Cisco Network Analysis Module 2200 Series Appliances 4.2

Overview

Q. What are the Cisco® Network Analysis Module (NAM) 2200 Series Appliances?

A. The Cisco NAM 2200 Series Appliances are advanced Cisco instrumentation that provide performance management, traffic analysis, and troubleshooting services to help IT managers ensure the consistent and efficient delivery of applications to end users. An extension of the Cisco Network Analysis Module (NAM) blades, the Cisco NAM 2200 Series Appliances offer next-generation performance, superior scalability, and maximum deployment flexibility, delivering comprehensive performance monitoring throughout the borderless network.

The design of the Cisco NAM 2200 Series Appliances is founded on the Cisco Common Appliance Model, Cisco's computing-optimized platform, and includes purpose-built hardware to maximize packet processing in high-speed networking environments. The results are robust appliances that provide granular traffic analysis, rich application performance measurements, exceptional voice quality of experience monitoring, and deep insightful packet captures.

The Cisco NAM 2200 Series Appliances include the Traffic Analyzer GUI, which provides quick access to the configuration menus and presents easy-to-read performance reports on web, voice, and video traffic.

Q. How many models of Cisco NAM 2200 Series Appliances are available? Can you describe them?

A. Cisco offers two Cisco NAM 2200 Series Appliances: the Cisco NAM 2220 Appliance and the Cisco NAM 2204 Appliance. The Cisco NAM 2220 Appliance includes two 10 Gigabit Ethernet monitoring interfaces and six 146 GB Serial Attached SCSI (SAS) hard disk drives with RAID for multiservices monitoring in high-speed, high-density environments. The Cisco NAM 2220 comes with an option for redundant power. To extend uptime, both the hard disk drives and the power supplies are hot-swappable. The Cisco NAM 2204 includes four 1 Gigabit Ethernet monitoring interfaces and two 250 GB Serial Advanced Technology Attachment (SATA) hard disk drives to meet diverse performance analysis needs in scalable multigigabit switching and routing environments. The Cisco NAM 2204 is available in two models depending on the interface connection type, the NAM2204-RJ45 (copper connection) and the NAM2204-SFP (optical connection).

Q. What are the key features and benefits of the Cisco NAM 2200 Series Appliances?

A. The key features and benefits of the Cisco NAM 2200 Series Appliances are provided in Table 1.

Table 1. Key Features and Benefits of the Cisco NAM 2200 Series Appliances

Feature	Benefit
Application Performance Monitoring	Delivers application performance monitoring and real-time visibility for voice, video, and data applications. Cisco NAM helps improve the operational efficiency of IT organizations by proactively detecting performance degradations and their sources to minimize or even eliminate impact on end users.
Transaction-Aware Application Response Time Monitoring	Analyzes TCP-based application packets as they travel from the client through the network to the data center and out again, providing insight into network round-trip time, server response time, data transfer time, transaction time, and so on, to improve application performance.
Cisco Wide Area Application Services (WAAS) Support	Measures application response time, WAN bandwidth usage, LAN/WAN data throughput, and so on to effectively use WAAS for improving application performance.
Visibility into Nexus 1000V Deployments	Simplifies the operational manageability of Cisco Nexus 1000V switch environments.
Voice-over-IP (VoIP) and Video Packet Quality Analysis	Analyzes voice and video packet streams and provides visibility into key network performance indicators to maximize the quality of the end-user experience.
Comprehensive Flow-Based Monitoring	Automatically identifies hundreds of protocols and provides real-time and historical performance reports on hosts, conversations, and applications using critical network resources.

