Net-Net® 9000 Release Notes

Release Version S-D7.1.0

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Notices

About this Guide

Overview

The *Net-Net 9000 S-D7.1.0 Release Notes* provide:

- An overview of new application features
- An overview of new management features
- A summary of ACLI changes
- A summary of MIB changes
- A summary of Documentation Set changes
- A summary of changes in each Maintenance Release

Who is Acme Packet?

Acme Packet enables service providers to deliver trusted, first class interactive communications-voice, video and multimedia sessions-across IP network borders. Our Net-Net family of session border controllers satisfy critical security, service assurance and regulatory requirements in wireline, cable and wireless networks. Our deployments support multiple applications-from VoIP trunking to hosted enterprise and residential services; multiple protocols-SIP, H.323, MGCP/NCS and H.248; and multiple border points-interconnect, access network and data center.

Established in August, 2000 by networking industry veterans, Acme Packet is a public company traded on the NASDAQ and headquartered in Burlington, MA.

Customer Questions, Comments, or Suggestions

Acme Packet is committed to providing our customers with reliable documentation. If you have any questions, comments, or suggestions regarding our documentation, please contact your Acme Packet customer support representative directly or email support@acmepacket.com.

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Revision History

This section contains a revision history for this document.

Date	Revision Number	Description
October 25, 2010	Revision 1.00	• Initial Release
September 18, 2012	Revision 1.01	• Adding HDR limitation to Known Issues section of this document.
May 13, 2013	Revision 1.02	• Added more detail to HDR limitation.

Version S-D7.1.0Contents

Net-Net OS S-D7.1.0 Release Notes

Introduction

The Net-Net OS S-D7.1.0 Release Notes provide the following information about Net-Net OS Release S-D7.1.0:

- A summary of changes in each Maintenance Release
- An overview of the new features available
- An overview of the management enhancements
- An overview of the accounting enhancements
- A summary of changes to the Acme Packet Command Line Interface (ACLI)
- A summary of known issues

Net-Net OS S-D7.1.0 Upgrade Prerequisites

Caution: The bootloader MUST be upgraded to bootloader package SWR-0012-00r2p03.tar prior to loading any Net-Net OS version S-D7.1.0 image/baseline of nnSD710b4 or later on the Net-Net 9000. This bootloader is backward compatible to all D600, D700, D710b3 or earlier images.

After upgrading the bootloader, on the next reboot the new bootloader will be running. This can be verified with the **show version hardware** command.

For X86 processors (SPU2/NPU2) the bootloader should be dated:

```
Slot   Cpu    Core   Boot Loader Rev CPLD1 Rev   CPLD2 Rev   Memory Size
0      0      0      09/27/2010      2.0.1       2.0.2       3029MB
```

For MIPS processors (SPU1/NPU1/TCU1) the bootloader should be dated:

```
Slot   Cpu    Core   Boot Loader Rev CPLD1 Rev   CPLD2 Rev   Memory Size
2      0      0      09/27/2010      c.3.2       Unknown     1024MB
```

Caution: It is advised to upload NN9200 Diagnostic Image SWR-0016-00, Rev 2.05 (filename: nnD_diags205.tar) or greater to the Net-Net 9200's /code/images directory before upgrading the bootloader. Older diagnostics images will not work with the 09/27/2010 bootloader.

Maintenance Release Content

Net-Net OS S-D7.1.0 at current GA release rolls up all features through Net-Net OS S-D7.0.0m7. Please refer to the Net-Net 9000 Release Notes Release Version S-D7.0.0 for information about maintenance release features.

Net-Net OS S-D7.1.0 at current GA release rolls up all fixes through Net-Net OS S-D7.0.0m7p2.

Overview of New Features for Release S-D7.1.0

This section describes features and capabilities introduced in Acme Packet's Net-Net OS Release S-D7.1.0.

IMS Features

This section describes the addition to IMS support.

Recurse on 305 Only

For IMS deployments, you can enable the Net-Net SBC to recurse on a 305 (Use proxy) message. Upon receiving all other 3xx messages, the Net-Net SBC will not recurse and will send a 3xx SIP response back to the sender.

RTN: 1809

Resource and Admission Control

This section describes the additions to resource and admission control functionality.

Bandwidth CAC for Aggregate Emergency Sessions

You can configure the maximum amount of bandwidth on your Net-Net SBC you want used specifically for priority (emergency) calls in the realm configuration's **max-priority-bandwidth** parameter. You set this limit on a per-realm basis, and the limit is enforced for nested realms. Setting a bandwidth limit specifically for priority calls allows the Net-Net SBC to reject calls exceeding the threshold, and also to accept calls that exceed the bandwidth limit for non-priority calls (set in the **max-bandwidth** parameter).

Media Profiles per Realm

For different codecs and media types, you can set up customized media profiles that serve the following purposes:

- Police media values
- Define media bandwidth policies
- Support H.323 slow-start to fast-start interworking

You can use media policies globally for the Net-Net SBC, or you can configure them for application on a per-realm basis. For a realm, you can configure a list of media profiles you want applied. The Net-Net SBC matches the media profiles values you configure for a realm, and then it applies those media profiles to the realm itself and to all of its child realms (but not to its parent realms).

RTN: 2173

Bandwidth CAC for Media Release

The bandwidth CAC for media release feature adds per-realm configuration that determines whether or not to include inter-realm calls in bandwidth calculations. When you use this feature, the Net-Net SBC's behavior is to count and subtract

bandwidth from the used bandwidth for a realm when a call within a single site has its media released. When you do not enable this feature (and the Net-Net SBC's previous behavior), the Net-Net does not subtract the amount of bandwidth.

RTN: 1487

DCSP Marking

This feature resolves ToS issues such as when a customer needs to differentiate between TV-phone and video streaming. While both TV-phone and video streaming have the attribute "media=video," TV-phone streaming has "direction=sendrcv" prioritized at a high level and video has "direction=sendonly or recvonly" with middle level priority. The Net-Net SBC can provide the appropriate marking required to differentiate the types of traffic.

