Release Notes for Cisco Network Analysis Module Software, Release 5.0

January 25, 2011, OL-21577-01

These release notes provide general information about Cisco Network Analysis Module (NAM) software release 5.0 including new features and enhancements, system requirements, software upgrade, limitations and restrictions, caveats, and product documentation.

The Cisco Network Analysis Module (NAM) Traffic Analyzer software enables network managers to understand, manage, and improve how applications and services are delivered to end users. The NAM combines flow-based and packet-based analysis into one solution. The NAM can be used for traffic analysis of applications, hosts, and conversations, performance-based measurements on application, server, and network latency, quality of experience metrics for network-based services such as Voice over IP (VoIP) and video, and problem analysis using deep, insightful packet captures. The Cisco NAM includes an embedded, web-based Traffic Analyzer GUI that provides quick access to the configuration menus and presents easy-to-read performance monitoring and analysis on web, voice, and video traffic.

NAM 5.0 introduces a redesigned interface and user experience, with more intuitive workflows and interactive reporting capabilities. The dashboard-style layouts show multiple charts in one window, thereby giving you the ability to view a lot of information at once. All of the new features are described in the section New Features and Enhancements in NAM 5.0, page 3.

Table 1 lists the software product numbers for NAM 5.0.

Table 1 Software Product Numbers

Part Number	Description
NAM-APPL-SW-5.0	Cisco NAM 5.0 for Appliances w/Recovery CD
SC-SVC-NAM-5.0	Cisco NAM 5.0 for Cat6500/C7600 NAM
NME-NAM-SW-5.0	Cisco NAM 5.0 for Branch Routers NAM
WAAS-VB-NAM-5.0	Cisco NAM Software 5.0 for WAAS 574/674
WAAS-VB-NAM-5.0=	Cisco NAM Software 5.0 for WAAS 574/674 Spare
L-WAAS-VB-NAM-5.0	Cisco NAM Software 5.0 for WAAS 574/674 (eDelivery)

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Table 1 Software Product Numbers

Part Number	Description
WAAS-VB-NAM-50UP=	Cisco NAM Software 5.0 for WAAS 574/674 SAS Upgrade Only
L-WAAS-VB-NAM-50UP	Cisco NAM Software 5.0 for WAAS 574/674 SAS Upgrade Only

The NAM 5.0 software does not support any upgrade paths from NAM 3.x or NAM 4.x releases.

NAM Platforms

The following models differ in memory, performance, disk size, and other capabilities. Therefore, some allow for more features and capabilities (for example, the amount of memory allocated for capture).

NAM 5.0 software supports the following NAM models (SKU):

- Cisco NAM 2204 Appliances
  - NAM2204-RJ45
  - NAM2204-SFP
- Cisco NAM 2220 Appliance
  - NAM2220
- Cisco 6500 Series Switches and Cisco 7600 Series Routers
  - WS-SVC-NAM-1
  - WS-SVC-NAM-1-250S
  - WS-SVC-NAM-2
  - WS-SVC-NAM-2-250S
- Cisco Branch Routers
  - NME-NAM-80S
  - NME-NAM-120S
- Cisco WAAS NAM Virtual Service Blade

Note The Cisco Nexus 1010 Virtual Services Appliance is not supported with NAM Traffic Analyzer Release 5.0. The suggested upgrade path for Nexus 1010 NAM 4.2 users is from NAM 4.2 to 4.2(1N), and then to NAM 5.1 (when available).

Contents

This document includes the following sections:

New Features and Enhancements in NAM 5.0

Dashboards

The Cisco NAM Traffic Analyzer, Release 5.0 introduces a redesigned interface and user experience, with more intuitive workflows and interactive reporting capabilities. The dashboard-style layouts show multiple charts in one window, thereby giving you the ability to view a lot of information at once.

There are two types of dashboards in NAM 5.0: One type is the “summary” view found under the Monitor menu, and the other type is the “over time” view found under the Analyze menu. The Monitor dashboards allow you to view network traffic, application performance, site performance, and alarms at a glance. From there, you can isolate one area, for example an application with response time issues, and then drill-down to the Analyze dashboard for further investigation.

Figure 1 shows an example of one of the Monitoring dashboards in the NAM 5.0 release.

Figure 1 Dashboard in NAM 5.0

The Analyze dashboards allow you to zoom or pan to reselect the range. As you change the range, the related graphs at the bottom will update.

The dashboards can be extracted as a PNG. You can also create a Scheduled Export to have the dashboards extracted regularly and sent to you in CSV or HTML format.

Logical Site

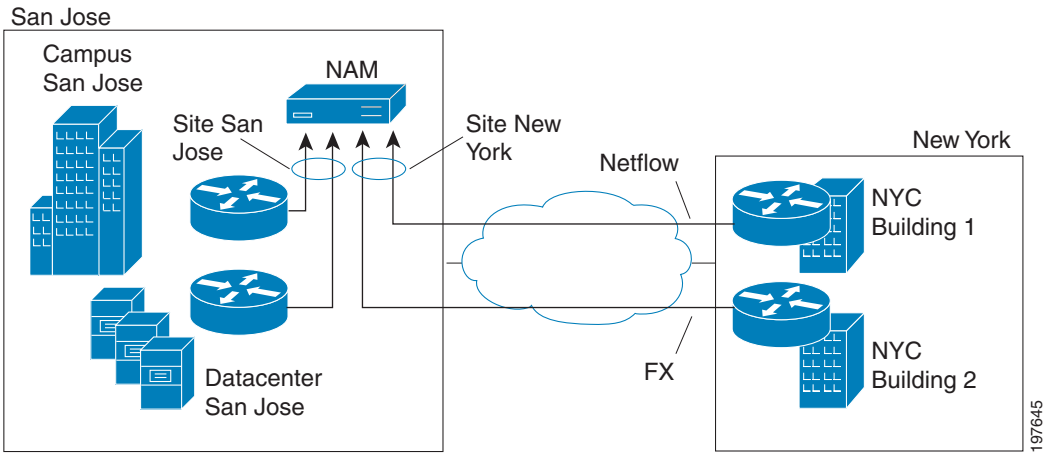
Cisco NAM Traffic Analyzer 5.0 introduces the capability for you to define a site, with which you can aggregate and organize performance statistics. A site is a collection of hosts (network endpoints) partitioned into views that help you monitor traffic and troubleshoot problems. A site can be defined as a set of subnets specified by an address prefix and mask, or using other criteria such as a remote device data source (for example, remote WAE device and segment information). If you want to limit the view of your network analysis data to a specific city, a specific building, or even a specific floor of a building, you can use the sites function.

You can also include multiple types of data sources in the site definition, and you can then get an aggregated view of all network traffic.