Feature	Benefit
LAN and WAN Monitoring in One Solution	Provides visibility into traffic from local and remote switches and routers for comprehensive traffic monitoring.
Web-Based Captures for Deep, Insightful Data Analysis	Captures the packets to help resolve acute problems before they affect users. Captures can be performed using a web browser from any desktop, and decodes can be viewed through the Traffic Analyzer GUI. Extensive capture features, including trigger-based captures, decodes, filters, and a capture analysis toolset, help to quickly pinpoint and resolve problem areas.
Anytime, Anywhere Access	Includes an embedded Traffic Analyzer web interface that can be accessed from any desktop, eliminating the need to send personnel to remote sites or haul large amounts of data over WAN links to the central site.
Pre- and Post Deployment Metrics to Quantify Business Changes	Provides valuable "before and after" traffic analytics to help plan for and verify changes in network resources, such as new application rollouts, WAN optimization, server consolidation, segmenting the network, and deploying VoIP and video.
Secure Solution	Offers TACACS+, Secure Sockets Layer (SSL), and Secure Shell (SSH) Protocol–based security.
Deployment Flexibility	Cisco NAM can be deployed in blade form factor in Cisco Catalyst® 6500 Series Switches, Cisco 7600 Series Routers, and Cisco Integrated Services Routers, as multi gigabit appliances, and as virtual service blades residing directly on WAAS devices or on the Nexus 1010 Virtual Service Appliance. The complement of physical and virtual blades and of appliances allows NAM instrumentation to be broadly deployed in the network for comprehensive performance monitoring.

Q. What are the business benefits of deploying Cisco NAM 2200 Series Appliances?

A. Table 2 provides an overview of the business benefits that the NAMs offer.

Table 2. Business Benefits of Deploying Cisco NAMs

Benefit	Description
Improve Application Performance	Gain comprehensive visibility into network services and applications that make up the business. Improve network performance by effectively using control and optimization mechanisms such as Quality of Service (QoS) and WAAS.
Manage Application Delivery	Use the combination of application performance monitoring, traffic analysis, and advanced troubleshooting to manage the effective and reliable delivery of applications from the branch to the data center.
Increase Operational Efficiency	Accelerate problem isolation and minimize the amount of time IT dedicates to constantly troubleshooting problems.
Enhance Service Levels Delivered to End Users	Preempt performance issues with threshold-based proactive alerts. Reduce downtime and failures.
Improve Network Security	Prevent unauthorized or frivolous use of network resources.

Q. What are the primary differences between the Cisco NAM 2220 Appliance and the Cisco NAM 2204 Appliance?

A. The NAM 2220 and the NAM 2204 share a similar hardware foundation and the same software application, but differ in the following important ways:

- The NAM 2220 includes a more powerful processor and a faster packet processing engine that provides more than four times the monitoring performance of the NAM 2204.
- The NAM 2220 includes higher density storage commensurate with its higher monitoring performance. Two of the NAM 2220's six SAS drives support RAID 1 to minimize downtime. The other four support RAID 0 to improve the speed at which capture data are written to the drives.
- The NAM 2220 includes an option for a redundant power supply. When a redundant power supply is available, the unit will continue to operate should a power supply fail. The failed power supply can then be replaced without having to power down the unit.
- The NAM 2220 supports up to two 10 Gigabit Ethernet optical connections. The NAM 2204 supports up to four each of either 10/100/1000 RJ-45 connections or 1 Gigabit Ethernet optical connections.
- The form factor of the NAM 2220 is 2 Rack Units (RUs); the NAM 2204 is 1 RU.
- As a result of the NAM 2220's higher monitoring performance, it offers higher scalability, supporting the monitoring of a larger number of conversations, Real Time Protocol (RTP) streams, WAAS connections, NetFlow records, and so on.

Q. Is the Cisco NAM 2204 upgradeable to the Cisco NAM 2220?

A. No. The NAM 2204 and the NAM 2220 have fixed configurations and cannot be transformed from one version to the other.

Q. What is the Cisco NAM Traffic Analyzer?

A. The Cisco NAM includes embedded software, called the Cisco NAM Traffic Analyzer, which analyzes and stores the data and presents the data to clients using a supported web browser.