RTN: 982

External Policy Servers

This section describes additions to External Policy Servers features.

Diameter Heartbeat

Device-Watchdog-Request (DWR) and Device-Watchdog-Answer (DWA) messages are used to detect transport failures at the application layer between the Net-Net SBC communicating with a policy server via Diameter. The request/answer message pair forms a heartbeat mechanism that can alert the requesting side if the answering side is not reachable.

The Net-Net SBC always responds to a DWR by replying with a DWA message. In addition, the Net-Net SBC can be configured to initiate DWR messages toward a policy server or other Diameter-based network device.

You configure the **watchdog ka timer** with a timeout value that determines the number of seconds a DWA is expected in response to the Net-Net SBC sending a DWR.

RTN: 1784

Diameter Destination Realm AVP

The Destination Realm AVP's value does not contain the realm of the incoming SIP message. Now, it contains the realm where the Policy Server resides as learned from the Origin-Realm AVP received in a CEA message from the Policy Server. The Net-Net SBC can be configured with an option to retain the previous behavior of sending an incoming SIP message's realm to a policy server.

RTN:1785

Multi-tiered Policy Server Support

In customer networks with a two tier Policy Server structure, it can be desirable to have the Tier-1 PS run in a stateless mode in order to increment the performance of devices in that role. The Net-Net SBC can recall the Origin-Host-AVP value returned in the initial AAA response to the Diameter session establishment query to operate with a stateless tier 1 server.

RTN: 2248

HDR Support for Existing Statistics

Historical data recording (HDR) support includes data for External Policy Servers statistics using Diameter.

RTN: 2133

SNMP Trap on Policy Server Connection Failure

When the Net-Net 9200 is deployed to act as a P-CSCF between the core IMS network and UEs, and connection to an external policy server goes down, or an attempt is unsuccessful, the Net-Net SBC generates an SNMP trap.

RTN: 2182

Diameter Policy Server High Availability

The Net-Net SBC can provide external policy server redundancy through a combination of multiple servers being returned in one FQDN query and maintaining state of these servers.

RTN: 2183

Using FQDNs for Policy Server Addresses

An external policy servers' address can be configured as an FQDN in addition to an IP address.

RTN: 2183

SIP Features

This section describes additions to SIP signaling features.

Early media Thru-connect Prevention

Early media suppression lets you determine who can send early media and in what direction. With early media suppression, you can block early media until the call is established. Early media are the RTP/RTCP packets sent from the called party to the caller, or vice versa, before a session is fully established (before a 200 OK is received).

RTN: 1821/1822

This feature (1821) has not yet completed testing.

Peer-to-Peer MSRP TCP Stitching

The Net-Net SBC supports peer-to-peer TCP connections for peers behind NATs, enabling Message Session Relay Protocol (MSRP) client to communicate with one another. More specifically, the Net-Net SBC can:

- Establish incoming TCP connections with each endpoint participating in the MSRP session using a 3-way handshake. The Net-Net SBC receives incoming SYNs on the local address and port provided in the SDP offer and answer to each endpoint.
- Stitch together the two TCP connections internally after successful establishment of both connections. This capability is used when the caller and the callee initiate TCP SYNs towards one another via the Net-Net SBC; the “stitching” makes both clients think they are talking to a server. To achieve this end, the Net-Net SBC caches SYNs from both sides so it can modify the SYN packets to SYN-Acks with the correct sequence and Ack numbers.

  Note, though this case is rare, that if a user is behind a NAT offers a=passive, then this feature cannot function properly.
- Relay MSRP stream between the endpoints.
- Police bandwidth for MSRP streams based on a defined media profile for MSRP.

RTN: 1961

Wildcarded PUID in P-Associated-URI

In the IMS core, a PBX often registers its own base telephone number with the S-CSCF, and the S-CSCF obtains a wildcarded public user identity, represented by a regular expression that describes all extension numbers associated with the registering PBX.

The S-CSCF includes the wildcarded puid in the 200OK response to the REGISTER message that the Net-Net SBC sent it, prompted by the initial registering endpoint. Upon receiving the 200OK, the Net-Net SBC uses the wildcarded puid to implicitly treat subsequent INVITEs from PBXs extensions that match the wildcard as registered endpoints.

For all calls directed at telephone numbers that are implicitly registered by the wildcarded puid regular expression, the Net-Net SBC terminates them on the servicing PBX.

RTN: 1926

SIP Diversion to SIP-ISUP Interworking

For networks in which there are devices that do not support SIP-T or SIP-I (and support native SIP alone), the Net-SBC now supports SIP Diversion interworking. This feature enables such devices to function properly in instances that require SIP-T/SIP-I style ISUP IAM message encapsulation in ISUP requests, and to receive any call forwarding information in the IAM according to ISUP standards.

The Net-Net SBC interworks a native SIP INVITE request to SIP-T one by inserting an ISUP IAM body based on the INVITE; this includes redirection information based on the Diversion header. This feature can also perform the reverse translation. That is, it can interwork a SIP INVITE that does have the ISUP IAM body to a non-ISUP INVITE. In this case, the Net-Net SBC generates the necessary Diversion headers based on the IAM's Redirection information.

RTN: 1845

SIP-ISUP Format Version Interworking

An ISUP message can be carried in SIP messages through either a standard body or through a multipart MIME encoded body. While ANSI and ITU are the two major groups, but each contains many specific variants. To facilitate instances where two sides of a call use different versions, the Net-Net SBC supports interworking between the following SIP ISUP formats: ANSI, ITU, ETSI-356 (an ITU variant), and GR-317 (an ANSI variant). To do so, the Net-Net SBC can move, delete, and add parameters to various sections of the message.