The pre-defined “Unassigned Site” makes it easy to bring up a NAM without having to configure user-defined sites. Hosts that do not belong to any user-defined site will automatically belong to the Unassigned Site.

Figure 2 shows an example of how a network may be configured using sites.

Figure 2 Site Level Aggregation



New Application Classification Architecture

In previous releases of NAM, the RMON-2 protocol directory infrastructure was used to identify applications and network protocols. In NAM Traffic Analyzer Release 5.0, the application classification scheme is changed to align with the methodology used by Cisco with technologies such as NBAR (Network-Based Application Recognition) and SCL. It also accepts standardized application identifiers exported by Cisco platforms with NDE (NetFlow Data Export).

This allows you to gain application visibility with consistent and unique application identifiers across the network. For example, you can view applications using a global unique identifier, as compared with multiple classification engines using different applications identifiers.

Standards-Based NBI

NBI (Northbound Interface), also referred to as API (Application Programming Interface) enables partners and customers to provision the NAM and extract performance data. Previous releases of NAM were limited to SNMP s, and direct-URL knowledge for access to some data, including the method by which CSV-formatted data is retrieved.

With NAM 5.0, the NBI is expanded to include a Representational State Transfer (REST) web service for configuration, and retrieval of data pertaining to sites. Also introduced is the capability to export high-volume performance data in the form of Netflow v9 (see the next section, "NetFlow v9 Data Export").

Note REST does not support retrieval of performance data for sites.

REST is a set of guidelines for doing web services over HTTP. It takes advantage of the HTTP method (GET, POST, UPDATE, DELETE) as part of the request.

The REST request/response messages using the REST web service will contain XML data in the body content of the HTTP request. An XML schema will describe the message content format. All REST request/response messages are handled in XML format. Then the REST web service consumer can use any HTTP client to communitate with the REST server. To use the REST web service via HTTPS, the NAM crypto patch needs to be installed on the NAM.

The NBI web service will provide an external API interface for provisioning and retrieving performance data. For application developers who want to use the NAM APIs to provision network services and leverage data, see the *Cisco Network Analysis Module 5.0 API Programmer's Guide*. The developers who use the APIs should have an understanding of a high-level programming language such as Java or an equivalent.

NetFlow v9 Data Export

The NAM uses NetFlow as a format for the ongoing streaming of aggregated data, based on the configured set of descriptors or queries of the data attributes in NAM. The NAM as a producer of NDE (NetFlow Data Export) packets is a new feature for NAM Traffic Analyzer 5.0. The NAM's new functionality of NDE is part of its new NBI.

NetFlow collects traffic statistics by monitoring packets that flow through the device and storing the statistics in the NetFlow table. NDE converts the NetFlow table statistics into records, and exports the records to an external device, which is called a NetFlow collector.

The NDE Descriptor is a permanent definition of the NAM aggregated data query of aggregated NAM data, which must be exported to designated destinations across the network using the industry-wide standard of NetFlow v9 running on top of the standard UDP transport.

The NDE Descriptor defines the data query that remains in effect as long as the NDE descriptor exists in NAM's permanent storage. Having it instantiated means that the NAM will be exporting the matching aggregated data records continuously (in a specified frequency) until the NDE descriptor is deleted or updated.

Historical Analysis

Unlike previous versions of the NAM, in which you have to configure targeted historical reports in advance, the NAM Traffic Analyzer 5.0 stores short-term and long-term data that you can view using the new dashboards.

The NAM proactively collects and stores up to 72 hours of data at a granularity of 1, 5, or 10-minute intervals, and longer-term data with a granularity of 1 to 2 hours. This allows you to specify different time periods to view trends over time, and identify potential problems.

SNMP v3 Support -- NAM to Router/Switch Support

Simple Network Management Protocol Version 3 (SNMPv3) is an interoperable standards-based protocol for network management. The security features provided in SNMPv3 are:

- Message integrity—Ensuring that a packet has not been tampered with in-transit.
- Authentication—Determining the message is from a valid source.
- Encryption—Scrambling the contents of a packet prevent it from being seen by an unauthorized source.

With NAM 5.0, you have the ability to manage devices with SNMPv3.

Note For the WS-SVC-NAM-1 and WS-SVC-NAM-2 platforms, SNMPv3 is not required. SNMP requests and responses are communicated over an internal interface within the chassis, and SNMPv3 is not used.

System Requirements

This section describes the platform hardware, platform software, NAM hardware, and NAM software requirements for NAM 5.0 software:

Platform Hardware Requirements

Table 2 identifies the hardware modules and platforms required to use NAM 5.0.

At least 1 GB of memory is required to run the NAM Traffic Analyzer 5.0 software on any of the supported platforms.

Table 2 NAM Hardware Compatibility

Module	Cisco IOS	Platform or Devices
WS-SVC-NAM-1 WS-SVC-NAM-1-250S WS-SVC-NAM-2 WS-SVC-NAM-2-250S	SUP720 SUP32 RSP720-1G SUP720-10G RSP720-10G	• Catalyst 6500 Series Switches • Cisco 7600 Series Routers
NME-NAM-120S NME-NAM-80S	n/a	• Cisco 2800 Series Integrated Services Routers (except Cisco 2801) • Cisco 2900 Series Integrated Services Routers (except Cisco 2901) • Cisco 3700 Series Multiservice Access Routers • Cisco 3800 Series Integrated Services Routers • Cisco 3900 Series Integrated Services Routers

Using NME-NAMs with Cisco Integrated Services Routers

This section describes the requirements to use NME-NAMs with Cisco Integrated Services Router (ISR) and ISR Generation Two (G2) Platforms.

You can deploy the NME-NAM-120S and NME-NAM-80S in any network module slot in the Cisco router platforms indicated in Table 3. A Network Module (NM) Adapter Card, SM-NM-ADPTR, is required to successfully integrate the NME-NAM into supported ISR G2 platforms. The NME-NAM

supports the router platforms using NAM 3.6 or later. See Table 5, Minimum Cisco ISR and ISR G2 IOS Versions Required for NAM 5.0, for the minimum IOS software requirements to support NME-NAM. Only one Cisco NAM can be installed in a Cisco branch router.

Table 3 Supported Routers

Router Platform	Network Module Adapter Card Required?
Cisco 3945 ISR	Yes
Cisco 3925 ISR	Yes
Cisco 2951 ISR	Yes
Cisco 2921 ISR	Yes
Cisco 2911 ISR	Yes
Cisco 3845 ISR	No
Cisco 3825 ISR	No
Cisco 2851 ISR	No
Cisco 2821 ISR	No
Cisco 2811 ISR	No
Cisco 3745 MSR	No
Cisco 3725 MSR	No

To install an NME-NAM-120S network module in supported ISR G2 platforms using the NM Adapter Card, see *Installing Cisco Network Modules and Service Modules*, section "Using Network Modules in Service Module Slots on Cisco 2900 Series and Cisco 3900 Series Routers":

http://www.cisco.com/en/US/docs/routers/access/interfaces/nm/hardware/installation/guide/InstNetM.html

Platform Software Requirements

Table 4 lists the Minimum Cisco Catalyst 6500 and Cisco 7600 Series IOS Versions Required for NAM 5.0.