Q. Where can the Cisco NAM 2200 Series Appliances be deployed in the network?

A. The Cisco NAM 2200 Series Appliances are dedicated performance monitoring instrumentation and connect to the Switched Port Analyzer (SPAN) ports of a switch using copper or fiber optical interface modules. They can also connect to critical network links using third-party passive inline taps. They can be deployed in multiple places in the network and complement Cisco NAM blades to provide extensive network visibility. The Cisco NAM Appliances can be deployed at LAN aggregation points, for example, in the campus core and distribution layers, for always-on performance management; at services points, for example, in data centers or Cisco Unified Communications Manager clusters in IP telephony networks, where assuring application delivery is critical; and in important access points, close to servers, key clients, in IP phone closets, where traffic monitoring is essential. They can also be deployed at WAN edges.

Latest Release: NAM 4.2

Q. What features does NAM Software 4.2 offer?

A. Cisco NAM 4.2 offers the features described in Table 3.

Table 3. New Features in Cisco NAM 4.2

Feature	Benefit
Visibility into Nexus 1000V Deployments	Extends the NAM into Cisco Nexus 1000V switch environments to simplify the operational manageability of virtual machine (VM) networks.
New Cisco Nexus 1000V NAM Virtual Service Blade (VSB)	Integrated with the Cisco Nexus 1010 Virtual Service Appliance, the NAM VSB reduces the network footprint and offers investment protection for Cisco Nexus 1010 customers. As a dedicated solution, it provides network and application performance visibility essential to addressing service delivery challenges in next-generation data centers.

Q. When is NAM 4.2 available?

A. Starting in April 2010, current Cisco NAM customers can download Cisco NAM 4.2 software from the Cisco.com Software Center at no charge using their Cisco SMARTnet® contract access privileges. NAM 4.2 is available in May as part of NAM Appliances orders.

Q. Which NAM hardware platforms support NAM 4.2?

A. NAM 4.2 is supported on the hardware platforms listed in Table 4. The platforms marked by an asterisk (*) include memory configurations that optimize NAM 4.2 performance.

Table 4. NAM Hardware Platforms Supported with NAM 4.2

Description	Hardware Part Number
Cisco NAM 2200 Series Appliances	NAM2204-RJ45*
	NAM2204-SFP*
	NAM2220*
Cisco Catalyst 6500 Series and Cisco 7600 Series NAM-1	WS-SVC-NAM-1-250S*
	WS-SVC-NAM-1 with MEM-C6KNAM-2GB=*
	WS-SVC-NAM-1
Cisco Catalyst 6500 Series and Cisco 7600 Series NAM-2	WS-SVC-NAM-2-250S*
	WS-SVC-NAM-2 with MEM-C6KNAM-2GB=*
	WS-SVC-NAM-2
Cisco Branch Routers Series NAM	NME-NAM-120S*
	NME-NAM-80S

Q. How do the NAM 4.2 features benefit Cisco NAM 2200 Series Appliances users?

A. With NAM 4.2, the Cisco NAM Appliances extend into the virtual networking layer, simplifying manageability of Cisco Nexus 1000V switch environments by offering visibility into the VM network including interactions across virtual machines and virtual interfaces. The Cisco NAM Appliances provide combined network and application performance analytics that are essential in addressing service delivery challenges in the virtualized data center. The Cisco NAM Appliances can help users to:

- Monitor the network and VMs uninterrupted by vMotion operations
- Analyze network usage by applications, hosts/VMs, conversations, and VLANs to identify bottlenecks that may impact performance and availability
- Troubleshoot performance issues with extended visibility into VM-to-VM traffic, virtual interface statistics, and transaction response times
- Assess the impact on the network of changes such as VM migrations, dynamic resource allocations, and port profile updates
- Improve the efficiency of the virtual infrastructure and distributed application components with comprehensive traffic analysis

Q. What devices do the Cisco NAM 2200 Appliances monitor in the virtualized data center?

A. The Cisco NAM 2200 Appliances can monitor traffic within the Cisco Nexus 1000V switch environment in addition to monitoring Cisco Nexus 7000 traffic. The Cisco Nexus 1000V switch is a software switch on a server that delivers Cisco Virtual Network Link (VN-Link) services to VMs hosted on the server and includes two major components: the Virtual Ethernet Module (VEM) and the Virtual Supervisor Module (VSM), which manages the VEMs.