RTN: 1838

Dialog-Matching Header Manipulation

The most common headers to manipulate using HMR are the To-URI and From-URI. Along with the to-tag, from-tag, and Call-ID values, these are also all headers that represent dialog-specific information that must match the UAC and UAS to be considered part of the same dialog. If these parameters are modified through HMR, the results can be that the UAC or UAS rejects messages.

While it is possible to ensure that dialog parameters match correctly using regular HMR, this feature offers a simpler and less error-prone method of doing so.

RTN: 1844

HMR for SIP-ISUP

The Net-Net SBC's HMR functionality can operate on ISDN user party (ISUP) binary bodies. Using the same logic and mechanisms that are applied to SIP header

elements, HMR for SIP-ISUP manipulates ISUP parameter fields and ISUP message parts. You can create MIME rules that function in much the same way the SIP header rules do; but whereas SIP header rules can change the specific headers of a SIP message, MIME rules can manipulate targeted body parts of a SIP message.

In addition, this feature also introduces:

- Changes and additions to equality operators—These changes are detailed in the *SIP Signaling Services* chapter of the *Net-Net 9000 ACLI Configuration Guide*.

Reserved words—To improve system performance and simplify configuration, the Net-Net SBC now supports pre-defined reserved words for commonly-used URI parameters for HMR. Reserved words retrieve values directly from the SIP message, without your needing to create rules to store them.

RTN: 1837

SIP maddr Resolution

This release provides enhanced resolution of addresses found in SIP contact headers, or in the *maddr* (multicast address) parameter of SIP 3xx REDIRECT messages. Previous releases resolved these addresses as either a host address or as a session agent name. With this release, these addresses can also be resolved as session agent group (SAG) names.

RTN: 1800

Full Via Header Replacement

In the basic behavior of the SIP VIA Header Transparency feature, the Net-Net SBC retains the top-most VIA header received on ingress and places it under the VIA header containing the system's address on egress. All VIA headers beneath the top-most header in the ingress message are lost.

The Net-Net SBC can also retain all VIA headers received on the message's ingress. Thus the top-most VIA header becomes the second VIA header on egress, the second VIA header becomes the third VIA header on egress, and so on.

RTN: 1648

NSEP Enhancements

This group of NSEP enhancements covers:

- The ability to configure and monitor NSEP call admission control (CAC) as applied to session agents
- Call treatment when the Net-Net SBC receives a SIP INVITE with and RPH matching the network management controls (NMC) with an ETS DN, but whose r-values do not match the NMC's rph-profile
- Log level changes for instances when users or session agents exceed constraints

RTN: 1546

Adaptive HNT

The adaptive HNT expires feature allows the Net-Net SBC to automatically determine the maximum SIP REGISTER message expires time interval in order to keep each individual NAT pinhole open when performing SIP HNT.

RTN: 1530

H.323 Features

This section describes additions to H.323 signaling features.

cpntype options for H.323 Calls

In previous Net-Net SBC releases, SIP to H.323 IWF calls default to a National Q.931 Number Type and it is not possible to change it to an International number. This feature allows you to override that behavior by configuring the option **cpnType=X**, where X is an integer that maps to various Q.931 Number Types. When this option is set, Q.931 Number Type for both calling party and called party are updated to the configured value for all outgoing calls on the h323-stack.

RTN: 1792

SIP/H.323 Common Features

This section describes features that apply to both SIP and H.323.

Expedited Call Leg Release for Preempted Hairpin Calls

When hairpinned calls are ended because of signaling failures (such as a SIP mid-dialog signaling timeout, or an H.323 TCP keepalive failure) on one call leg, the Net-Net SBC deletes both legs' media flows simultaneously by default.

Caution

This feature introduces a new default behavior compared to previous releases.

RTN: 1815 / 1817

Expedited Media Termination of Calls with Abnormal Signaling Termination

The Net-Net SBC can close the remote call leg's media session as it forwards the BYE message to the remote endpoint, and not wait any further.

RTN: 1818 / 1819

Cause Code Completeness

This feature updates the reporting of cause codes associated with various H.323 scenarios. This feature also updates the reporting of various CDR statistics for SIP scenarios.

RTN: 2250

Throttled Call Teardown to/from Session Agent

You can configure the Net-Net SBC to explicitly tear down all calls associated with a session agent when it goes OOS. To mitigate any exceptionally high CPU load placed on the Net-Net SBC when it tears down all calls associated with the downed SA, internal processes will throttle the tear-down rate commiserate with the CPU load.

RTN: 1823/1824

This feature (1824) has not yet completed testing.

Session Routing and Load Balancing

This section describes additions to routing and load balancing functionality.

DNS Transaction Timeout

To provide resiliency during DNS server failover, you can now enable a transaction timeout for DNS servers. If you have endpoints that are only capable of being configured with a single DNS server, this can allow DNS queries to be sent to the next configured server—even when contacting the Net-Net SBC's DNS ALG on a single IP address. So when the first server in the list times out, the request is sent to the next server in the list.

RTN: 1795

Multi-Stage Local Policy Routing for SIP

In previous releases, the Net-Net SBC provides a single-stage local policy routing mechanism, meaning that it performs a single local policy look-up when routing SIP traffic. This look-up can result in multiple matching routes. Then the Net-Net SBC tries the matching routes in order of preference, either hitting a terminate-recursion or trying until none is left. With ENUM or local routing table (LRT) entries defined as the next hop, the Net-Net SBC queries the ENUM server or consults the local routing table. Then it uses the results to perform routing based on the hostname in the NAPTR or LRT next hop entries. If all of those fail, the system then tries the next matching local policy results.

By contrast, multi-stage local policy routing provides a mechanism whereby you can configure the Net-Net SBC to use multiple stages of route look-ups, where the result from one stage can be used as the look-up key for the next.