Table 4 Minimum Cisco Catalyst 6500 and Cisco 7600 Series IOS Versions Required for NAM 5.0

Chassis	Supervisor Card	SXF	SXH	SXI	SRA	SRB	SRC	Other
Catalyst 6500 Switches	SUP32	12.2(18) SXF	12.2(33) SXH(1)	12.2(33) SXI				
	SUP 32 PISA							12.2(18) ZY(1)
	SUP720	12.2(18) SXF	12.2(33) SXH(1)	12.2(33) SXI				
	SUP720-10GE		12.2(33) SXH(1)	12.2(33) SXI				

Table 4 Minimum Cisco Catalyst 6500 and Cisco 7600 Series IOS Versions Required for NAM 5.0

Chassis	Supervisor Card	SXF	SXH	SXI	SRA	SRB	SRC	Other
7600 Series Routers	SUP32	12.2(18) SXF			12.2(33) SRA(1)	12.2(33) SRB(1)	12.2(33) SRC	
	SUP720	12.2(18) SXF			12.2(33) SRA(1)	12.2(33) SRB(1)	12.2(33) SRC	
	RSP720-1G						12.2(33) SRC	
	RSP720-10GE							12.2(33) SRD

Table 5 lists the Minimum Cisco ISR and ISR G2 IOS Versions Required for NAM 5.0 on both the NME-NAM-120S and the NME-NAM-80S.

Table 5 Minimum Cisco ISR and ISR G2 IOS Versions Required for NAM 5.0

Router Platform	IOS Version
Cisco 2800 Series Integrated Services Routers	12.4(9)T
Cisco 2900 Series Integrated Services Routers	15.0(1)M
Cisco 3700 Series Multiservice Access Routers	12.4(9)T
Cisco 3800 Series Integrated Services Routers	
Cisco 3900 Series Integrated Services Routers	15.0(1)M

NAM and IOS Software Requirements for Virtual Switch System

Table 6 lists the NAM and IOS software requirements for NAM blades used in a Cisco Virtual Switch System (VSS) environment.

Table 6 NAM and IOS Software Requirements for VSS

NAM	NAM Software	IOS Software
WS-SVC-NAM-1	NAM 3.6.1a or later	IOS 12.2(33) SXH(1) or later
WS-SVC-NAM-2		
WS-SVC-NAM-1-250S	NAM 3.6.1b or later	
WS-SVC-NAM-2-250S		

WAAS Appliance Requirements

NAM 5.0 supports the WAVE-574 and WAE-674 WAAS appliances. Table 7 provides a description of the Cisco WAAS appliances, their components, and deployment scenarios. WAAS appliances require the following software:

- Central Manager: WAAS 4.2.3 (build 55 or later).
- Managed WAAS: WAAS 4.2.3 (or later).

Table 7 Cisco WAAS Appliances

Platform	Component	Deployment Scenarios
Cisco WAVE-574	• 3 or 6 GB DRAM • 500 GB hard disk drive • RAID-1 (optional) • 2- and 4-port inline card options • WAAS-VB-NAM-5.0	• Edge deployments at enterprise branch offices • Core deployments at small data centers
Cisco WAE-674	• 4 or 8 GB DRAM • 600 GB HDD • RAID-5 (optional) • 4-port inline card optional • WAAS-VB-NAM-5.0	• Edge deployments at large enterprise branch offices • Core deployments at medium-sized data centers

Catalyst 6500 NAM-1 and NAM-2 Memory Recommendation

To optimize the performance of NAM software, particularly of NAM 5.0 releases given new features that can have large table sizes, Cisco offers a field-installable memory upgrade kit that can be purchased for WS-SVC-NAM-1 and WS-SVC-NAM-2 devices. The memory upgrade kit comes with 2GB of DRAM. Its part number is MEM-C6KNAM-2GB=.

Cisco has characterized that the memory upgrade can increase the number of hosts and conversations that can be monitored by up to a factor of two (the improvement can vary depending on packet sizes monitored, burstiness of traffic, NAM features enabled, switch/router features enabled, and so on). The memory upgrade not only can improve the number of hosts and conversations monitored, but also, as a result of the foregoing, can increase the number of concurrent flows that can be monitored. This can result in improved NAM performance when the NAM is deployed in places in the network where it can see a large number of concurrent flows.

You can find information about how to upgrade your memory in the document *NAM Memory Upgrade Install Note* at the following URL:

http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/hardware/Config_Notes/78_18630.html

No memory upgrade kit is offered for the WS-SVC-NAM-1-250S and WS-SVC-NAM-2-250S, which already ship from factory with 2 GB DRAM.

Browser Requirements

Table 8 describes the browser requirements for all platforms.

Table 8 Minimum Browser Requirements

Browser	Versions	Client Platform	JVM Support[1]
Internet Explorer	8.0 (7.0 not supported)	• Windows • Windows XP Professional	Java Plug-In 1.5.0_11
English Firefox	3.6	• Windows • Windows XP Professional • Solaris • Linux (RHEL)	

1. A Java plug-in might be required to use the Java Virtual Machine (JVM).

Note Although Traffic Analyzer does not require a Java plug-in, you might be required to use the Java Virtual Machine (JVM). The Java plug-in versions listed have been tested for browsers that require a plug-in for the JVM. Cisco recommends JRE Version 5.0 Update 6.

Catalyst 6500 and Cisco 7600 NAM-1 and NAM-2 Maintenance Image and BIOS Requirements

Table 9 lists the minimum versions of the NAM maintenance image, the maintenance image filename, and the BIOS image required for NAM-1 and NAM-2 when using NAM application image 5.0.

Table 9 NAM Maintenance Images

Module	Version (minimum)	Maintenance Image	BIOS Version
WS-SVC-NAM-1	2.1(3)	c6svc-nam-maint.2-1-3.bin.gz	4.0-Rel 6.0.9 or later
WS-SVC-NAM-2			

The BIOS image is bundled with the NAM's maintenance image.

The Upgrading to NAM 5.0 section of these Release Notes provides information on:

- How to identify the version of the Catalyst 6500 and Cisco 7600 NAM's BIOS image
- How to upgrade the Catalyst 6500 and Cisco 7600 NAM's Maintenance image
- How to upgrade the Catalyst 6500 and Cisco 7600 NAM's BIOS image
- How to upgrade the NAM's Application Image

NAM Virtual Blade Licensing Requirements

NAM virtual blade software (for the WAAS) requires you to install a product license in the form of a text file. An evaluation license allows you to use the software for up to 60 days, but you will be unable to log in to the NAM GUI after the evaluation license expires. When using an evaluation license, the NAM login window indicates how many days remain before the evaluation license expires.

