate                           0   11     0        0      0   11
Reg Rate Exceeded                    -    -     0        0      0    -
Out of Service                       -    -     0        0      0    -
Trans Timeout                        0    0     0        0      0    0
Requests Sent                        -    -     0        0      0    -
Requests Complete                    -    -     0        0      0    -
Seizure                              -    -     0        0      0    -
Answer                               -    -     0        0      0    -
ASR Exceeded                         -    -     0        0      0    -
Messages Received                    -    -    30       30     30    -
Latency=0.000; max=0.000
```

Parameter	Description
Inbound Sessions	Number of inbound SIP sessions for this session agent.
Rate Exceeded	Number of times session rate was exceeded for inbound SIP sessions on this session agent.
Num Exceeded	Number of times that signaling & bandwidth constraints for inbound SIP sessions were exceeded on this session agent. This helps determine resource availability.
Burst Rate	Number of times burst rate was exceeded for this session agent on inbound SIP sessions.
Reg Rate Exceeded	Number of times the registration rate was exceeded for this session agent on inbound SIP sessions.
Outbound Sessions	Number of outbound SIP sessions for this session agent.
Rate Exceeded	Number of times session rate was exceeded for outbound SIP sessions.
Num Exceeded	Number of times time constraints were exceeded for outbound SIP sessions.
Burst Rate	Maximum burst rate of traffic (both inbound and outbound).
Reg Rate Exceeded	Number of times the registration rate was exceeded for this session agent on outbound SIP sessions.

Parameter	Description
Out of Service	Number of times this session agent went out of service.
Trans Timeout	Number of SIP transactions that timed out for this session agent.
Requests Sent	Number of SIP requests sent via this session agent.
Requests Complete	Number of SIP requests completed for this session agent.
Seizure	Number of seizures that occurred on this session agent.
Answer	Number of answered SIP sessions on this session agent.
ASR Exceeded	Number of times that Access Service Requests (ASRs) were exceeded on this session agent.
Messages Received	Number of SIP messages received by this session agent.
Latency	Average and maximum amount of time between the moment the session-agent transmits a SIP packet and the moment it reaches its destination.

show sipd acls

An access control list (ACL) allows/denies specific sources (IP or IP:port) to access the Net-Net SD.

The "**show sipd acls**" command displays information about SIP ACL activity on the Net-Net SD. These statistics include ACL information over Period and Lifetime monitoring spans, as well as information on active ACL status. For associated HDR Group and Group Statistics, see Group: sip-acl-oper (87) and Group: sip-acl-status (90).

```
AcmePacket> show sipd acls
06:55:43-130

SIP ACL Status            -- Period -- -------- Lifetime --------
                  Active     High   Total       Total  PerMax     High
Total Entries          0        0       0           0       0        0
Trusted                0        0       0           0       0        0
Blocked                0        0       0           0       0        0

ACL Operations          ---- Lifetime ----
                  Recent       Total  PerMax
ACL Requests           0           0       0
Bad Messages           0           0       0
Promotions             0           0       0
Demotions              0           0       0
Trust->Untrust         0           0       0
Untrust->Deny          0           0       0
```

Parameter	Description
SIP ACL Status	
Total Entries	Total number of ACL entries, both trusted and blocked.
Trusted	Number of trusted ACL entries
Blocked	Number of blocked ACL entries
ACL Operations	
ACL Requests	Number of ACL requests
Bad Messages	Number of bad messages
Promotions	Total number of ACL entry promotions. These are the ACL entries that have been promoted from untrusted to trusted status.
Demotions	Number of ACL entry demotions.
Trust->Untrust	Number of ACL entries demoted from trusted to untrusted
Untrust->Deny	Number of ACL entries demoted from untrusted to deny

show sipd client

A SIP client can initiate and terminate SIP sessions. The "**show sipd client**" command displays statistics for SIP client events when the Net-Net SD is acting as a SIP client in its back-to-back User Agent (B2BUA) role. These statistics include SIP client information over Period and Lifetime monitoring spans, as well as information on active SIP client status. For associated HDR Group and Group Statistics, see Group: sip-client (92).

```
AcmePacket> show sipd client
08:17:59-166

SIP Client Trans          -- Period -- -------- Lifetime --------
                   Active     High   Total       Total  PerMax     High
All States             80       60      80         105      13        6
<Initial>               3        3       3          10      18        3
<Trying>               15       13      15          20      24       95
<Calling>              60       54      60          80      76       12
<Proceeding>           72       65      72          92      54        6
<Cancelled>             9        4       9          13       8        9
<EarlyMedia>            5        8       5          45       9       12
<Completed>            75       73      75          98      49       17
<SetMedia>             16        5      16          34      32       23
<Established>          79       60      79         101      13        2
<Terminated>            8        7       8           4       3        4
```

Parameter	Description
All States	Number of all client session transactions
Initial	Number of times the "Initial" state was entered due to the receipt of a request
Trying	Number of times the "Trying" state was entered due to the receipt of a request
Calling	Number of times the "Calling" state was entered due to the receipt of an INVITE request
Proceeding	Number of times the "Proceeding" state was entered due to the receipt of a provisional response while in the "Calling" state
Cancelled	Number of INVITE transactions that received a CANCEL
EarlyMedia	Number of times the "Proceeding" state was entered due to the receipt of a provisional response that contained a Session Description Protocol (SDP) while in the "Calling" state
Completed	Number of times that the "Completed" state was entered due to the receipt of a status code in the range of 300-699 when either in the "Calling" or "Proceeding" state
SetMedia	Number of transactions in which the Net-Net SD was setting up NAT and steering ports
Established	Number of times the client received a 2xx response to an INVITE, but could not forward it because the NAT and steering port information was missing
Terminated	Number of times the "Terminated" state was entered after a 2xx message

show sipd server

A SIP server can receive and terminate SIP sessions. The "**show sipd server**" command displays statistics for SIP server events when the Net-Net SD is acting as a SIP server in its back-to-back User Agent (B2BUA) role. These statistics include SIP server information over Period and Lifetime monitoring spans, as well as information on active SIP server status. For associated HDR Group and Group Statistics, see Group: sip-server (96).