RTN: 1842

ENUM Failover and Query Distribution

- ENUM query distribution—The Net-Net SBC can intelligently distribute ENUM queries among all configured ENUM servers. By setting the enum-config's **query-method** parameter to **round-robin**, the Net-Net SBC will cycle ENUM queries, sequentially, among all configured ENUM servers. For example, query 1 will be directed to server 1, query 2 will be directed to server 2, query 3 will be directed to server 3, and so on.

  The default query method, **hunt**, directs all ENUM queries toward the first configured ENUM server. If the first server is unreachable, the Net-Net SBC directs all ENUM queries toward the next configured ENUM server, and so on.

- Failover to new enum-config—When an enum-config's configured servers are unreachable via the network (i.e., no response is received on a query), the Net-Net SBC can failover to a defined ENUM config that contains different ENUM servers to query. This failover behavior works when all servers in an ENUM config are unreachable, rather than when the Net-Net SBC receives not-found type responses.

RTN: 1805

Caching ENUM Responses (NAPTR Support)

As DNS responses often lead to further DNS queries, a DNS server can send multiple records in a response to attempt to anticipate the need for additional queries. The Net-Net SBC can locally cache additional NAPRT, SRV, and A records returned from an ENUM query to eliminate the need for unnecessary external DNS requests. The Net-Net SBC can then refer to these cached records.

RTN: 1803

Source URI Information in ENUM Requests

ENUM queries can include the source URI that caused the ENUM request. The Net-Net SBC can add the P-Asserted-ID URI (only if not in an INVITE) or the From URI into an OPT-RR Additional Record to be sent to the ENUM server. It can be useful

to specify the originating SIP or TEL URI from a SIP request that triggered the ENUM query, so the ENUM server can provide a customized response based on the caller.

This feature implements the functionality described in the Internet Draft, *DNS Extension for ENUM Source-URI*, draft-kaplan-enum-source-uri-00.

RTN: 1802

SIP Session Agent DNS-SRV Load Balancing

In previous releases the Net-Net SBC provided the ability to specify a fully qualified domain name (FQDN) for a destination session-agent. During DNS lookup the FQDN could resolve to multiple resource record for servers (SRV) records. Each SRV could resolve to a single IP address via A-Record query in IMS or DNS.

With this release, the Net-Net SBC supports load balancing behavior as described in RFC 3263, *Session Initiation Protocol (SIP): Locating SIP Servers*. It supports internal load balancing, and monitors the availability of dynamically resolved IP addresses obtained from a DNS server. Then the Net-Net SBC can recurse through the list of in-service IP addresses. It also support the selection of routing destinations based on SRV weights.

RTN: 1798

Local Policy: DTMF-Style URI Routing

This release supports the alphanumeric characters a-d, A-D, the asterisk (*), and the ampersand (#) for local policy matching purposes. The Net-Net SBC handles these characters as standards DN (POTS) or FQDN when found in the **to-addr** (req-uri username) or **from-addr** (from-uri username for SIP, SIPS, and TEL URIs. In addition, before performing the lookup match, the Net-Net SBC strips characters that provide ease-of-reading separation. For example, if the Net-Net SBC were to receive a req-uri containing `tel:a-#1-781-328-5555`, it would treat it as `tel:a#17813285555`.

RTN: 1534

Custom ENUM Service Type Support

You can configure the ENUM service type that you want to use for an ENUM group. The Net-Net SBC has always supported `E2U+sip` and `sip+E2U` by default, and still does. With Release S-C6.1.0, however, you are also able to configure the service type to those supported in RFCs 2916 and 3721. For example, you can now set the service type in the ENUM configuration to support `E2U+sip` and `E2U+voicemsg:sip`.

RTN: 1533

Security Features

This section describes additions to the Security feature set.

TLS Key Usage and Other Enhancements

You can configure the role of a certificate by setting key usage extensions and extended key usage extensions as described in RFC 3280. Both of these are configured in the certificate record configuration.

You can also now configure the TLS version.

RTN: 1618

Transcoding Features

This section describes additions to transcoding functionality.

ReINVITE for Fax Calls

In some deployments, an originator sends inband fax messages through the Net-Net SBC to terminating endpoints that do not support uncompressed codecs. Thus the terminating call leg must communicate FAXes either through out of band T.38 or in-band G.711 codecs. In some cases the terminating endpoint can determine that it is being sent a FAX and send a reinvite to request that it be sent T.38 FAX instead of inband FAX. If the Net-Net SBC does not receive this reINVITE, it will send its own reinvite toward the terminating endpoint to establish the FAX session with a codec the endpoint can support.

RTN: 2374

H.323 Transcoding

The Net-Net 9200 supports transcoding between G726 and G711 (PCMU and PCMA) for H.323 to H.323 calls.

RTN: 2591

This feature has not yet completed testing.

Management Enhancements

This section describes the management enhancements that have been added in the Net-Net OS Release S-D7.1.0.

Accounting Enhancements

This section describes the enhancements to Accounting.

Compact Flash Memory Use With Local CDRs

The Net-Net 9200 can use a compact flash memory card that extends the system's internal storage beyond the fixed amount of flash RAM for saving local CDR files.

RTN: 1455

CSV Filename Sequence Numbering

The Net-Net SBC can append a sequence number to the CSV file name to determine if one or more files are missing from a list of file names, which is can be apparent when one views the list of files on a FTP/SFTP server.

RTN: 1757

SIP: Interim RADIUS Records for Recursive Attempts

You can configure SIP accounting to send RADIUS Interim records denoting failures when the Net-Net SBC performs a failed local policy lookup, LRT lookup, ENUM query response, or SIP redirect.

RTN: 1796

Application Management

This section describes application/VoIP protocol management enhancements.

H.323 Stack Monitoring

The H.323 stack/interface configuration now provides a way for you to set alarm thresholds on a per-stack basis. When enabled, this alarm system ties into the **max-calls** value to send critical, major, or minor alarms when the number of calls approaches the threshold.