Q. What NAM data sources can be used to monitor traffic in the Cisco Nexus 1000V switch environment?

A. The Cisco NAM 2200 Appliances monitor the Cisco Nexus 1000V using the Encapsulated Remote SPAN (ERSPAN) and NetFlow data sources (for more information about NAM data sources, please refer to Table 5 of this Q&A). The ERSPAN data source delivers network traffic to NAM from specific ports or VLANs on the Cisco Nexus 1000V. The NAM uses this data to provide core traffic usage statistics (on applications, hosts, and conversations), IAP analytics, and QoS and VLAN monitoring statistics. The NetFlow data source delivers network traffic to the NAM on select virtual and physical interfaces of the Cisco Nexus 1000V. The NAM consumes this data to generate core traffic usage and QoS monitoring reports. By offering a choice of data sources, the NAM allows network administrators to meet diverse and ever-changing traffic management needs in the virtualized data center.

Q. Can the Cisco NAM Appliances monitor VMware vMotion?

A. VMware vMotion is a technology that allows server administrators to perform live migrations of virtual machines with zero downtime. Typically, this operation is used both to facilitate optimization of the virtual computing infrastructure and to perform hardware maintenance without scheduling downtime or disrupting business operations, thereby improving IT service levels. Deploying the Cisco Nexus 1000V along with a Cisco NAM 2200 Appliance, the VMs can be monitored uninterrupted by vMotion operations. Thus, application traffic destined for or originating from a specific VM can be continuously monitored to help ensure that application response times are preserved during VM migrations. And, in cases where response times have increased, the NAM allows network administrators to analyze the impact and instigate a fast, data-driven corrective response.

Q. When would I purchase a Cisco NAM Appliance versus a Cisco Nexus 1000V NAM VSB?

A. The Cisco NAM Appliance is a self-contained hardware device that provides visibility into both physical and virtual networks. It comes with a feature set and level of performance purpose-built to perform high-throughput monitoring and troubleshooting in the campus or data center. The Cisco Nexus 1000V NAM VSB is a software module integrated in the Cisco Nexus 1010 Virtual Service Appliance. The Cisco Nexus 1000V NAM VSB comes with a feature set and level of performance specifically targeted to perform monitoring and troubleshooting in the Cisco Nexus 1000V environment. The Cisco NAM VSB is a perfect fit for customers who are deploying the Cisco Nexus 1010, offering both ease of deployment and investment value. Those customers who may want to monitor more than the Cisco Nexus 1000V environment, who require higher overall performance, or who perform extensive captures and decodes will want to consider a Cisco NAM 2200 Appliance.

Technical Overview

Q. How does the Cisco NAM work?

A. The Cisco NAM collects packets or flows (NetFlow Data Export [NDE]) being sent to it from the switch, router, WAE device, or tap. The NAM parses the packets and extracts data to populate standards-based MIBs and proprietary extensions included in the NAM. These MIBs and extensions provide valuable traffic information on voice, video, and data traffic, VLANs, Differentiated Services (DiffServ) configurations, hosts, conversation pairs, application usage, and application response times. This information is presented in the NAM's Traffic Analyzer GUI in easy-to-read real-time and historical reports. It can also be accessed using a standards-based centralized Simple Network Management Protocol (SNMP) console or exported to third-party tools using Comma-Separated Value (CSV) format and other mechanisms to build additional value for enterprisewide performance assurance and reporting.

The packets that the Cisco NAM collects are defined by the user's selecting one or more data sources. Data sources, which are features of the switch, router, or WAAS device, are described in Table 5 and include SPAN, Remote SPAN (RSPAN), Encapsulated RSPAN (ERSPAN), VLAN access control list (VACL) capture, NDE, and WAAS Flow Agent. The tap data source is described in detail in a question and answer that appears later in this document.