```
AcmePacket> show sipd server
09:26:33-180

SIP Server Trans          -- Period -- -------- Lifetime --------
                  Active     High   Total       Total  PerMax     High
All States             0        0       0           0       0        0
<Initial>              0        0       0           0       0        0
<Queued>               0        0       0           0       0        0
<Trying>               0        0       0           0       0        0
<Proceeding>           0        0       0           0       0        0
<Cancelled>            0        0       0           0       0        0
<Established>          0        0       0           0       0        0
<Completed>            0        0       0           0       0        0
<Confirmed>            0        0       0           0       0        0
<Terminated>           0        0       0           0       0        0
```

Parameter	Description
All States	Number of all server session transactions
Initial	Number of times the "Initial" state was entered due to the receipt of a request
Queued	Number of times the "Queued" state was entered due to the receipt of a request
Trying	Number of times the "Trying" state was entered due to the receipt of a request
Proceeding	Number of times the "Proceeding" state was entered due to the receipt of a provisional response while in the "Calling" state
Cancelled	Number of INVITE transactions that received a CANCEL
Established	Number of times the server received a 2xx response to an INVITE, but could not forward it because the NAT and steering port information was missing
Completed	Number of times that the "Completed" state was entered due to the receipt of a status code in the range of 300-699 when either in the "Calling" or "Proceeding" state
Confirmed	Number of times that an ACK was received while the server was in "Completed" state, and then transitioned to the "Confirmed" state
Terminated	Number of times the "Terminated" state was entered after a 2xx message, or never received an ACK in the "Completed" state, and then transitioned to the "Terminated" state.

show sipd policy

Multistage local policy routing enables the Net-Net SD to perform multiple stages of route lookups where the result from one stage is used as the lookup key for the next routing stage.

The "**show sipd policy**" command displays single and multistage local policy lookups. All counters are reported for the recent, lifetime total, and lifetime maximum periods. For associated HDR Group and Group Statistics, see Group: sip-policy (100).

```
AcmePacket> show sipd policy
09:59:57-184
SIP Policy/Routing              ---- Lifetime ----
                        Recent      Total  PerMax
Local Policy Lookups         0          0       0
Local Policy Hits            0          0       0
Local Policy Misses          0          0       0
Local Policy Drops           0          0       0
Agent Group Hits             0          0       0
Agent Group Misses           0          0       0
No Routes Found              0          0       0
Missing Dialog               0          0       0
Inb SA Constraints           0          0       0
Outb SA Constraints          0          0       0
Inb REG SA Constraint        0          0       0
Out REG SA Constraint        0          0       0
Requests Challenged          0          0       0
Challenge Found              0          0       0
Challenge Not Found          0          0       0
Challenge Dropped            0          0       0
Local Policy Inits           0          0       0
Local Policy Results         0          0       0
Local Policy Exceeded        0          0       0
Local Policy Loops           0          0       0
```

Parameter	Description
Local Policy Lookups	Number of local policy lookups
Local Policy Hits	Number of successful local policy lookups
Local Policy Misses	Number of local policy lookup failures
Local Policy Drops	Number of local policy lookups where the next hop session agent group is H.323
Agent Group Hits	Number of successful local policy lookups for session agent groups
Agent Group Misses	Number of successful local policy lookups where no session agent was available for the session agent group
No Routes Found	Number of successful local policy lookups, but temporarily unable to route (for example, "session agent out of service")
Missing Dialog	Number of local policy lookups where the dialog was not found for a request addressed to the Net-Net SD with a "To" tag or for a NOTIFY-SUBSCRIBE SIP request
Inb SA Constraints	Number of successful local policy lookups where the inbound session agent (SA) exceeded constraints
Outb SA Constraints	Number of successful local policy lookups where the outbound SA exceeded constraints
Inb REG SA Constraint	Number of successful inbound local policy lookups where the registrar (REG) SA exceeded constraints
Outb REG SA Constraint	Number of successful outbound local policy lookups where the registrar (REG) SA exceeded constraints
Request Challenged	Number of requests that were challenged.
Challenge Found	Number of challenges found.
Challenge Not Found	Number of challenges not found.
Challenge Dropped	Number of challenges dropped.

Parameter	Description
Local Policy Inits	Number of times the Net-Net SD made an initial local policy lookup
Local Policy Results	Number of times the Net-Net SD truncated the number of routes returned for a local policy lookup because the maximum number of routes per local policy lookup (max local policy lookups routes per lookup) threshold was reached.
Local Policy Exceeded	Number of times the Net-Net SD truncated the number of routes returned for a local policy lookup because the maximum number of routes per message request (total local policy routes) threshold was reached.
Local Policy Loops	Number of times the Net-Net SD detected a loop while performing a multistage local policy lookup

show sipd errors

The "**show sipd errors**" command displays statistics for SIP media event errors. These statistics are errors encountered by the SIP application in processing SIP media sessions, dialogs, and session descriptions (SDP). Error statistics display for the lifetime monitoring span only. For associated HDR Group and Group Statistics, see Group: sip-errors (106).

```
AcmePacket> show sipd errors
04:58:16-183

SIP Errors/Events                ---- Lifetime ----
                          Recent       Total  PerMax
SDP Offer Errors               0           0       0
SDP Answer Errors              0           0       0
Drop Media Errors              0           0       0
Transaction Errors             0           0       0
Application Errors             0           0       0
Media Exp Events               0           0       0
Early Media Exps               0           0       0
Exp Media Drops                0           0       0
Expired Sessions               0           0       0
Multiple OK Drops              0           0       0
Multiple OK Terms              0           0       0
Media Failure Drops            0           0       0
Non-ACK 2xx Drops              0           0       0
Invalid Requests               0           0       0
Invalid Responses              0           0       0
Invalid Messages               0           0       0
CAC Session Drop               0           0       0
Nsep User Exceeded             0           0       0
Nsep SA   Exceeded             0           0       0
CAC BW Drop                    0           0       0
```

Parameter	Description
SDP Offer Errors	Number of errors encountered in setting up the media session for a session description in a SIP request or response which is a Session Description Protocol (SDP) Offer in the Offer/Answer model (RFC 3264)
SDP Answer Errors	Number of errors encountered in setting up the media session for a session description in a SIP request or response which is a Session Description Protocol (SDP) Answer in the Offer/Answer model (RFC 3264)
Drop Media Errors	Number of errors encountered in tearing down the media for a dialog or session that is being terminated due to: a) non-successful response to an INVITE transaction, or b) a BYE transaction received from one of the participants in a dialog/session, or c) a BYE initiated by the Net-Net SD due to a timeout notification from the Middlebox Control Daemon (MBCD).

Parameter	Description
Transaction Errors	Number of errors in continuing the processing of the SIP client transaction associated with setting up or tearing down of the media session.
Application Errors	Number of miscellaneous errors in the SIP application that are otherwise uncategorized
Media Exp Events	Number of flow timer expiration notifications received from the Middlebox Control Daemon (MBCD).
Early Media Exps	Number of flow timer expiration notifications received for media sessions that were not completely set up due to an incomplete or pending INVITE transaction
Exp Media Drops	Number of flow timer expiration notifications from the Middlebox Control Daemon (MBCD) that resulted in the termination of the dialog/session by the SIP application.
Expired Sessions	Number of sessions terminated due to the session timer expiring
Multiple OK Drops	Number of dialogs terminated upon reception of a 200 OK response from multiple User Agent Servers (UASs) for a given INVITE transaction that was forked by a downstream proxy
Multiple OK Terms	Number of dialogs terminated upon reception of a 200 OK response that conflicts with an existing established dialog on the Net-Net SD
Media Failure Drops	Number of dialogs terminated due to a failure in establishing the media session.
Non-Ack 2xx Drops	Number of sessions terminated because an ACK was not received for a 2xx response
Invalid Requests	Number of invalid requests (for example, an unsupported header was received).
Invalid Responses	Number of invalid responses (for example, no “Via” header in response)
Invalid Messages	Number of messages dropped due to parse failure
CAC Session Drop	Number of call admission control (CAC) session setup failures
CAC BW Drop	Number of call admission control (CAC) session setup failures due to insufficient bandwidth (BW)
Nsep User Exceeded	Number of Emergency Telecommunications Service (ETS), user call sessions that exceeded the calls-per-second rate configured on the Net-Net SD for National Security and Emergency Preparedness (NSEP).
Nsep SA Exceeded	Number of Emergency Telecommunications Service (ETS), Session Agent (SA) call sessions that exceeded the calls-per-second rate configured on the Net-Net SD for National Security and Emergency Preparedness (NSEP).

show sipd status

The "**show sipd status**" command displays information about Session Initiation Protocol (SIP) transactions. These statistics are given for the Period and Lifetime monitoring spans. This display also provides statistics related to SIP media events. These statistics include SIP status information over Period and Lifetime monitoring spans, as well as information on active SIP status. For associated HDR Group and Group Statistics, see Group: sip-status (113).