RTN: 2162

Clear Sessions

The Clear Sessions function gracefully terminates a group of SIP or H.323 sessions from the ACLI. IWF sessions are considered both SIP and H.323 and can be cleared from either SIP or H.323.

RTN: 1777

Displaying and Clearing Registration Cache Entries

The Net-Net SBC's registration cache management offers detailed information (beyond basic registration cache displays) and flexible ways to view the registration cache. You can query, clear, and audit entries.

RTN: 1327

Configuration Management

This section describes configuration management enhancements.

Configuration Inventory Method

The following commands have been enhanced to provide more control when working with configurations:

- backup config
- restore
- show config
- show running-config

RTN: 1690

Verify Config

The **verify config** command checks the consistency of configuration elements that make up the current configuration and should be carried out prior to activating a configuration on the Net-Net SBC.

When the **verify config** command is run, anything configured that is inconsistent produces either an error or a warning message.These messages alert the user as to whether configuration errors have or have no affect on the way Net-Net SBC runs.

RTN: 784

Network Management

This section describes network management enhancements.

Clearing ENUM and DNS Statistics

To clear statistics for ENUM and DNS, you can use additions to the ACLI **reset** command. Before you reset the counters, however, you might want to confirm the current statistics on the system are not zero. You can do so using the show command—by typing, for example, **show enum stats**.

The **reset** command takes the ENUM and DNS arguments to clear those sets of statistics. When you use the command, the system notifies you whether it has successfully cleared the statistics (even if the counter are zero) or if it has run into an error causing the command to fail.

You can **reset all** system statistics using the reset all command.

RTN: 1558

System Management

This section describes system management enhancements.

Tech Support Show Command

The **show support-info** command allows you to gather a set of information commonly requested by the Acme Packet TAC when troubleshooting customer issues.

RTN: 1737

CLI Audit Trail

You can configure your Net-Net SBC to save a history of all user-entered commands to a common audit log file. When you enable this feature, all commands entered from any ACLI session are written to the `/ramdrv/logs/cli.audit.log` file.

RTN: 557

MIB, Trap, and Alarm Changes

This section lists the changes to MIBs, traps, and alarms made as part of the Net-Net OS Release S-D7.1.0. This document's SNMP Changes section provides more information about these additions, and you can find full details in the Net-Net 9000 MIB Reference Guide for this release.

Network Management Control State

You can show the state of a particular network management control by polling the apNetMgmtCtrlStatsTable. A new variable, apNetMgmtCtrlStatsState, has been added to this table to determine if a particular network management control is enabled or disabled.

RTN: 1964

Trap Event Monitoring MIB Table

Two trap tables in the ap-smgmt.mib record trap information for any condition on the Net-Net SBC that triggers an alarm. You can poll these two tables from network management systems, OSS applications, and the Net-Net EMS to view the fault status on one or more Net-Net SBCs.

RTN: 1194

Hardware Enhancements

No new hardware has been released with the Net-Net S-D7.1.0 software release.

S-D7.1.0 ACLI Changes

This section lists changes to the ACLI for the Net-Net 9000 Release S-D7.1.0 from the Net-Net 9000 Release S-D7.1.0. It provides lists of the commands, configuration elements, and configuration parameters that have been added, modified, or deleted.

ACLI Changes: Commands

This section provides tables listing ACLI User and Superuser command that have been added, modified, or deleted.

Availability	Change	Description
S-D7.1.0	backup config • running • editing • saved	Expanding command support backing up a configuration from the running cache or editing cache
S-D7.1.0	clear registration • h323	Expanding command to include the H.323 registration cache
S-D7.1.0	clear sessions • h323 • sip	Adding command to delete SIP and H.323 sessions from the system
S-D7.1.0	reset • dns • enum	Expanding command to reset DNS and ENUM stats
S-D7.1.0	restore • running	Expanding command to include restoration to the last running configuration
S-D7.1.0	set system-state	Adding command to set the Net-Net SBC as either online of offline
S-D7.1.0	show audit-log	Adding command to display an output of the CLI audit log
S-D7.1.0	show built-in-sip-manipulations	Expanding command to show: • Built-in SIP-manipulation rules
S-D7.1.0	show directory	Adding command to display files in directories that are supported by storage expansion in SBC
S-D7.1.0	show enum • status	Expanding command to display ENUM statistics supported by new ENUM configuration parameters
S-D7.1.0	show h323 • stack alarms	Expanding command to support monitoring and alerting max-calls within H.323 stack via SNMP
S-D7.1.0	show mbcd • forked-session	Expanding command to support checking bandwidth constraints once for forked sessions
S-D7.1.0	show redundancy • snmpd	Expanding command to include: • snmp redundancy statistics
S-D7.1.0	show security • ssh-pub-key	Expanding command to include arguments for identifying: • ssh-pub-key
S-D7.1.0	show space	Adding command to show remaining space on device specified
S-D7.1.0	show sip • forked	Expanding command to display the total number of forked sessions received and the total number rejected

Availability	Change	Description
S-D7.1.0	show configuration • sip-isup-profile • inventory	Adding arguments to: • Show the SIP-ISUP-profile configurations • Show the inventory of editing configuration
S-D7.1.0	show running-config • sip-isup-profile • inventory	Adding arguments to: • Show the SIP-ISUP-profile configurations • Show the inventory of the running configuration
S-D7.1.0	show users	Adding command to display the current CLI users
S-D7.1.0	start collection • eps-bw • h323-stats • space	Expanding command to include groups to support gathering data for: • External Policy Server statistics • h323 stack alarm stats • storage space stats
S-D7.1.0	stop collection • eps-bw • h323-stats • space	Expanding command to include groups to support: • External Policy Server statistics • H.323 stack alarm stats • storage space stats
S-D7.1.0	test pattern-rule	Adding command to test a HMR pattern rule
S-D7.1.0	test sip-manipulation	Adding command to test a SIP-manipulation
S-D7.1.0	verify	Adding command to verify configuration parameters of the editing configuration

ACLI Changes: Configuration

This section provides tables that list ACLI configuration paths, configurations, and parameters that have been added, modified, or deleted.