You can provide licensing information, also known as node-locking information, during software installation or after software installation using the NAM CLI. During the NAM software installation, you will be prompted to enter a product identifier (PID) and serial number (SN).

To obtain a NAM Virtual Blade license, go to the following URL:

http://www.cisco.com/go/license

Follow the instructions on this page to obtain a NAM VB license file. You will need the appliance PID and SN to obtain the license file. After you enter the PID and SN or the Product Authorization Key, a license file will be sent to you by Email. Store this license file on an available FTP server. Use the **license install** command to install the license after the NAM software installation completes.

Upgrading to NAM 5.0

This section provides the following topics:

Supported Upgrades

NAM 5.0 does not support any upgrades from the NAM 3.x or NAM 4.x software releases on NAM devices. You will need to do a fresh install of NAM 5.0. NAM 5.0 has a new architecture that will cause you to lose the configuration you have currently set in your NAM. Cisco highly recommends that you back up your current configuration in case you want to go back to a previous version of NAM, where you can restore the saved configuration.

To back up your current configuration, from the NAM command line enter a config upload command like the following:

```
config upload ftp://server/path
```

The config upload command sends a copy of the NAM running configuration to the destination you specify. The information is stored in a back-up configuration file with an ending suffix of .confg as in NAM_host-c6svc-nam-3.6.1b.confg. The destination address should be a valid server name and directory path.

Installing NAM Software

You can only do a fresh install of NAM 5.0. See the Installation and Configuration Guide specific to your platform.

For Cisco 2200 Series Appliances, see the following URL:

http://www.cisco.com/en/US/products/ps10113/prod_installation_guides_list.html

For the WAAS NAM Virtual Blade, see the following URL:

http://www.cisco.com/en/US/products/ps10506/prod_installation_guides_list.html

For all other platforms, see the following URL:

http://www.cisco.com/en/US/products/sw/cscowork/ps5401/tsd_products_support_series_home.html

Note If you were an EFT user, and will be installing the general availability NAM 5.0 release, you will need to clear your browser cache after installing the new NAM image.

Upgrading Catalyst 6500 and Cisco 7600 NAM-1 and NAM-2 Maintenance Image Software

To upgrade the NAM maintenance image software, follow these steps.

Note This section applies only to the WS-SVC-NAM-1 and WS-SVC-NAM-2 blades running a maintenance image before version 2.1(3).

Step 1 Copy the NAM maintenance software image to a directory accessible to FTP.

You can download the latest version of the NAM maintenance image from the following URL:

http://www.cisco.com/cgi-bin/tablebuild.pl/ws-svc-nam

The most recent NAM maintenance image software available to download is 2.1(5), and its filename is **c6svc-nam-maint.2-1-5.bin.gz**.

Step 2 Log in to the switch through the console port or through a Telnet session.

Step 3 If the NAM is running in the application image, go to Step 5. If the NAM is not running in the application image, enter this command in the privileged mode:

```
Router# hw-module module 9 reset hdd:1
Device BOOT variable for reset = hdd:1
Warning:Device list is not verified.

Proceed with reload of module? [confirm]
% reset issued for module 9
Router#
00:31:11:%SNMP-5-MODULETRAP:Module 9 [Down] Trap
00:31:11:SP:The PC in slot 9 is shutting down. Please wait ...
00:31:25:SP:PC shutdown completed for module 9
00:31:25:%C6KPWR-SP-4-DISABLED:power to module in slot 9 set off (admin
request)
00:31:28:SP:Resetting module 9 ...
00:31:28:%C6KPWR-SP-4-ENABLED:power to module in slot 9 set on
00:33:26:%SNMP-5-MODULETRAP:Module 9 [Up] Trap
```

```
00:33:26:%DIAG-SP-6-BYPASS:Module 9:Online Diagnostics is Bypassed
00:33:26:%OIR-SP-6-INSCARD:Card inserted in slot 9, interfaces are now
online
```

Step 4 After the NAM is back online, establish a console session with the NAM and log in to the root account.

Step 5 Upgrade the NAM maintenance image software as follows:

```
root@localhost# upgrade ftp-url
```

where *ftp-url* is the FTP location and name of the NAM software image file.

Note If the FTP server does not allow anonymous users, use the following syntax for the *ftp-url* value: *ftp://user@host//absolute-path/filename*. Enter your password when prompted.

Step 6 Follow the screen prompts during the upgrade.

Step 7 After completing the upgrade, log out of the NAM.

Step 8 Boot into the maintenance image to reset the NAM maintenance image software with a command like the following:

```
Router# hw-module module 9 reset cf:1
Device BOOT variable for reset = cf:1
Warning:Device list is not verified.

Proceed with reload of module? [confirm]
% reset issued for module 9

Router#
00:16:06:%SNMP-5-MODULETRAP:Module 9 [Down] Trap
00:16:06:SP:The PC in slot 9 is shutting down. Please wait ...
00:16:21:SP:PC shutdown completed for module 9
00:16:21:%C6KPWR-SP-4-DISABLED:power to module in slot 9 set off (admin request)
00:16:24:SP:Resetting module 9 ...
00:16:24:%C6KPWR-SP-4-ENABLED:power to module in slot 9 set on
00:18:21:%SNMP-5-MODULETRAP:Module 9 [Up] Trap
00:18:21:%DIAG-SP-6-BYPASS:Module 9:Online Diagnostics is Bypassed
00:18:21:%OIR-SP-6-INSCARD:Card inserted in slot 9, interfaces are now online
Router#
```

Step 9 (Optional) Verify the initial configuration after the NAM comes back online by logging into the NAM root account as follows:

```
root@localhost# show ip
```

Step 10 (Optional) Reboot into the application image as follows:

```
Router# hw-module module 9 reset
```