```
AcmePacket> show sipd status
09:05:20-106

SIP Status                -- Period -- -------- Lifetime --------
                   Active     High   Total       Total  PerMax     High
Sessions                0        0       0           0       0        0
Subscriptions           0        0       0           0       0        0
Dialogs                 0        0       0           0       0        0
CallID Map              0        0       0           0       0        0
Rejections              -        -       0           0       0
ReINVITEs               -        -       0           0       0
ReINV Suppress          -        -       0           0       0
Media Sessions          0        0       0           0       0        0
Media Pending           0        0       0           0       0        0
Client Trans            0        0       0           0       0        0
Server Trans            0        0       0           0       0        0
Resp Contexts           0        0       0           0       0        0
Saved Contexts          0        0       0           0       0        0
Sockets                 0        0       0           0       0        0
Req Dropped             -        -       0           0       0
DNS Trans               0        0       0           0       0        0
DNS Sockets             0        0       0           0       0        0
DNS Results             0        0       0           0       0        0
Rejected Msgs           0        0       0           0       0        0

Session Rate = 0.0
Load Rate = 0.1
Remaining Connections = 20000 (max 20000)
```

Parameter	Description
Sessions	Number of sessions established by INVITE and SUBSCRIBE messages
Subscriptions	Number of sessions established by SUBSCRIPTION
Dialogs	Number of end-to-end SIP signaling connections
CallID Map	Number of successful session header Call ID mappings
Rejections	Number of rejected INVITEs
ReINVITEs	Number of ReINVITEs
ReINV Suppress	Number of ReINVITEs that were suppressed
Media Sessions	Number of successful media sessions
Media Pending	Number of media sessions waiting to be established
Client Trans	Number of client transactions
Server Trans	Number of server transactions that have taken place on the Net-Net SD
Resp Contexts	Number of response contexts
Saved Contexts	Number of saved contexts
Sockets	Number of SIP sockets
Req Dropped	Number of dropped requests
DNS Trans	Number of Domain Name System (DNS) transactions
DNS Sockets	Number of Domain Name System (DNS) sockets
DNS Results	Number of Domain Name System (DNS) results
Rejected Msgs	Number of rejected messages
Session Rate	The rate, per second, of SIP invites allowed to or from the Net-Net SD during the sliding window period. The rate is computed every 10 seconds .

Parameter	Description
Load Rate	Average Central Processing Unit (CPU) utilization of the Net-Net SD during the current window. The average is computed every 10 seconds unless the load-limit is configured in the SIPConfig record, in which case it is 5 seconds.
Remaining Connections	Number of SIP connections currently available

show sipd invite

The "**show sipd invite**" command displays information about Session Initiation Protocol (SIP) INVITE requests. These statistics are given for both Server and Client and display recent, per maximum, and total for each. For associated HDR Group and Group Statistics, see Group: sip-invites (121).

```
AcmePacket> show sipd invite
09:05:20-106
INVITE (20:02:28-127)
                    --------- Server --------   --------- Client --------
Message/Event     Recent      Total  PerMax   Recent      Total  PerMax
                  ------  ---------  ------   ------  ---------  ------
INVITE Requests        0          0       0        0          0       0
Retransmissions        0          0       0        0          0       0
Response Retrans       0          0       0        0          0       0
Transaction Timeouts   -          -       -        0          0       0
Locally Throttled      -          -       -        0          0       0

Avg Latency=0.000 for 0
Max Latency=0.000
```

Parameter	Description
INVITE Requests	Number of INVITE requests
Retransmissions	Number of retransmissions of INVITEs
Response Retrans	Number of response retransmissions
Transaction Timeouts	Number of INVITE request transaction timeouts
Locally Throttled	Number of INVITE requests locally throttled
Avg Latency	Average latency of traffic flow for inbound and outbound packets
Max Latency	Maximum latency of traffic flow for inbound and outbound packets.

show sipd realms

Realms are a logical distinction representing routes (or groups of routes) reachable by the Net-Net SBC and what kinds of resources and special functions apply to those routes. Realms are used as a basis for determining ingress and egress associations to network interfaces, which can reside in different VPNs. The ingress realm is determined by the signaling interface on which traffic arrives. The egress realm is determined by the following:

- Routing policy - Where the egress realm is determined in the session agent configuration or external address of a SIP-NAT
- Realm-bridging - As applied in the SIP-NAT configuration and H.323 stack configurations
- Third-party routing/redirect (i.e., SIP redirect or H.323 LCF) 170 Net-Net 4000

Realms can also be nested in order to form nested realm groups. Nested realms consist of separate realms that are arranged within a hierarchy to support network architectures that have separate backbone networks and VPNs for signaling and media.

The "**show sipd realms**" command displays information about sessions (both inbound and outbound), out of service sessions, early and successful sessions, and session registration information for realms. This information displays for Period and Lifetime monitoring spans, as well as for active sessions. For associated HDR Group and Group Statistics, see the Group: session-realm (61), and Group: registration-realm (123).

> **Note:** The following example shows the statistics for the realm name of "public".