Availability	Change	Description
S-D710	media-manager>ext-policy-server>permit-on-reject	Adding configuration to support enhancements on the Diameter interface, and permit sessions to pass through the SD if the external policy server rejects them
S-D710	media-manager>ext-policy-server>cache-dest-host	Adding configuration to support enhancements on the Diameter interface, and participate in intelligent Diameter session routing for multi-tiered PS architectures
S-D710	media-manager>ext-policy-server>srv-selection-strategy	Adding configuration to select an external policy server from the cluster

S-D710	media-manager>ext-policy-server> • max-connections • max-timouts	Adding configurations to set the maximum number of external policy servers to be monitored, and the maximum number of request timouts before an external policy server is deemed inactive
S-D710	media-manager>media-manager-config>dnsalg-server-failover	Adding configuration to enable DNS queries to be sent to the next configured server
S-D710	media-manager>realm-config>sip-isup-profile	Adding configurations to support, on a per-realm basis, SIP-ISUP format version interworking
S-D710	media-manager>realm-config> match-media-profiles	Adding configurations to apply, on a per-realm basis, media profiles
S-D710	media-manager>realm-config>bw-cac-non-mm	Adding configuration to enable the counting of bandwidth on media when media is released toward the max bandwidth of the corresponding realm
S-D710	media-manager>realm-config> max-priority-bandwidth	Adding configuration to allocate an additional amount of bandwidth for emergency calls
S-D710	security>certificate> • key-usage-list • extended-key-usage-list	Adding configurations to support certificate extensions
S-D710	security>certificate>tls-version	Adding configurations to support certificate extensions for TLS and send specific SSL/TSL “hello” messages
S-D710	session-router>account-config • file-compression • file-decompression	Adding configurations to support storage expansion for CDR files
S-D710	session-router>account-config>push-receiver> • temp-remote-file	Adding parameters to support storage expansion for CDR files
S-D710	session-router>enum-config> • query method • failover-to	Adding configurations to support ENUM queries, either Hunt or Round-robin: • Hunt uses a linear method, and always contacts the first server in the server list; only if that server is unavailable will another server be contacted • Round-robin uses a circular method and contacts each server in the list sequentially; e.g. Server 1 is contacted for the first request, Server 2 for the next, and so on When an enum-config’s servers are unreachable, the Net-Net SBC can failover to a defined ENUM config that contains different enum servers
S-D710	session-router>enum-config> • health-query-number • health-query-interval	Adding configurations to support a health query of ENUM servers by sending a standard ENUM NAPTR query

S-D710	session-router>enum-config>include-source-info	Adding configuration to enable the Net-Net SBC to send source URI information to the ENUM server with any ENUM queries
S-D710	session-router>enum-config> cache-addl-records	Adding configuration for adding additional records received in an ENUM query to the local cache
S-D710	session-router>enum-config> service-type	Adding configuration to support ENUM queries of custom types within a group
S-D710	session-router>h323-config>h323-stack>alarm-threshold	Adding configuration to support monitoring and alerting max-calls within H.323 stack via SNMP
S-D710	session-router>local-policy>policy-attributes> • lookup • next-key	Adding parameters to support multiple stage local policy routing
S-D710	session-age>session-agent>ping-all-addresses	Adding parameter to enable pinging each IP address dynamically resolved via DNS; supports session-agent DNS-SRV load balancing
S-D710	session-router>session-agent>sip-isup-profile	Adding configurations to support, on a per-session agent basis, SIP-ISUP format version interworking
S-D710	session-router>session-router> • additional-lp-lookups • max-routes-per-lookup • total-lp-routes	Adding configuration to support multiple stage local policy routing
S-D710	session-router>sip-config>nsep-sa-sessions-rate	Adding configuration to define a limit for SIP INVITES per second to allow for SIP session agents
S-D710	session-router>sip-config>sag-lookup-on-redirect	Adding configuration to look up SAG name when a Redirect is received
S-D710	session-router>sip-interface>sip-isup-profile	Adding configurations to support, on a per-SIP-interface basis, SIP-ISUP format version interworking
S-D710	session-router>sip-interface>sip-interface>add-sdp-invite	Adding configuration to enable or disable this SIP interface inserting an SDP into either an INVITE or a REINVITE
S-D7.1.0	session-router>sip-interface> • max-nat-interval • nat-int-increment • nat-test-increment • sip-dynamic-hnt	Adding configurations to support adaptive HNT
S-D710	session-router>sip-isup-profile> • name • isup-version • convert-isup-format	Adding sub-element and parameters to configure SIP-ISUP format version interworking

S-D710	session-router>sip-manipulation>mime-isup-rules> • name • content-type • isup-spec • isup-msg-types • action • match-value • comparison-type • msg-type • methods • new-value • mime-header-rules • isup-param-rules	Adding sub-elements and parameters to support SIP-ISUP functionality, which allows for manipulation of ISUP parameters and message parts
S-D710	session-router>sip-manipulation>mime-isup-rules>isup-param-rules • name • type • format • action • comparison-type • match-value • new-value	Adding sub-element to create, manipulate, and store different parameters in the body of an ISUP message
S-D710	session-router>sip-manipulation>mime-isup-rules>mime-header-rules> • name • mime-header-name • action • match-value • comparison-type • new-value	Adding sub-element to configure a SIP header manipulation to add an ISUP body to a SIP message
S-D710	session-router>sip-manipulation>mime-rules> • name • content-type • action • match-value • msg-type • comparison-type • new-value • methods • mime-header-rules • format	Adding configuration to set MIME rules for comparison against specific SIP methods and message types
S-D710	session-router>sip-manipulation>mime-rules>mime-header-rules> • name • mime-header-name • action • match-value • comparison-type • new-value	Adding configuration to set parameters for MIME headers
S-D710	system>system-config>cli-audit-trail	Adding configuration for ACLI command audit trail
S-D710	system>system-config>trap-event-lifetime	Adding configuration to support trap event monitoring

S-D7.1.0 HDR Changes

This section lists additions and modifications to the Net-Net SBC's Historical Data Recording feature set.