Table 5. Cisco NAM 2200 Series Appliances Data Sources

Data Source	Description
SPAN, RSPAN, and ERSPAN	Using the SPAN, RSPAN, and ERSPAN capabilities of Cisco switches and routers, traffic from ports, VLANs, and EtherChannel links can be mirrored to the NAM. The NAM collects statistics on all layers of network traffic spanned to it. RSPAN allows traffic to be collected from other RSPAN-enabled devices in the same VLAN Trunk Protocol (VTP) domain. ERSPAN allows traffic to be sent to the NAM using encapsulated GRE tunnels from a Layer 3 network.
VACLs	The NAM uses VACLs to capture or "filter" selected VLANs and WAN traffic (on Cisco IOS devices only) to the NAM ports. Additional filtering rules can also be applied to target specific data flows. The NAM must be specified as the capture destination for VACL entries when configuring the local supervisor.
NDE	NetFlow Data Export records offer an aggregate view of the network traffic. When enabled on the switch, the NetFlow data source becomes available on the Cisco NAM without the need to create any SPAN sessions. In addition, the NAM can receive NDE from remote devices for analysis.
WAAS Flow Agent	The NAM gathers WAAS Flow Agent data for optimized and pass-through traffic to provide end-to-end application performance visibility in a Cisco WAAS environment. The Flow Agent data enables NAM to measure application response time, transaction time, bandwidth usage, and LAN/WAN data throughput to accurately quantify the impact of Cisco WAAS optimizations.

Q. How do the Cisco NAM Appliances gain visibility into traffic from more than one switch or router?

A. There are multiple ways to gain visibility into traffic from more than one device with the Cisco NAM Appliances:

- The NAM Appliances include more than one monitoring interface, which enable them to collect traffic from more than one device
- The NAM Appliances can be used with a passive inline tap to monitor traffic from/between multiple devices
- The LAN or WAN traffic from other devices can be directed to the NAM Appliances for analysis using RSPAN, ERSPAN, or NDE

Q. How many monitoring ports do the Cisco NAM Appliances support?

A. The NAM Appliances support the following number of monitoring ports:

- Up to two 10 Gigabit Ethernet monitoring ports on the NAM 2220
- Up to four 1 Gigabit Ethernet monitoring ports on the NAM 2204

Q. What data sources are received on the monitoring ports? On the management port?

A. The following data sources are received on the:

- **Monitoring Ports:** SPAN, RSPAN, VACL capture, tap
- **Management Port:** ERSPAN, NDE, WAAS Flow Agent

Q. Is there a limit on the number of SPAN sessions that the NAM Appliances can support?

A. The NAM 2204 Appliance has four physical monitoring interfaces and can monitor up to four switches using SPAN at one time. The NAM 2220 has two physical monitoring interfaces and can monitor up to two switches using SPAN at one time. Since the switch currently offers support for up to two SPAN sessions, the NAM 2204 can monitor one SPAN session each on four switches or two SPAN sessions each on two switches. The NAM 2220 can monitor one SPAN session each on two switches or two SPAN sessions each on one switch. The NAMs also have an ALLSPAN capability, which enables traffic collected from all physical interfaces on the appliances to be viewed as an aggregate.

Q. What are RAID 0 and RAID 1, and how do the appliances use RAID?

A. RAID, which stands for Redundant Array of Independent Disks, is a technology that employs the simultaneous use of two or more hard disk drives to achieve greater levels of performance, reliability, or larger data volume sizes. Redundancy is a way that extra data is written across the array, which is organized so that the failure of one disk (or sometimes more) in the array will not result in loss of data. A failed disk may be replaced by a new one, and the data on it reconstructed from the remaining data and the extra data. A redundant array allows less data to be stored. There are various combinations of these approaches giving different trade-offs of protection against data loss, capacity, and speed. RAID levels 0, 1, and 5 are the most commonly found, and cover most

requirements. RAID 0 (striped disks) distributes data across several disks in a way that gives improved speed and full capacity, but all data on all disks will be lost if any one disk fails. RAID 1 (mirrored disks) could be described as a real-time backup solution. Two (or more) disks each store exactly the same data, at the same time, and at all times. Data is not lost as long as one disk survives. Total capacity of the array is simply the capacity of one disk. At any given instant, each disk in the array is simply identical to every other disk in the array.