```
AcmePacket#  public
15:23:54-47
Realm access() [In Service]
                                -- Period -- -------- Lifetime --------
                    Active     High   Total       Total  PerMax     High
Inbound Sessions         0        0       0           0       0        0
  Rate Exceeded          -        -       0           0       0        -
  Num Exceeded           -        -       0           0       0        -
  Burst Rate             0        0       0           0       0        0
  Reg Rate Exceeded      -        -       0           0       0        -
  Reg Burst Rate         0        0       0           0       0        0
Outbound Sessions        0        0       0           0       0        0
  Rate Exceeded          -        -       0           0       0        -
  Num Exceeded           -        -       0           0       0        -
  Burst Rate             0        0       0           0       0        0
  Reg Rate Exceeded      -        -       0           0       0        -
Local Contacts           2        2       0           2       2        2
HNT Entries              0        0       0           0       0        0
Non-HNT Entries          2        2       0           2       2        2
Subscriptions            0       42      23         112      48       48
Out of Service           -        -       0           0       0        -
Trans Timeout            0        0       0           0       0        0
Requests Sent            -        -      46         222      96        -
Requests Complete        -        -       0           0       0        -
Seizure                  -        -       0           0       0        -
Answer                   -        -       0           0       0        -
  ASR Exceeded           -        -       0           0       0        -
Requests Received        -        -      46         226      96        -
QoS Major Exceeded       -        -       0           0       0        -
QoS Critical Exceeded    -        -       0           0       0        -
```

```
Initial Registrations
  Total              0        0        0          0        0          0
  Successful         0        0        0          0        0          0
  Unsuccessful       0        0        0          0        0          0
Refresh Registrations
  Total              0        0        0          0        0          0
  Successful         0        0        0          0        0          0
  Unsuccessful       0        0        0          0        0          0
De-Registrations
  Total              0        0        0          0        0          0
  Successful         0        0        0          0        0          0
  Unsuccessful       0        0        0          0        0          0
```

Parameter	Description
Inbound Sessions	Total number of active inbound sessions during an Active and Lifetime period.
Rate Exceeded	Number of times session rate was exceeded for inbound SIP sessions on this realm.
Num Exceeded	Number of times time constraints were exceeded for inbound sessions.
Burst Rate	Number of times burst rate was exceeded for this realm on inbound SIP sessions.
Reg Rate Exceeded	Number of times the registration rate was exceeded for this realm on inbound SIP sessions.
Reg Burst Rate	Number of times the registration burst rate was exceeded for this realm on inbound SIP sessions.
Outbound Sessions	Total number of active outbound sessions during an Active and Lifetime period.
Rate Exceeded	Number of times session rate was exceeded for outbound SIP sessions on this realm.
Num Exceeded	Number of times time constraints were exceeded for outbound sessions.
Burst Rate	Number of times burst rate was exceeded for this realm on outbound SIP sessions.
Reg Rate Exceeded	Number of times the registration rate was exceeded for this realm on outbound SIP sessions.
Local Contacts	Number of contact entries in the registration cache.
HNT Entries	Number of hosted NAT traversal (HNT) contact entries that are behind a NAT device.
Non-HNT Entries	Number of contact entries that are not hosted NAT traversal that are behind a NAT device.
Subscriptions	Specifies the following: • Active Subscriptions: The current global count of active SIP subscriptions during Survivability. • Subscriptions PreMax: The maximum global count of SIP subscriptions initiated during any 100 second period since the last SBC re-boot, and during Survivability. • Subscriptions High: The maximum global count of active SIP subscriptions since the last SBC re-boot, and during Survivability.
Out of Service	Number of times this realm went out of service.
Trans Timeout	Number of transactions timed out for this realm.
Requests Sent	Number of requests sent via this realm.
Requests Complete	Number of requests that have been completed for this realm.
Seizure	Number of seizures that occurred on this realm.
Answer	Number of answered SIP sessions on this session agent.

Parameter	Description
ASR Exceeded	Number of times that Access Service Requests (ASRs) were exceeded on this realm.
Requests Received	Number of requests received on this realm.
QoS Major Exceeded	Number of times the major Rfactor threshold was exceeded during the sliding window period. The peg count provides counts of calls with different service classes that occur during intervals of frequency which reliability indicate the traffic load. R-factors are metrics in VoIP that use a formula to determine a numeric expression of voice quality.
QoS Critical Exceeded	Number of times the critical Rfactor threshold was exceeded during the sliding window period. Provides counts of calls with different service classes that occur during intervals of frequency which reliability indicate the traffic load. R-factors are metrics in VoIP that use a formula to determine a numeric expression of voice quality.
Latency	
Avg	Average amount of time between the moment the realm transmits a SIP packet and the moment it reaches its destination.
Max	Maximum amount of time between the moment the realm transmits a SIP packet and the moment it reaches its destination.
QoS R-Factor	
Avg	Average Quality of Service (QoS) factor observed during the current window period. Quality of service shapes traffic to provide different priority and level of performance to different data flows. R-factors are metrics in VoIP, that use a formula to take into account both user perceptions and the cumulative effect of equipment impairments to arrive at a numeric expression of voice quality. This statistic defines the call or transmission quality expressed as an R factor.
Max	Maximum Quality of Service (QoS) factor observed during the sliding window period. Quality of service shapes traffic to provide different priority and level of performance to different data flows. R-factors are metrics in VoIP that use a formula to determine a numeric expression of voice quality. This statistic defines the call or transmission quality expressed as an R factor.
Early Sessions	Indicates the number of early sessions for each realm. Each time the Net-Net SBC receives an INVITE on the ingress realm or the egress realm sends an INVITE request, a counter increments if the session is established with a 200 OK response. This counter also increments in sessions when there are no 18x responses (Ringing (180), Call is Being Forwarded (181), Queued (182), Session in Progress (183)), but a 200 OK is established. This counter represents the number of sessions that have reached the early dialog state or later.
Successful Sessions	Indicates the number of successful sessions for each realm. Successful sessions are when the Net-Net SBC receives a successful 200 OK response from an initial INVITE request. **Note**: This counter is NOT incremented for re-INVITES.
Initial Registrations	
Total	Total number of initial registrations. This counter is incremented once for each initial REGISTER message even when the REGISTER is challenged. This counter is based on ingress (received) messages only. **Note**: This counter is not incremented when registrations are challenged by the following response messages: • 401 (Unauthorized - user authentication required) • 407 (Proxy authentication required) • 423 (Interval too brief - expiration time of the resource is too short)
Successful	Number of successful initial registrations. This counter is incremented once for each successful initial registration with a 200 OK response. This counter is based on ingress (received) messages only.

Parameter	Description
Unsuccessful	Number of unsuccessful initial registrations. This counter is incremented once for each unsuccessful initial registration when the response to the initial REGISTER has a non-success status code. This counter is based on ingress (received) messages only. **Note**: This counter is not incremented when registrations are challenged by the following response messages: • 401 (Unauthorized - user authentication required) • 407 (Proxy authentication required) • 423 (Interval too brief - expiration time of the resource is too short)
Refresh Registrations	
Total	Total number of registrations that were refreshed. This counter is incremented once for every refresh registration. This counter is based on ingress (received) messages only.
Successful	Total number of registrations that were successfully refreshed. This counter is incremented once for each successful refresh registration. This counter is based on ingress (received) messages only.
Unsuccessful	Total number of registrations that were unsuccessfully refreshed. This counter is incremented once for each unsuccessful refresh registration. This counter is based on ingress (received) messages only.
De-Registrations	
Total	Total number of registrations that de-registered. This counter is incremented once for every de-registration. This counter is based on ingress (received) messages only. In the event a de-registration message is received on a realm that is different than that of the initial registration message, the de-registration counter for the ingress realm of that de-registration message is incremented.
Successful	Total number of registrations that successfully de-registered. This counter is incremented once for each successful de-registration. This counter is based on ingress (received) messages only. In the event a successful de-registration message is received on a realm that is different than that of the initial registration message, the de-registration counter for the ingress realm of that successful de-registration message is incremented.
Unsuccessful	Total number of registrations that unsuccessfully de-registered. This counter is incremented once for each unsuccessful de-registration. This counter is based on ingress (received) messages only. In the event an unsuccessful de-registration message is received on a realm that is different than that of the initial registration message, the de-registration counter for the ingress realm of that unsuccessful de-registration message is incremented.

show enum

Telephone Number Mapping (ENUM) is an IETF standard (RFC 2916) for mapping the public telephone number address space into the Domain Name System (DNS). It links a phone number to an Internet address that is published in the DNS system. This allows a number to be reachable anywhere via the best and cheapest route.

The "**show enum**" command displays information about the ENUM Agent. These statistics provide current information only. For associated HDR Group and Group Statistics, see Group: enum-stats (129).