This example shows how to upgrade the NAM maintenance image software:

```
Router#
Router# hw-module module 9 reset hdd:1
Device BOOT variable for reset = hdd:1
Warning:Device list is not verified.

Proceed with reload of module? [confirm]
% reset issued for module 9
Router#
00:31:11:%SNMP-5-MODULETRAP:Module 9 [Down] Trap
```

```
00:31:11:SP:The PC in slot 9 is shutting down. Please wait ...
00:31:25:SP:PC shutdown completed for module 9
00:31:25:%C6KPWR-SP-4-DISABLED:power to module in slot 9 set off (admin
request)
00:31:28:SP:Resetting module 9 ...
00:31:28:%C6KPWR-SP-4-ENABLED:power to module in slot 9 set on
00:33:26:%SNMP-5-MODULETRAP:Module 9 [Up] Trap
00:33:26:%DIAG-SP-6-BYPASS:Module 9:Online Diagnostics is Bypassed
00:33:26:%OIR-SP-6-INSCARD:Card inserted in slot 9, interfaces are now
online
Router#

Router# session slot 9 proc 1
The default escape character is Ctrl-^, then x.
You can also type 'exit' at the remote prompt to end the session
Trying 127.0.0.91 ... Open

Cisco Network Analysis Module (WS-SVC-NAM-2)

login:root
Password:

Cisco Network Analysis Module (WS-SVC-NAM-2) Console, 5.0
Copyright (c) 2010 by cisco Systems, Inc.

WARNING! Default password has not been changed!
root@localhost.cisco.com#

root@localhost.cisco.com# upgrade ftp://host/pub/c6svc-nam-maint.2-1-5.bin.gz

Downloading image...
ftp://host/pub/c6svc-nam-maint.2-1-5.bin.gz (11065K)
-                         [##########################]   11065K |  837.65K/s
11331153 bytes transferred in 13.21 sec (837.64k/sec)

Uncompressing the image...

Verifying the image...

Applying the Maintenance image.
This may take several minutes...

Upgrade of Maintenance image completed successfully.
root@hostname.cisco.com# exit

Router# hw-module module 9 reset cf:1
Device BOOT variable for reset = cf:1
Warning:Device list is not verified.

Proceed with reload of module? [confirm]
% reset issued for module 9
Router#
02:27:19:%SNMP-5-MODULETRAP:Module 9 [Down] Trap
02:27:19:SP:The PC in slot 9 is shutting down. Please wait ...
02:27:36:SP:PC shutdown completed for module 9
02:27:36:%C6KPWR-SP-4-DISABLED:power to module in slot 9 set off (admin
request)
02:27:39:SP:Resetting module 9 ...
02:27:39:%C6KPWR-SP-4-ENABLED:power to module in slot 9 set on
02:29:37:%SNMP-5-MODULETRAP:Module 9 [Up] Trap
02:29:37:%DIAG-SP-6-BYPASS:Module 9:Online Diagnostics is Bypassed
02:29:37:%OIR-SP-6-INSCARD:Card inserted in slot 9, interfaces are now
online
Router#
```

Upgrading Catalyst 6500 and Cisco 7600 NAM-1 and NAM-2 BIOS Image Software

Note This section applies only to the WS-SVC-NAM-1 and WS-SVC-NAM-2 blades running a BIOS image prior to version 6.0.9.

Note The BIOS image is bundled with the NAM's maintenance image.

The NAM maintenance image software also provides upgrade software for your BIOS. If the **show version** command indicates a BIOS version below 4.0-Rel 6.0.9, see the following procedure for performing a BIOS upgrade:

Step 1 Boot the NAM to the maintenance image. Enter the following command from the Supervisor CLI:

hw-module module <module-number> reset cf:1

Step 2 After the NAM has booted the new maintenance image, session into the NAM module with the following Supervisor CLI command:

session slot <module-number> processor 1

Step 3 Log in as user *root* with the default password *cisco*.

Step 4 Enable the *guest* account (disabled by default) for the maintenance image. Enter the following command at the NAM maintenance CLI:

enable-guest

Note You can only perform the BIOS upgrade procedure from the *guest* account.

Step 5 Log out of the NAM CLI.

Step 6 Log in again as the user *guest*.

The default password for the *guest* account is *cisco*.

Warning **While the new BIOS is being programmed, the procedure should not be interrupted in any way. Do not turn power off or shut down the NAM until the programming is complete.**

A message such as `BIOS programming complete` displays when the procedure is finished, usually in less than two minutes.

Step 7 While logged into the *guest* account, enter the following command to begin the BIOS upgrade procedure:

upgrade-bios

Step 8 When prompted for the filename of the BIOS file to be programmed. Enter the following filename:

`B01MQ009.ROM`

Note In the above filename, use the *digit 0*, not the *letter O,* except for the **.ROM** extension which does use the *letter O*.

The following output shows an example of this procedure:

```
------------------------------------------------------------
guest@nam-test.cisco.com#upgrade-bios
Enter filename of BIOS file to be programmed: B01MQ009.ROM
Write BIOS File B01MQ009.ROM to Flash

WARNING: Removing or powering down this module during BIOS programming may resul t in the
module unable to come online!

Erasing old BIOS...
Programming new BIOS...DONE
Verifying new BIOS...DONE

BIOS programming complete
guest@nam-test.cisco.com#
------------------------------------------------------------
```

Step 9 Log out of the NAM CLI (returning to the Supervisor CLI), and enter a command like the following to boot the NAM Application image:

hw-module module <module-number> reset hdd:1

Step 10 Enter the **show version** command to verify the BIOS was successfully installed.

show version

The output of the **show version** command should look something like the following:

```
BIOS Version: 4.0-Rel 6.0.9
```

This **show version** command output indicates that the most recent BIOS version (4.0-Rel 6.0.9) is installed.

You can now reboot the NAM Application image and resume normal NAM operation.

Limitations and Restrictions

The following limitations and restrictions currently apply to the NAM 5.0 software release:

- NAM Creates Capture File on Cancel
- NAM Support With Non-Cisco H.323 Voice Devices and Call Managers
- ACS Version Supported
- Direct Flow Packets to NAM Data Port
- No Default CLI Password
- Response Time and Voice Quality Analytics
- Intelligent Application Performance
- Checking the NAM Maintenance Image and BIOS Versions

NAM Creates Capture File on Cancel

If you are using a Cisco 2200 Series appliance, and during **Capture > Packet Capture/Decode > Files** you click on the **Download** button, a **xxx.pcap** file is created regardless of whether you accept the download action or cancel it. This is why one capture done from a Cisco 2200 Series appliance may have an extra file, while another from a different platform may not.

NAM Support With Non-Cisco H.323 Voice Devices and Call Managers

NAM voice call monitoring may not function properly with some of the non-Cisco voice devices and Call Managers such as Avaya. This is only for non-Cisco voice devices. Cisco IP Phone and Call Managers do not have any problems.

ACS Version Supported

The only ACS server versions supported are ACS versions 5.1 and 4.2.

Direct Flow Packets to NAM Data Port

If you use a NAM-2 device, either WS-SVC-NAM-2 or WS-SVC-NAM-2-250S, we recommend that you direct all packets for the same flow to the same data port.

Note This issue applies only to the WS-SVC-NAM-2 and WS-SVC-NAM-2-250S NAM models.