ENUM and SIP HDR Statistics

Historical data recording (HDR) support has been expanded to include data for ENUM and for SIP INVITE messages and methods.

Collection Object—ACLI parameter	Metrics Included
SIP Invite Group—sip-invites	• Timestamp • Message/Event • Server Totals • Client Totals
ENUM Group—enum-stats	• Timestamp • ENUM Agent • Transactions • Queries Sent • Queries Send:Success • Queries Sent:NoResults • Queries Sent:Timeout • Queries Sent:Failure • Resolvers • Cached Results • Cached NoResult • Cache Hits (Results) • Cache Hits (NoResult) • Cache Drops

RTN: 1735

H.323 Statistics & Combined Session Agent Statistics Groups for HDR

The following two groups, h323-stats & session-agent, have been added to the Net-Net SBC's HDR functionality.

Collection Object—ACLI parameter	Metrics Included
H.323 Statistics (h323-stats)	• Incoming Calls • Outgoing Calls • Connected Calls • Incoming Channels • Outgoing Channels • Contexts • Queued Messeges • TPKT Channels • UDP Channels
Combined session agent statistics (session-agent)	• 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

RTN: 1773

S-D7.1.0 VSA Changes

There are no RADIUS VSA changes in release S-D7.1.0.

S-D7.1.0 Local CDR Changes

Net-Net OS S-D7.1.0 introduces the SIP: Interim RADIUS Records for Recursive Attempts (18) feature. When enabled, an interim local CDR CSV record is created with a unique format. See the Accounting Guide for more information.

S-D7.1.0 MIB Changes

The Net-Net OS D7.1.0 Release Notes provide the following information about the changes in MIBs between release D7.0 and release D7.1.0.

SNMP Changes

This section summarizes the SNMP/MIB changes that appear in Net-Net OS Release D7.1.0.

Availability	Changes	MIB Details	Description
S-D710		**H.323 stack information**	
	Capability group in MIBS READ ME.txt	apH323StackCap	Acme Packet agent capability
	Capablilty group in ap-agentcapability.mib	apH323StackCap Includes: • apH323StackObjectsGroup • apH323StackNotificationsGroup (apH323MibCapabilities 1)	Acme Packet agent capability
	Object group in ap-h323.mib	apH323StackObjectsGroup Objects: • apH323StackName • apH323StackCurrentCalls (apH323Groups 1)	Object group for providing H.323 stack information
	Object to monitor in ap-h323.mib	apH323StackName (apH323StackEntry 1)	Configured H.323 stack name
	Object to monitor in ap-h323.mib	apH323StackCurrentCalls (apH323StackEntry 2)	Number of current calls
	Notification group in ap-h323.mib	apH323StackNotificationsGroup Notifications: • apH323StackMaxCallThresholdTrap • apH323StackMaxCallThresholdClearTrap (apH323NotificationsGroups 1)	Group listing the traps generated while monitoring H.323 stack
	Traps in ap-h323.mib	apH323StackMaxCallThresholdTrap Objects: • apH323StackName • apH323StackMaxCalls • apH323StackMaxCallsThreshold • apH323StackCurrentCalls (apH323Notifications 1) apH323StackMaxCallThresholdClearTrap (apH323Notifications 2)	Trap generated when the number of H.323 calls increases percentage of the max-calls threshold Trap generated when the number of H.323 calls decreases to below the lowest max-calls theshold
S-D710		**Storage Space**	
	Capability group in MIBS READ ME.txt	apSmgmtStorageSpaceCap	Acme Packet agent capability
	Capability group in ap-agentcapability.mib	apSmgmtStorageSpaceCap, Including: • apSysMgmtStorageSpaceGroup • apSysMgmtStorageSpaceNotificationsGroup (apSmgmtMibCapabilities 43)	Acme Packet agent capability

Availability	Changes	MIB Details	Description
	Object group in ap-smgmt.mib	apSysMgmtStorageSpaceGroup Objects: • apSysVolumeIndex • apSysVolumeName • apSysVolumeTotalSpace • apSysVolumeAvailSpace (apSystemManagementGroups 22)	Objects to monitor storage space
	Object in ap-smgmt.mib	apSysVolumeIndex (apSysStorageSpaceEntry 1)	Monotonically increasing integer for the purpose of indexing volumes
	Object in ap-smgmt.mib	apSysVolumeName (apSysStorageSpaceEntry 2)	Name of the volume
	Object in ap-smgmt.mib	apSysVolumeTotalSpace (apSysStorageSpaceEntry 3)	Total size of the volume in MB
	Object in ap-smgmt.mib	apSysVolumeAvailSpace (apSysStorageSpaceEntry 4)	Total space available on the volume in MB
	Notification group in ap-smgmt.mib	apSmgmtStorageSpaceNotificationsGroup Notifications: • apSysMgmtSpaceAvailThresholdTrap • apSysMgmtpaceAvailThresholdClearTrap (apSystemManagementNotificationsGroups 31)	Monitor available storage space
	Storage space trap in ap-smgmt.mib	apSysMgmtSpaceAvailThresholdTrap • apSysMgmtSpaceAvailCurrent • apSysMgmtSpaceAvailMinorThreshold • apSysMgmtSpaceAvailMajorThreshold • apSysMgmtSpaceAvailCriticalThreshold • apSysMgmtPartitionPath (apSystemManagementMonitors 68)	Generated when the space available on a partition crosses a configured space threshold
	Storage space trap in ap-smgmt.mib	apSysMgmtSpaceAvailThresholdClearTrap (apSystemManagementMonitors 69)	Generated when the space available on a partition falls below the lowest configured threshold
S-D710		**Trap Event Monitoring**	
	Capability group in MIBS READ ME..txt	apSmgmtTrapTableObjectCap	Acme Packet agent capability
	Capability group in ap-agentcapability.mib	apSmgmtTrapTableObjectCap, including: • apSysMgmtTrapTableObjectGroup (apSmgmtMibCapabilities 32)	Acme Packet agent capability
	Object group in ap-smgmt.mib	apSysMgmtTrapTableObjectGroup objects: • apTrapTableSysUptime • apTrapTableNumVariables • apTrapInformationTableDataType • apTrapInformationTableDataLength • apTrapInformationTableDataOctets	Attributes of the trap table in the Session Border Controller
S-D710		**Network Management Control State**	