```
AcmePacket> show enum
09:05:20-106
                --Queries----  --Successful--  --NotFound--  --Timed Out--
ENUM Agent      Current Total  Current Total  Current Total  Current Total
```

Parameter	Description
Enum Agent	Name of the ENUM Agent on the Net-Net SD.
Queries Total	Number of ENUM queries
Successful Total	Number of successful ENUM queries
Not Found Total	Number of ENUM queries returning a "not found"
Times Out Total	Number of ENUM query timeouts

show mgcp

The Media Gateway Control Protocol (MGCP) is an implementation of the MGCP architecture for controlling media gateways on Internet Protocol (IP) networks and the Public Switched Telephone Network (PSTN). It is used to establish, maintain, and terminate calls between two or more endpoints. The Net-Net SD provides MGCP/Network Call Signaling (NCS) Application Layer Gateway (ALG) functionality for MGCP/NCS messages between media gateways and media gateway controllers.

The "**show mgcp**" command displays information about MGCP. These statistics include MGCP information over Period and Lifetime monitoring spans, as well as information on active MGCP status. For associated HDR Group and Group Statistics, see Group: mgcp-state (131) and Group: mgcp-trans (135).

> **Note:** "MGCP Transaction" displays recent Lifetime monitoring information ONLY.

```
AcmePacket> show mgcp
07:59:50-177

State                      -- Period -- -------- Lifetime --------
                  Active    High   Total      Total  PerMax    High
MGCP Sessions          0       0       0          0       0       0
CA Endpoints           0       0       0          0       0       0
GW Endpoints           0       0       0          0       0       0
Media Sessions         0       0       0          0       0       0
Client Trans           0       0       0          0       0       0
Server Trans           0       0       0          0       0       0
Pending MBCD           0       0       0          0       0       0
MGCP ALGs              0       0       0          0       0       0
Free Map Ports         0       0       0          0       0       0
Used Map Ports         0       0       0          0       0       0


                      --------- Gateway --------- ------- Call Agent --------
MGCP Transactions           ---- Lifetime ----           ---- Lifetime ----
                     Recent      Total  PerMax   Recent      Total  PerMax
Requests received         0          0       0        0          0       0
Responses sent            0          0       0        0          0       0
Duplicates received       0          0       0        0          0       0
Requests sent             0          0       0        0          0       0
Responses received        0          0       0        0          0       0
Retransmissions sent      0          0       0        0          0       0
```

Parameter	Description
State	
MGCP Sessions	Number of MGCP sessions
CA Endpoints	Number of call agent (CA) endpoints
GW Endpoints	Number of gateway (GW) endpoints
Media Sessions	Number of media sessions
Client Trans	Number of client transactions
Server Trans	Number of server transactions
Pending MBCD	Number of pending media requests to the Middlebox Control Daemon (MBCD)
MGCP ALGs	Number of MGCP Application Layer Gateway (ALG) connections
Free Map Ports	Number of port maps (i.e., IP Ports) available
Used Map Ports	Number of port maps (i.e., IP Ports) allocated
MGCP Transactions	
Requests received	Number of requests received
Responses sent	Number of responses sent
Duplicates received	Number of duplicate requests received
Requests sent	Number of requests sent

Parameter	Description
Responses received	Number of responses received
Retransmissions sent	Number of retransmissions sent

show mgcp errors

The Media Gateway Control Protocol (MGCP) is an implementation of the MGCP architecture for controlling media gateways on Internet Protocol (IP) networks and the Public Switched Telephone Network (PSTN). It is used to establish, maintain, and terminate calls between two or more endpoints. The Net-Net SD provides MGCP/Network Call Signaling (NCS) Application Layer Gateway (ALG) functionality for MGCP/NCS messages between media gateways and media gateway controllers.

The "**show mgcp errors**" command displays information about MGCP media event errors. These statistics include MGCP error information over Lifetime monitoring spans only. For associated HDR Group and Group Statistics, see Group: mgcp-media-events (138).

```
AcmePacket> show mgcp errors
09:43:09-176

MGCP Media Events                ---- Lifetime ----
                          Recent      Total  PerMax
Calling SDP Errors             0          0       0
Called SDP Errors              0          0       0
Drop Media Errors              0          0       0
Transaction Errors             0          0       0
Application Errors             0          0       0
Media Exp Events               0          0       0
Early Media Exps               0          0       0
Exp Media Drops                0          0       0
```

Parameter	Description
Calling SDP Errors	Number of errors encountered in setting up the media session for a session description in a Request or Response which is a Session Description Protocol (SDP) Offer in the Offer/Answer model (RFC 3264)
Called SDP Errors	Number of errors encountered in setting up the media session for a session description in a Request or Response which is a Session Description Protocol (SDP) Answer in the Offer/Answer model (RFC 3264)
Drop Media Errors	Number of errors encountered in tearing down the media for a session that is being terminated
Transaction Errors	Number of errors in continuing the processing of the client transaction associated with the setting up or tearing down of the media session
Application Errors	Number of miscellaneous errors that are otherwise uncategorized
Media Exp Events	Number of flow timer expiration notifications received from Middlebox Control Daemon (MBCD).
Early Media Exps	Number of flow timer expiration notifications received for media sessions that have not been completely set up
Exp Media Drops	Number of flow timer expiration notifications from the Middlebox Control Daemon (MBCD) that resulted in the termination of the session

show mgcp acls

The Media Gateway Control Protocol (MGCP) is an implementation of the MGCP architecture for controlling media gateways on Internet Protocol (IP) networks and the Public Switched Telephone Network (PSTN). It is used to establish, maintain, and terminate calls between two or more endpoints. The Net-Net SD provides MGCP/Network Call Signaling (NCS) Application Layer Gateway (ALG) functionality for MGCP/NCS messages between media gateways and media gateway controllers.

The "**show mgcp acls**" command displays information about MGCP access control lists (ACLs). These statistics include MGCP ACL information over Period and Lifetime monitoring spans, as well as information on active MGCP ACL status. For associated HDR Group and Group Statistics, see Group: mgcp-acl (143).

> **Note:** "ACL Operations" displays recent Lifetime monitoring information ONLY.