The NAM 2220 Appliance uses both RAID 0 and RAID 1. RAID 0 is used on the four drives that support the storage of packet capture data. RAID 1 is used on the two drives that store the NAM operating system and reports data. The NAM 2204 Appliance does not use RAID.

Q. What is a managed device?

A. Typically, performance monitoring appliances have little to no knowledge of the devices that they are monitoring. The NAM blade on the other hand, as integrated instrumentation, automatically exchanges information with the device hosting it to learn about that device. This simplifies a number of configuration and monitoring tasks and also allows the NAM blade to provide critical health information about the hosted device. To duplicate this experience with the NAM 2200 Series Appliances, the concept of a managed device has been introduced. The managed device concept permits the creation of a communications channel between one of the devices being monitored and the NAM appliance. When a device is specified as the managed device, various configuration and monitoring tasks, such as configuring SPAN using the NAM GUI, can be more readily implemented and thus improve the user experience.

Q. What interface modules are supported for each NAM Appliances platform?

A. The interface modules supported for each NAM Appliance platform are indicated in Table 6.

Table 6. Supported Interface Modules

NAM Model	Monitoring Ports	Interface Modules PN	Description
NAM 2220	Up to two	XFP-10GBASE-SR	10 GE XFP 850 nm SR
		XFP-10GBASE-LR	10 GE XFP 1310 nm LR
NAM 2204-SFP	Up to four	GLC-T	1000BASE-T SFP
		GLC-SX-MM	GE SFP SX Transceiver
		GLC-LH-SM	GE FP LX/LH Transceiver
NAM2204-RJ45	Up to four	-	RJ45 10/100/1000

Q. Can these interface modules be mixed?

A. The interface modules can be mixed, but per platform only. For example, if a NAM2204-SFP is purchased, two GLC-Ts and two GLC-SX-MMs can also be purchased and will work with the NAM2204-SFP. However, if the same model is purchased and if two XFP-10GBASE-SRs are also purchased, these particular interface adapters will not work with this appliance model, although they'll work with the NAM 2220 model.

Q. Must I purchase the XFPs from Cisco or can I purchase them elsewhere?

A. They can be purchased elsewhere, if desired. The qualified manufacturers of the XFPs are included in Appendix B of the Installation and Configuration Guide for the Cisco NAM 2220 Appliance at http://www.cisco.com/en/US/docs/net_mgmt/network_analysis_module_appliance/2220/installation/guide/instcfg.html. It should be noted that if the XFPs are purchased from any other source but Cisco, no Cisco SMARTnet support will be provided for maintenance on these items.

Q. Can you provide more information on the use of a tap as a data source?

A. Yes. A tap device can be used to obtain a copy of traffic flows between two network devices. Passive taps, such as optical tap devices, help ensure that the flowing traffic is not altered regardless of its connection to the NAM Appliance and provide a very low point of failure. Traffic flows will be interrupted while you connect a tap, but doing so should take less than a minute and can be done during a network maintenance window. NAM Appliances are designed to receive tapped network traffic from both directions and from multiple links simultaneously, and accurately merge received traffic into a single stream for high precision analysis.

Q. What taps does Cisco recommend that I use with my NAM Appliances?

A. Cisco has tested several taps that can be used with the NAM 2204 and NAM 2220 Appliances. These taps are identified in Appendix B of the Installation and Configuration Guide for the Cisco NAM 2204 Appliance and Appendix B of the Installation and Configuration Guide for the Cisco NAM 2220 Appliance. These documents can be found at: http://www.cisco.com/en/US/docs/net_mgmt/network_analysis_module_appliance/2204/installation/guide/instcfg.html and http://www.cisco.com/en/US/docs/net_mgmt/network_analysis_module_appliance/2220/installation/guide/instcfg.html respectively. Additional taps from the same vendors or taps from other vendors may also support the NAM Appliances, but they have not specifically been tested by Cisco.

Q. Does the Cisco NAM require a separate NetFlow data collector for monitoring?

A. No. The NAM collects and consumes NetFlow data for performance monitoring purposes.

Q. How is the Cisco NAM Traffic Analyzer secured?

A. The Cisco NAM Traffic Analyzer can be secured with up to 256-bit encryption. The NAM also supports role-based user authorization and authentication locally or using TACACS+.