NAM-2 devices have two data ports (DATA_PORT1 and DATA_PORT2), but the packets received on these two ports are not well merged in respect to the order in which the packets are received. When packets for a given flow are split into two data ports, it might impact the calculation of application response time (ART) metrics and voice quality metrics.

No Default CLI Password

For security purposes, beginning with NAM 4.1, we no longer provide a default root password. After you install NAM 5.0, you must specify a password for the root account. Store this password in accordance with your site's security policies. You will need the root account password for additional software upgrades.

Response Time and Voice Quality Analytics

The calculation of Application Performance Response Time and voice quality metrics in NAM 5.0 depends on the actual packet arrival time and packet sequences. In events such as packet drops, duplicated packets, or asymmetric routing, the NAM might not be able to calculate accurate quality metrics for the associated polling interval.

You should pay attention to the NAM **syslog** messages and system alerts to remain aware of any packet drops or duplicated packets occurrences.

Intelligent Application Performance

Due to the way NAM 5.0 processes packets in a TCP connection, response time monitoring on WAAS data sources probably will not include the first response of the TCP connection. This occurs because the WAAS optimization engine might not be able to determine to which optimized or non-optimized segment the first few packets belong.

This issue will be noticed when you monitor a TCP connection that has only a single response. No response time will be reported for this connection. The NAM determines response time by taking the average response time over multiple TCP connections. Because most TCP connections have multiple responses, this issue is generally unnoticed over a longer period of monitoring.

Checking the NAM Maintenance Image and BIOS Versions

NAM 5.0 software requires that you use the correct NAM maintenance image and BIOS versions. The recommended BIOS version for NAM 5.0 software is BIOS 6.0.9.

The recommended MP version depends on the NAM model. See Table 9 for the recommended maintenance image for each NAM platform. If you need to upgrade your NAM maintenance image, see Upgrading Catalyst 6500 and Cisco 7600 NAM-1 and NAM-2 Maintenance Image Software.

NAM Appliance Support for Cisco Nexus 7000

With the deployment flexibility the new Cisco NAM 2200 Series appliances offer, you now have a NAM solution to gain visibility into network and application performance for the Cisco Nexus 7000 Series switches. The Cisco NAM 2200 Series appliances provide core NAM functionality to support the Cisco Nexus 7000 Series including monitoring, reporting, capturing data and alarms. The NAM appliances support features such as traffic analysis, Intelligent Application Performance (IAP) monitoring, differentiated services analysis, and voice quality monitoring. The same NAM software image supports all tested infrastructure devices.

The Cisco NAM 2200 Series appliances do not yet offer the same level of management interface support they offer other tested devices, such as the Catalyst 6500 Series switches. This affects the following NAM functions:

- Configuring a SPAN session on the Nexus 7000 Series using the NAM GUI. Instead, use the switch CLI to configure such a session.
- Monitoring and reporting traffic statistics about the managed device. Managed device statistics include port (mini-RMON), VLAN, and device health statistics. This limitation does not affect monitoring and reporting statistics on traffic that you can SPAN to NAM.
- Configuring and displaying alarms about the managed device.

Support for both NBAR-PD and MPLS functionality is not available for the Nexus 7000.

Restrictions for NME-NAMs

Note This restriction applies only to traffic that is monitored through the internal NAM interface on the NME-NAM-80S and NME-NAM-120S.

The NAM Traffic Analyzer (web GUI) provides Layer 3 and higher layer information about the original packets. The Layer 2 header is modified by the router when it forwards the packets to the NAM, so the Layer 2 information that the NAM records is not applicable to the original packets.

Most Recent NAM 5.0 Information

To see the most recent version of the NAM 5.0 User Guide, see the technical documentation for the Network Analysis Module on www.cisco.com:

http://www.cisco.com/en/US/products/sw/cscowork/ps5401/tsd_products_support_series_home.html

IOS Issues That Might Affect NAM 5.0

The following IOS issues might affect your use of NAM 5.0 depending on other software versions.

- IOS Image Incompatibility Prevents Creating SPAN Data Sources Using NAM GUI
- Cisco 7600 With Redundant Supervisor Cards Running IOS Image 12.2(33)SRC2
- Running IOS Image Newer Than 12.2(18)SXF5
- RSPAN and ERSPAN Unsupported in IOS Image 12.2(33)SRD

IOS Image Incompatibility Prevents Creating SPAN Data Sources Using NAM GUI

An issue with the supervisor card and IOS images 12.2(18)SXF9 and 12.2(33)SRB1 prevents you from creating SPAN data sources (SPAN sessions) using the NAM GUI. (This issue is described in CSCse98807.)

Note This issue has been resolved with IOS image 12.2(18)SXF10.

You can also use switch command-line interface (CLI) commands to create SPAN sessions, or you can use other IOS releases on the supervisor card, such as 12.2(18)SXF10 or 12.2(33)SRB2, that fix this IOS issue.

On affected systems, when you attempt to use the NAM GUI to create a SPAN session by choosing **Setup > Data Source** and clicking **Create**, the NAM GUI displays no information for the Destination Port. This prevents you from creating the SPAN session.

Cisco 7600 With Redundant Supervisor Cards Running IOS Image 12.2(33)SRC2

You might experience an error condition with a Cisco 7600 chassis that has redundant supervisor cards running the 12.2(33)SRC2 IOS image and a NAM service blade. The error occurs when you perform a sequential boot of the two supervisor cards because the secondary (standby) supervisor does not go into proper standby mode.

You can find more information about this issue in Field Notice #63179.

Note This issue has been resolved in 12.2(33)SRC3.

This problem does not occur:

- When you boot the two supervisor cards in parallel
- When you boot the standby supervisor card after the primary supervisor is up
- When the Cisco 7600 router runs the 12.2SRC1 image
- When only one supervisor card is installed in the Cisco 7600 chassis

Problem Symptom

When the primary supervisor functions as a standalone with the secondary supervisor card in RPR mode, the Cisco 7600 chassis functions normally (as if it has a standalone supervisor card). A switchover causes the system to be unavailable for up to three minutes because the secondary supervisor card is not in proper standby mode.

Note When both supervisors are booted simultaneously, the system will go to Hot Standby status. The primary supervisor will reboot when you issue the **redun force-switchover** command which causes the redundant supervisor to boot up to be the primary and the primary to be the redundant.

Solution

This problem requires you to downgrade the IOS image from 12.2SRC2 to 12.2SRC1. Account teams will help you do this if needed.

Running IOS Image Newer Than 12.2(18)SXF5

If you upgrade your IOS to an image newer than 12.2(18)SXF5, you remain vulnerable to a security issue where IOS switches the SNMP communication between the NAM and the SUP from inband to EOBC.

Due to this issue, you should not apply the NAM CLI command **supervisor address <*sup-address*>**. To remove this configuration from the NAM, use the negating form of the command, **no supervisor address**.