```
AcmePacket> show mgcp acls
10:10:31-118

MGCP ACL Status           -- Period -- -------- Lifetime --------
                  Active    High   Total      Total  PerMax     High
Total Entries          0       0       0          0       0        0
Trusted                0       0       0          0       0        0
Blocked                0       0       0          0       0        0

ACL Operations         ---- Lifetime ----
                  Recent      Total  PerMax
ACL Requests           0          0       0
Bad Messages           0          0       0
Promotions             0          0       0
Demotions              0          0       0
Trust->Untrust         0          0       0
Untrust->Deny          0          0       0
```

Parameter	Description
MGCP ACL Status	
Total Entries	Total number of Access Control List (ACL) entries, both trusted and blocked
Trusted	Number of trusted ACL entries
Blocked	Number of blocked ACL entries
ACL Operations	
ACL Requests	Number of ACL requests
Bad Messages	Number of bad messages
Promotions	Number of ACL entry promotions. These are the ACL entries that have been promoted from untrusted to trusted status
Demotions	Number of ACL entry demotions. These are the ACL entries that have been demoted from trusted to untrusted.
Trust->Untrust	Number of ACL entries demoted from trusted to untrusted
Untrust->Deny	Number of ACL entries demoted from untrusted to deny

show h323

H.323 is a recommendation from the ITU Telecommunication Standardization Sector (ITU-T) that defines the protocols to provide audio-visual communication sessions on any packet network. H.323 addresses call signaling and control, multimedia transport and control, and bandwidth control for point-to-point and multi-point calls. The Net-Net SD responds to and forwards H.323 signaling messages and sets up H.323 sessions based on the Net-Net system configuration.

The "**show h323**" command displays information about H323 operations. These statistics include H323 information over Period and Lifetime monitoring spans, as well as information on active H323 status. For associated HDR Group and Group Statistics, see Group: h323-stats (145).

> **Note:** "H323D Status" displays recent Lifetime monitoring information ONLY.

```
AcmePacket> show h323
10:36:07-94

Session Stats                          -- Period --  -------- Lifetime -------
                              Active    High   Total      Total  PerMax    High
Incoming Calls                     0       0       0          0       0       0
Outgoing Calls                     0       0       0          0       0       0
Connected Calls                    0       0       0          0       0       0
Incoming Channels                  0       0       0          0       0       0
Outgoing Channels                  0       0       0          0       0       0
Contexts                           0       0       0          0       0       0

H323D Status     Current   Lifetime
Queued Messages        0          0
TPKT Channels          0          0
UDP Channels           0          0