Availability	Changes	MIB Details	Description
	Capability group in MIBS READ ME..txt	apSmgmtCtrlStatsCap2	Acme Packet agent capability
	Capability group in ap-agentcapability.mib	apSmgmtCtrlStatsCap2 including: • apSysMgmtCtrlStatsGroup2 (apSmgmtMibCapabilities 44)	Acme Packet agent capability
	Object group in ap-smgmt.mib	apSysMgmtCtrlStatsGroup2 • apNetMgmtCtrlStatsState (apSystemManagementGroups 23)	State of a network management control
S-D710		Policy Server Connection and Functional Specification	
	Notification object	apSysMgmtExtPolicyServerConnDownTrap • apSysEPSName • apSysEPSFqdn • apSysEPSAddress • apSysEPSRealm • apSysEPSOperationType (apSystemManagementMonitors 74)	Generated when the SBC is unable to connect to an external policy server
	Notification object	apSysMgmtExtPolicyServerConnEstTrap • apSysEPSName • apSysEPSFqdn • apSysEPSAddress • apSysEPSRealm • apSysEPSOperationType (apSystemManagementMonitors 75)	Generated when the SBC is able to re-establish a connection with an external policy server

Application Alarms

External Policy Server Connection Down Alarms

The following table lists an alarm associated with a failed connection to an external policy server.

Name/ID	Severity/ Health Degredation	Cause(s)	Log Message	Traps Generated
APP_ALARM_EPS_RACF_CONN_FAIL	MINOR/0	Connection to External Policy Server has been lost.	Connection to External Policy Server (RACF) has been lost!!!	apSysMgmtExtPolicyServerConnDownTrap

H.323 Stack Monitor Alarm

The following table lists a configurable alarm for monitoring H.323 stacks and max calls.

Name/ID	Severity/ Health Degredation	Cause(s)	Log Message	Traps Generated
APP_ALARM_H323_STACK_MONITOR/327694	User configurable	The number of calls being sent through an H.323 stack is approaching, or has surpassed a configured percentage of max-calls.	Current calls are over critical threshold of 50 percent. Total no of h323 stack alarm generated are 2	apH323StackMaxCallThresholdTrap

Storage Space Monitor Alarm

The following table lists alarms associated with configurable thresholds for storage space on the PCMCIA Compact Flashcard.

Name/ID	Severity/ Health Degradation	Cause(s)	Log Message	Traps Generated
SPACE_LOW_THRES_ALARM_PCMIA	User configurable	Storage space on the PCMCIA FLASH card is low; thresholds are configurable.		apSysMgmtSpaceAvailThresholdTrap

Documentation Updates

The contents of the S-D7.1.0 documentation set remains the same as in the previous release; it is comprised the following:

Document Number	Document Name	Description
400-0073-20	Net-Net 9200 Hardware Guide 2.0	Describes the hardware components of the Net-Net 9200, and provides removal and replacement procedures
400-0074-70	Net-Net 9000 S-D7.1.0 ACLI Configuration Guide	Provides explanations of features and functions, and provides instructions for configuring your Net-Net 9000 using the Acme Packet command-line interface
400-0076-70	Net-Net 9000 S-D7.1.0 ACLI Reference Guide	Provides detailed alphabetical descriptions of the commands and configurations available on the Net-Net 9000
400-0077-70	Net-Net 9000 S-D7.1.0 MIB Reference Guide	Provides information about the Net-Net 9000's MIB, trap, and alarm support • Includes ZIP file of current MIBs

Document Number	Document Name	Description
400-0078-70	Net-Net 9000 S-D7.1.0 Accounting Reference Guide	Provides information about the Net-Net 9000's RADIUS support, including Acme Packet VSAs
400-0079-70	Net-Net 9000 S-D7.1.0 Maintenance and Troubleshooting Guide	Provides information about viewing and interpreting Net-Net 9000 statistics, as well as other system maintenance information
400-0080-70	Net-Net 9000 S-D7.1.0 Release Notes	Provides an overview of the Net-Net 9000 OS Release S-D7.1.0 ; includes caveats and limitations, and known issues with workarounds

The Net-Net 9200 Hardware Installation Guide document remains unchanged at revision 2.0.

Known Issues

HMR Limitation

S-D7.1.0 HMR Limitation

The following parameters may not be configured with a name longer than 24 characters:

```
sip-manipulation > name
header-rules > name
header-rules > element-rules > name
mime-rules > name
mime-rules > mime-header-rules > name
mime-isup-rules > name
mime-isup-rules > mime-header-rules > name
mime-isup-rules > isup-param-rules > name
```

Existing SIP manipulations whose **name** parameter is greater than 24 characters will continue to function. You may modify any other parameter within any subelement of the existing **sip-manipulation, header-rules, mime-rules,** and **mime-isup-rules** and the configuration will save and retain its functionality. You cannot save these existing configuration elements if you modify the name or *-rules parameters and it remains longer than 24 characters.

This limitation also applies for realm-config > realm-id parameter and wherever it is referenced.