Q. Can multiple VLANs be spanned to the Cisco NAM?

A. Yes. The NAM is fully compatible with the Switch Monitoring (SMON) MIB and supports the monitoring of multiple VLANs.

Q. Does the NAM support Virtual Switch System (VSS) on the Catalyst 6500?

A. Yes, all Catalyst 6500 NAMs and NAM Appliances support VSS.

Q. Which NAM and Cisco IOS Software releases enable VSS support?

A. On the Catalyst 6500 NAM-1 and NAM-2, VSS is supported in NAM 3.6.1a or later with Cisco IOS Software Release 12.2(33)SXH(1) or later. On the Catalyst 6500 NAM-1-250S and NAM-2-250S, VSS is supported in NAM 3.6.1b or later with Cisco IOS Software Release 12.2(33)SXH(1) or later. On the NAM Appliances, VSS is supported in NAM 4.0 or later with Cisco IOS Software Release 12.2(33)SXH(1) or later.

Q. Are there specific capabilities that NAM provides in a VSS environment that are distinct from the capabilities provided in a non-VSS environment?

A. Yes, there are three key differentiators:

- Monitoring port statistics on both switches using one NAM. The NAM can provide mini-RMON statistics on both switches and identifies these statistics by chassis, slot, and port. In this way, a complete view of Layer 2 traffic utilization can be obtained to assist in quickly identifying potential bottlenecks.
- Leveraging SPAN on one NAM to obtain visibility into traffic on both virtual switches. Typically, RSPAN or NetFlow would need to be used to obtain visibility into the traffic running on an adjacent switch.
- Monitoring the health of both switches using a single NAM.

Q. How is the NAM appliance connected to the switch/switches in a VSS environment?

A. The NAM 2204 has four monitoring interfaces. One or more of these interfaces can be connected to one or more ports on each switch to provide full visibility. The NAM 2220 has two 10 Gigabit Ethernet monitoring interfaces. One of the two interfaces can be connected to a 10 Gigabit Ethernet port on each switch to analyze traffic from multiple VLANs/1 Gigabit Ethernet ports (spanned to the 10 Gigabit Ethernet port) in a VSS environment.

Software Features

Q. Can packet captures be saved and, if so, where?

A. Yes. The Cisco NAM offers two options to save capture data. Captures that have been stored in the NAM's buffer can be saved to the NAM's local hard drive for real-time analysis or analysis at a later date. In addition, captures can be saved directly to a remote Network File Server (NFS) or Small Computer System Interface over IP (iSCSI)–supported device. Saving captures on a remote storage device allows the user to capture very large amounts of raw data, which can then be analyzed remotely by NAM.

Q. Does the Cisco NAM perform historical traffic analysis?

A. Yes. The Cisco NAM Traffic Analyzer can display, store, and retrieve historical statistics on selected network traffic for up to 100 days. The export of historical reports can be scheduled or exported on demand. Reports can be sent by email or FTP and export formats can include CSV, XML, PDF, and HTML. In addition, standards-based applications can retrieve rich performance data from the NAM to provide enterprisewide reporting, trending, capacity planning, and baselining.

Q. Does Cisco NAM support voice monitoring for Cisco VoIP deployments only?

A. No. Cisco NAM monitors Real-Time Monitoring Protocol and thus, by extension, can provide reporting on any VoIP protocol that runs on top of RTP, a Layer 4 protocol.

Q. Which VoIP signaling protocols does the Cisco NAM support?

A. Cisco NAM supports a breadth of standards-based VoIP signaling protocols, namely, Skinny Client Control Protocol (SCCP), Session Initiation Protocol (SIP), Media Gateway Control Protocol (MGCP), and H.323.

Q. What are the key performance indicators for monitoring voice?

A. Cisco NAM offers real-time voice quality monitoring using standards-based Mean Opinion Score (MOS) and key performance indicators such as jitter and packet loss. It calculates MOS based on ITU-T G.107 recommendations.