Load Rate = 0.2
```

Parameter	Description
Session Stats	
Incoming Calls	Number of incoming H.323 calls
Outgoing Calls	Number of outgoing H.323 calls
Connected Calls	Number of connected calls
Incoming Channels	Number of established incoming calls
Outgoing Channels	Number of established outgoing channels
Contexts	Number of established H.323 contexts (or call terminations)
H323D Status	
Queued Messages	Number of messages queued
TPKT Channels	Number of ThroughPacket (TPKT) channels open(ed)
UDP Channels	Number of User Datagram Protocol (UDP) channels open(ed)
Load Rate	Total H323 current load rate, in seconds, on the Net-Net SD

A CSV File Data Formats

Introduction

When enabled, the HDR collector transmits data to a Comma-Separated-Value (CSV) file. The format of the HDR data in the CSV file is dependant on the type of Group Statistics in the file and the method used to open the file. This appendix describes the data formats of the HDR data in the CSV file.

Methods for Display and Format of CSV File Contents

The HDR collector transmits data to a CSV file in standard format. Each file is formatted as *<Unix timestam*p*>.csv* (for example, *1302041977.csv*). Within the file, each record also has an associated record timestamp. The **filename timestamp** is the time that the CSV file was create. The **record timestamp** is the window of time that the HDR collector used to collect the data. For more information on windows of time, see Windows of Time (40).

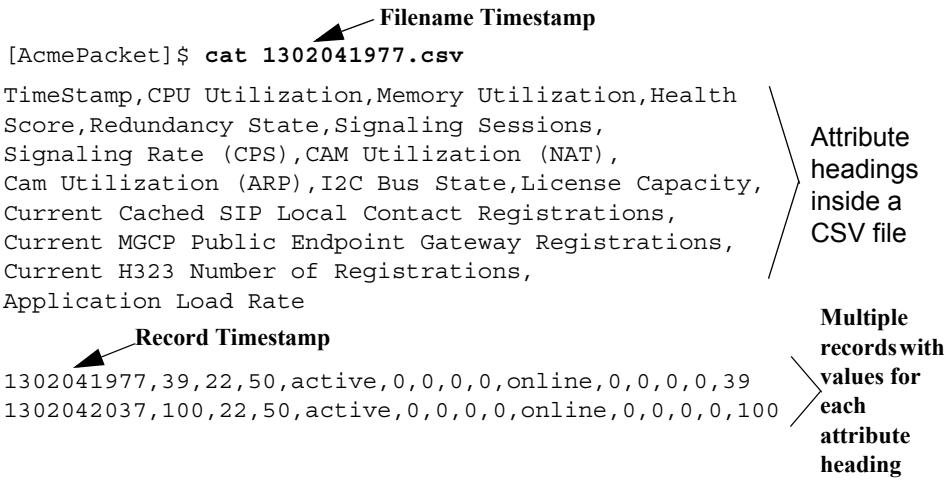
When the HDR collector has created a CSV file, you can open the file in any of the following ways:

- using the UNIX command "**cat <timestamp>.csv**" at the UNIX root prompt (displays raw data)
- using the Microsoft command "**type <timestamp>.csv**" at a Microsoft® Windows DOS command prompt (displays raw data)
- using a rendering agent application (such as a Microsoft® application)

The following examples show each of these methods.

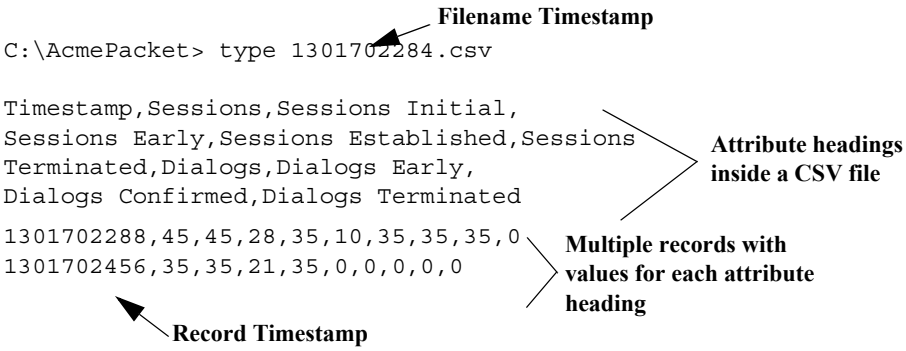
Example 1 - Using the UNIX Command

The following shows the use of the "**cat <timestamp>.csv**" UNIX command to display the contents of a "system" group CSV file in raw data format.



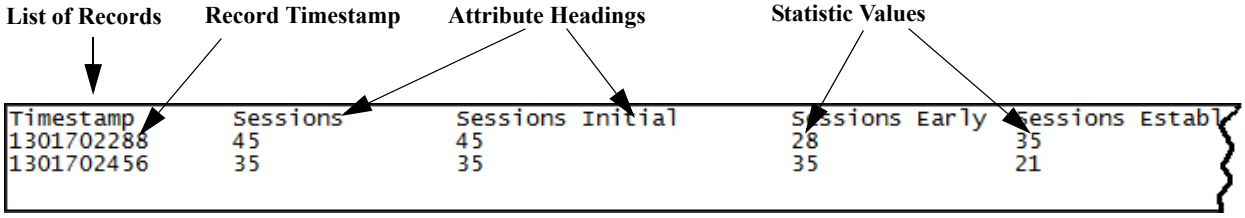
Example 2 - Using the DOS Command

The following shows the use of the "**type <timestamp>.csv**" Microsoft® Windows DOS command to display the contents of a "sip-sessions" group CSV file in raw data format.



Example 3 - Using a Rendering Agent

The following shows the use of a rendering agent (a Microsoft application) to display the contents of a "sip-sessions" group CSV file in table format.



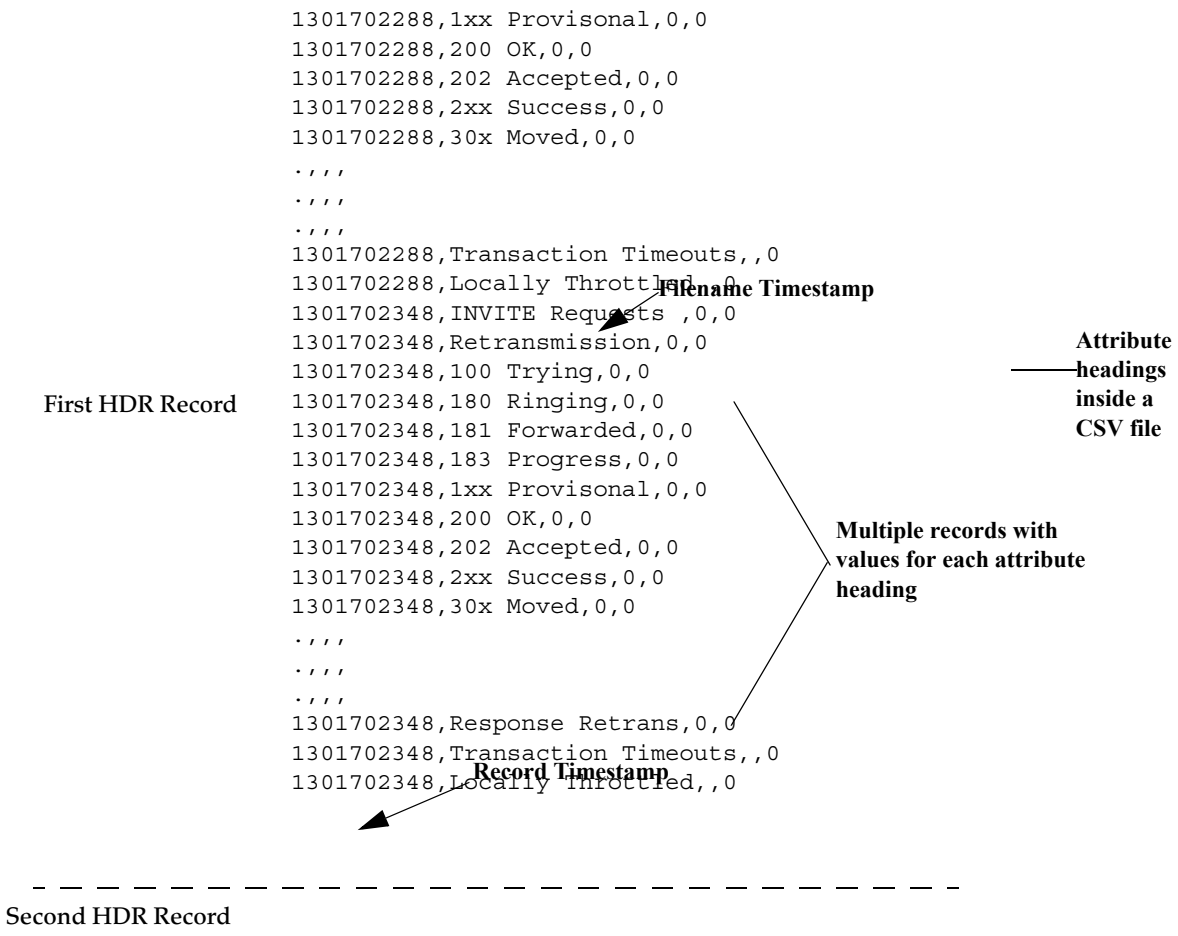
The formats in the examples above pertain to **ALL** of the HDR groups specified in HDR Groups and Group Statistics (39) **EXCEPT** the "**sip-invite**" Group. For information on the "sip-invite" HDR data format in the CSV file, see the next section.

"Sip-invite" Format of HDR Data in CSV File

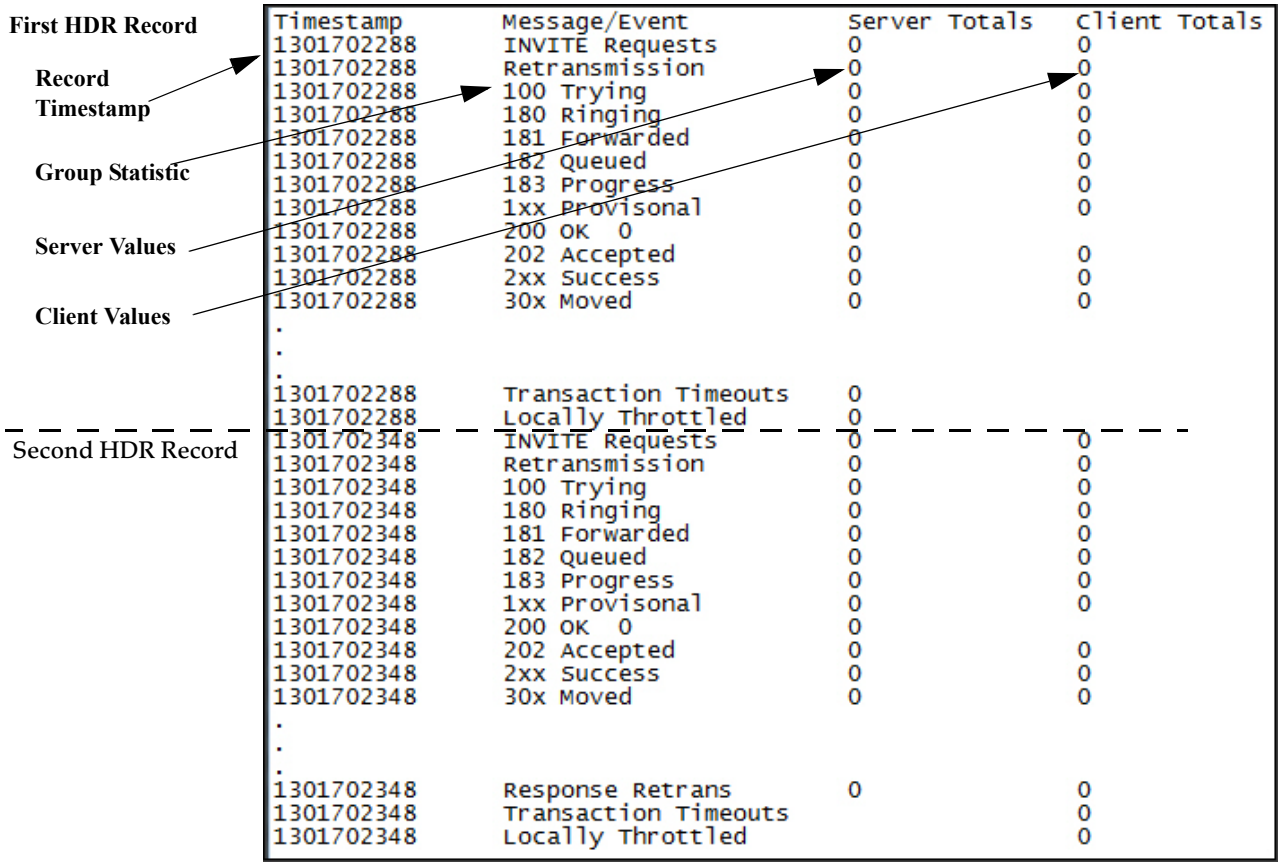
The HDR data for the "sip-invite" group displays on mutiple lines in the CSV file. The first HDR record displays the list of statistics in column format. The second HDR record also displays statistics in column format, and so on. Both client and server totals are included in the data.

The following shows an example of the "sip-invite" group CSV file for a client and a server displayed in a Microsoft DOS window format.