Note This issue has not yet been resolved.

RSPAN and ERSPAN Unsupported in IOS Image 12.2(33)SRD

The ERSPAN command is not working properly in NAM 5.0 when using IOS image 12.2(33)SRD. The problem is noticed when you attempt to configure a destination on the NAM in ERSPAN or RSPAN sub-mode.

After issuing the command:

destination analysis-module 3 data-port 1

Where module 3 is the NAM you have set up to monitor (using the command **monitor session 1 type erspan-destination**), the configured destination cannot be found.

This problem also affects the local SPAN (with sub-mode configuration).

Note This issue has been resolved with IOS image 12.2(33)SRD1 or later.

Caveats

This section provides information about active anomalies in the NAM 5.0 software. To obtain more information about known problems, access the Cisco Software Bug Toolkit at the following URL:

http://www.cisco.com/cgi-bin/Support/Bugtool/home.pl

Known Anomalies in NAM 5.0

Table 10 provides a list of known anomalies found in NAM 5.0 software. Each anomaly includes a description of the symptom, conditions in which the anomaly occurs, and any workaround.

Table 10 Known Anomalies in NAM 5.0

Bug ID	Description
CSCtk05827	In the Analyze charts (charts that display data over time), when you switch from Chart view to Grid view, the minute 24 is always displayed as 0. There is no workaround.
CSCtj02587	If you use two Cisco SIP phones to call each other, the NAM will display each phone call as two call legs: Phone A to Cisco Call Manager, and Phone B to Cisco Call Manager. The symptom is the same for MGCP protocol. This does not occur with callls using H.323 and SCCP protocols. This occurs because with SIP or MGCP protocol, the NAM uses Call ID to correlate the signaling information to call data. The Cisco SIP and MGCP implementation has Call ID per call leg. As a result, the NAM treats each call leg as a call. There is no workaround.
CSCtj66006	In the Calls Table, when you click on a row, the row is not highlighted (and appears that the entry is not selected), but the RTP Streams table at the bottom of the page shows the data for the clicked row. Workaround: If you will need to refer back to the row you clicked, keep your mouse on it to keep it highlighted.

Table 10 Known Anomalies in NAM 5.0 (continued)

Bug ID	Description
CSCti04208	In **Administration > Users > Local Database**, if you define your login to have only SystemConfig permissions, you will be able to see: **Administration > System > Syslog Setting** **Administration > System > SNMP Trap Setting** in the menus. But after clicking on either of those items, an error message will be shown: "You are not authorized to access this page" Workaround: Create a user with both SystemConfig and AlarmConfig permissions. That user will be able to see and run the above two items.
CSCtj95276	When a capture-to-file session has been started and stopped before the files are full, the most recent file that was written to will be in the Stopped state, and will not be able to be deleted (the **Delete** button will be disabled). Workaround: Go to **Capture > Packet Capture/Decode > Sessions**, choose the session, and click Clear to clear that session. Return to the **Capture > Files** page, and the State will no longer be Stopped and the file can be deleted.
CSCtj87352	The Top Application Traffic chart may show data from a site that has been disabled. This happens when the disabled site has some residue traffic flows that keep going on long after the site has been disabled. **Note** Site classification is done at the beginning of each flow. Changes to the site definitions will take effect for new flows only, not existing flows. Workaround: Stop and restart the data source to reset the traffic flows from the disabled site.
CSCtj87477	If you give the NAM an incorrect password, and then hit the Tab button to get to the Login again, and then hit Enter, you will get two "Invalid Username or Password" error messages. If you just hit Enter right after giving the wrong password, you will get only one error message. There is no workaround.
CSCtk01498	On the **Administration > System > Network Parameters** page, there are three fields in which to enter a Nameserver. If you enter three and then click **Submit**, the screen will refresh but all name servers are gone. This happens on all NAM platforms. Workaround: Enter only one or two name servers before clicking **Submit**.
CSCtk13839	The **Clear** button in **Analyze > Managed Device > NBAR** page can become nonfunctional. Workaround: Refresh the screen.
CSCtj76473	The Interface Selector on the **Analyze > Traffic > NDE Interface** dashboard does not save the most recent interface selection when you refresh the dashboard or you return to this dashboard within the same session (the Interface Selector list remains expanded to the most recent selection). Workaround: Select the interface again to view interface charts.

Table 10 Known Anomalies in NAM 5.0 (continued)

Bug ID	Description
CSCtj95419	The following activities are not recorded in Audit Trail: • Create or Delete Managed Device • Create or Delete Data Source • Add or Delete NDE Interface Capacity • Update of **Setup > Classification > Encapsulations** • Update of **Setup > Monitor > Aggregation Intervals** • Update of **Setup > Monitoring > WAAS Servers** There is no workaround
CSCti84981	Some required fields in Setup and Administration pages do not display the flag that indicates that it is required. There is no workaround.
CSCti63415	If there is temporary connectivity failure or network congestion, the delivery of exported NetFlow packets (NDE sent as UDPs) can fail. As a result, the number of messages successfully exported from NAM to the external collector can be less than count of aggregated records in internal NAM storage. This has been observed under conditions of NAM or network overload. There is no workaround.

Cisco NAM 5.0 Software Documentation

This section provides a list of the NAM 5.0 software documentation. You can find links to all NAM software documentation at the following URL:

http://www.cisco.com/en/US/products/sw/cscowork/ps5401/tsd_products_support_series_home.html

The following is a list of the documentation for Cisco Network Analysis Module (NAM) Traffic Analyzer 5.0 (in the order in which you should address it).

- *Release Notes for the Cisco Network Analysis Module, Release 5.0*
- *User Guide for the Cisco Network Analysis Module Traffic Analyzer, Release 5.0*
- *Cisco NAM Command Reference, Release 5.0*
- *Cisco NAM 5.0 API Programmer Guide*
- *Third Party and Open Source Copyright Notices for the Cisco Network Analysis Module, Release 5.0*

You can access the URLs listed for each document on the World Wide Web.