```
C:\AcmePacket> type 130204198.csv
Timestamp,Message/Event,Server Totals,Client Totals
1301702288,INVITE Requests ,0,0
1301702288,Retransmission,0,0
1301702288,100 Trying,0,0
1301702288,180 Ringing,0,0
1301702288,181 Forwarded,0,0
1301702288,183 Progress,0,0
```


1301702288,1xx Provisonal,0,0
1301702288,200 OK,0,0
1301702288,202 Accepted,0,0
1301702288,2xx Success,0,0
1301702288,30x Moved,0,0
.,,,
.,,,
.,,,
1301702288,Transaction Timeouts,,0
1301702288,Locally Throttled ,0
1301702348,INVITE Requests ,0,0
1301702348,Retransmission,0,0
1301702348,100 Trying,0,0
1301702348,180 Ringing,0,0
1301702348,181 Forwarded,0,0
1301702348,183 Progress,0,0
1301702348,1xx Provisonal,0,0
1301702348,200 OK,0,0
1301702348,202 Accepted,0,0
1301702348,2xx Success,0,0
1301702348,30x Moved,0,0
.,,,
.,,,
.,,,
1301702348,Response Retrans,0,0
1301702348,Transaction Timeouts,,0
1301702348,Locally Throttled,,0
Filename Timestamp
Attribute headings inside a CSV file
First HDR Record
Multiple records with values for each attribute heading
Record Timestamp
Second HDR Record

The following shows an example of the "sip-invite" group CSV file for a client and a server displayed in a Microsoft rendering application format.



Timestamp	Message/Event	Server Totals	Client Totals
1301702288	INVITE Requests	0	0
1301702288	Retransmission	0	0
1301702288	100 Trying	0	0
1301702288	180 Ringing	0	0
1301702288	181 Forwarded	0	0
1301702288	182 Queued	0	0
1301702288	183 Progress	0	0
1301702288	1xx Provisonal	0	0
1301702288	200 OK 0	0	
1301702288	202 Accepted	0	0
1301702288	2xx Success	0	0
1301702288	30x Moved	0	0
.			
.			
.			
1301702288	Transaction Timeouts	0	
1301702288	Locally Throttled	0	
1301702348	INVITE Requests	0	0
1301702348	Retransmission	0	0
1301702348	100 Trying	0	0
1301702348	180 Ringing	0	0
1301702348	181 Forwarded	0	0
1301702348	182 Queued	0	0
1301702348	183 Progress	0	0
1301702348	1xx Provisonal	0	0
1301702348	200 OK 0	0	
1301702348	202 Accepted	0	0
1301702348	2xx Success	0	0
1301702348	30x Moved	0	0
.			
.			
.			
1301702348	Response Retrans	0	0
1301702348	Transaction Timeouts		0
1301702348	Locally Throttled		0

Data Caveats

For those who wish to extract data from HDR CSVs, please note the following:

- Although SNMP presents enumerated fields as integers, HDR translates this data presenting the applicable string in the CSV.
- In some cases, no data is available for a given record. An example of this is a record for an agent that is out of service during the collection window. For these cases, HDR presents only the timestamp and a single field indicating that no data is available, as shown below.

```
enum-stats:
TimeStamp,ENUM Agent,Queries Total,Successful Total,Not Found
Total,Timeout Total
1314110727,no data available
```