Release Notes for the Cisco Network Analysis Module, Release 5.0

OL-21577-01

The *Release Notes for the Cisco Network Analysis Module, 5.0* provide a collection of information including software and hardware compatibility and information about new features, requirements, and anomalies that might exist.

http://cisco.com/en/US/docs/net_mgmt/network_analysis_module_software/5.0/release/notes/nam50note.html

User Guide for the Cisco Network Analysis Module Traffic Analyzer, Release 5.0

OL-21525-01

The *User Guide for the Cisco Network Analysis Module Traffic Analyzer, 5.0* describes how to use the Network Analysis Module Traffic Analyzer and NAM 5.0 user software.

http://cisco.com/en/US/docs/net_mgmt/network_analysis_module_software/5.0/user/guide/nam50_ug.html

Cisco NAM Command Reference, Release 5.0

OL-23534-01

The *Cisco NAM Command Reference, Release 5.0* provides information about how to use the NAM command-line interface to manage the NAM devices supported by NAM 5.0 software, including:

- NAM2220
- NAM2204-RJ45
- NAM2204-SFP
- WS-SVC-NAM-1
- WS-SVC-NAM-1-250S
- WS-SVC-NAM-2
- WS-SVC-NAM-2-250S
- NME-NAM-80S
- NME-NAM-120S

The *Cisco NAM Command Reference, Release 5.0* also supports the following WAAS appliances:

- WAVE-574
- WAE-674

http://www.cisco.com/en/US/docs/net_mgmt/network_analysis_module_software/5.0/command/reference/guide/cmdref.html

Cisco NAM 5.0 API Programmer Guide

OL-22489-01

The *Cisco Network Analysis Module (NAM) API Programmer Guide* describes APIs that are available to connect to the NAM system. The NAM API provides a mechanism for provisioning and retrieving data from the NAM servers using an eXtensible Markup Language (XML) interface. The API utilizes REpresentational State Transfer (REST) methodology to execute requests (web services) over HTTP or HTTPS by sending the XML data to the API server.

http://www.cisco.com/en/US/docs/net_mgmt/network_analysis_module_software/5.0/developer/guide/API_Guide.html

Third Party and Open Source Copyright Notices for the Cisco Network Analysis Module, Release 5.0

OL-21732-01

The *Copyright Notices for the Cisco Network Analysis Module, 5.0* provides a listing of all copyright notices for the open source third-party software used in NAM 5.0.

http://cisco.com/en/US/docs/net_mgmt/network_analysis_module_software/5.0/copyright/notice/3rd_copy.html

Cisco 2200 Series NAM Appliance Documentation

This section describes the Cisco 2200 Series NAM Appliance documentation.

- *Quick Start and Documentation Guide for the Cisco 2200 Series NAM Appliance*
- *Installation and Configuration Guide for the Cisco NAM 2204 Appliance*
- *Installation and Configuration Guide for the Cisco NAM 2220 Appliance*
- *Regulatory Compliance and Safety Information for the Cisco NAM 2200 Series Appliances*

Quick Start and Documentation Guide for the Cisco 2200 Series NAM Appliance

78-18440-01

The *Quick Start and Documentation Guide for the Cisco 2200 Series NAM Appliance* is available online at the following URL:

http://cisco.com/en/US/docs/net_mgmt/network_analysis_module_appliance/2220/roadmap/docguide.html

This document contains a description of the documentation for the NAM appliance and NAM software and information about how to get started with the NAM appliance.

Installation and Configuration Guide for the Cisco NAM 2204 Appliance

OL-22621-01

The *Installation and Configuration Guide for the Cisco NAM 2204 Appliance* provides information to help you install and configure the NAM 2204 appliance. This guide includes overview information and details about how to install the appliance, connect the appliance to power and the device it monitors, configure the appliance, log in, and get started setting up the appliance to monitor the device.

The *Installation and Configuration Guide for the Cisco NAM 2204 Appliance* is an online only document you can find at the following URL:

http://www.cisco.com/en/US/docs/net_mgmt/network_analysis_module_appliance/5.0/2204/installation/guide/instcfg2204.html

Installation and Configuration Guide for the Cisco NAM 2220 Appliance

OL-22622-01

The *Installation and Configuration Guide for the Cisco NAM 2220 Appliance* provides information to help you install and configure the NAM 2220 appliance. This guide includes overview information and details about how to install the appliance, connect the appliance to power and the device it monitors, configure the appliance, log in, and get started setting up the appliance to monitor the device.

The *Installation and Configuration Guide for the Cisco NAM 2220 Appliance* is an online only document you can find at the following URL:

http://www.cisco.com/en/US/docs/net_mgmt/network_analysis_module_appliance/5.0/2220/installation/guide/instcfg2220.html

Regulatory Compliance and Safety Information for the Cisco NAM 2200 Series Appliances

78-18308-01

The *Regulatory Compliance and Safety Information for the Cisco NAM 2200 Series Appliances* is a printed document that ships with the NAM appliance and is also available online at the following URL:

http://cisco.com/en/US/docs/net_mgmt/network_analysis_module_appliance/regulatory/compliance/nam2200rcsi.html

The *Regulatory Compliance and Safety Information for the Cisco 2200 Series NAM Appliances* contains regulatory compliance and safety information for the Cisco 2200 Series NAM appliances.

Cisco NAM Virtual Services Blade Documentation

The following URL provides links to product support, additional product literature, software, and other helpful information for the Cisco WAAS NAM Virtual Blade:

http://www.cisco.com/en/US/products/ps10506/index.html

Installation and Configuration Guide for the Cisco WAAS NAM Virtual Services Blade, 5.0

OL-22490-01

The *Installation and Configuration Guide for the Cisco WAAS NAM Virtual Services Blade, 5.0* provides detailed steps to install the NAM VSB on a WAAS appliance and configure the NAM VSB.

http://www.cisco.com/en/US/docs/net_mgmt/network_analysis_module_virtual_blade/5.0/install/guide/waas/waas50install.html

Related Documentation

This section provides information about other documentation related to the Network Analysis Module and NAM 5.0 software.

NAM-1 and NAM-2

Catalyst 6500 Series Switch and Cisco 7600 Series Router Network Analysis Module Installation Note, 5.0

http://www.cisco.com/en/US/docs/net_mgmt/network_analysis_module_software/5.0/switch/configuration/guide/swinstcfg.html

NME-NAM

Cisco Branch Routers Series Network Analysis Module (NME-NAM-120S) Installation and Configuration Note, 5.0

http://www.cisco.com/en/US/docs/net_mgmt/network_analysis_module_software/5.0/branch_router/configuration/guide/BRincfg_50.html

Cisco NAM Enhanced Network Modules

http://www.cisco.com/en/US/docs/routers/access/interfaces/nm/hardware/installation/guide/namnme.html

Installing Cisco Network Modules and Service Modules

http://www.cisco.com/en/US/docs/routers/access/interfaces/nm/hardware/installation/guide/InstNetM.html

Cisco 3800 Series Hardware Installation

http://cisco.com/en/US/docs/routers/access/3800/hardware/installation/guide/hw.html

Cisco 3700 Series Routers Hardware Installation Guide

http://www.cisco.com/en/US/docs/routers/access/3700/hardware/installation/guide/3700hig.html

Installing Network Modules in Cisco 2800 Series Routers

http://www.cisco.com/en/US/docs/routers/access/2800/hardware/installation/guide/08_hw.html

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly What's New in Cisco Product Documentation, which also lists all new and revised Cisco technical documentation, at the following URL:

http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html

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