Q. Can I identify the phones affected by voice quality degradation?

A. Yes. Cisco NAM allows the administrator to pinpoint the individual RTP stream experiencing voice quality degradation. By correlating the RTP and signaling streams, Cisco NAM can report the phone numbers and alias for each endpoint.

Q. What Cisco Unified Communications Management Solutions support NAM?

A. The solutions are Cisco Unified Service Monitor and Cisco Unified Operations Manager.

Q. What Cisco Unified Service Monitor and Cisco Unified Operations Manager versions first support NAM 4.x? Are these versions available today? If not, when will they be available?

A. The versions are Cisco Unified Service Monitor 2.2 and Cisco Unified Operations Manager 2.2. They are available as of August 2009.

Q. How do Cisco Unified Service Monitor and Cisco Unified Operations Manager support NAM?

A. Cisco Unified Service Monitor collects voice metrics from multiple NAMs to provide enterprisewide visibility into voice quality. Cisco Unified Service Monitor generates alerts on the voice quality degradation that is reported by Cisco Unified Operations Manager. Based on these alerts, Cisco Unified Operations Manager allows the user to navigate into NAM to glean near real-time views of both voice and network performance to perform rapid troubleshooting.

Q. What is the Cisco NAM IAP feature?

A. The NAM Intelligent Application Performance (IAP) feature offers comprehensive performance measurements for TCP-based applications to accurately characterize the end-user experience. This NAM 4.x feature offers a number of useful application performance indicators to facilitate faster problem identification. For example, the source of network latency affecting the end-user experience can be isolated by analyzing network delay metrics, namely client network delay, server network delay, and network delay. Similarly, server resource issues can be identified by network metrics such as application delay and server response time. In addition, the administrator can configure thresholds on these metrics to proactively detect performance degradations before they affect end users.

Q. How does Cisco NAM support Cisco WAAS?

A. Cisco NAM uses the built-in instrumentation of the Cisco Wide Area Application Engine devices as a data source to gather information on the optimized traffic to provide end-to-end application performance visibility in a Cisco WAAS environment. It measures application response time, transaction time, bandwidth usage, and LAN/WAN data, and so on to provide end-to-end application performance metrics, accurately quantifying the impact of WAAS optimization and helping to validate ongoing optimization improvements. NAM is also able to identify the applications that would benefit the most from deploying Cisco WAAS. Analyzing response time data over a period of time, the administrator can identify the applications where optimization can result in a material increase in available bandwidth.

Third-Party Reporting

Q. Does Cisco NAM include an API to allow third-party reporting applications to use NAM as a source of data?

A. Yes, the Cisco NAM includes mechanisms, such as Comma-Separated Value (CSV)/HTTP, to enable third-party reporting applications to collect data for networkwide reporting, trending, baselining, and capacity planning. The third-party applications can retrieve performance and monitoring data such as IAP, voice/video, traffic usage, and packet captures to deliver added and complementary value to NAM.

Q. How can a third party apply for approval to use the Cisco NAM CSV/HTTP API for integration?

A. A third-party can enroll in the Cisco Developer Network at http://www.cisco.com/go/cdn. During the enrollment process, the third-party must select Network and Service Management as the solution technology and Cisco NAM as the network management product for integration. Once approved and the nondisclosure agreement (NDA) and NAM developer license agreement signed, the third-party will receive the API for integration.

Q. Are there currently third parties who have joined this program? How can a list of these vendors be obtained?

A. Yes. Today, reporting applications from third-parties such as NetQoS, Compuware, and others offer support for NAM. These reporting applications complement the NAM by using its rich metrics to build end-to-end views of application usage and performance and also to streamline the number of collection points in the network. A list of third-parties supporting NAM can be found at the Cisco Developer Network URL.

Ordering

Q. What are the part numbers for the Cisco NAM Appliances?

A. Table 7 lists the part numbers for the NAM Appliances.

Table 7. Cisco NAM 2200 Series NAM Appliances Part Numbers

Part Number	Cisco NAM 2204-RJ45 Appliance
NAM2204-RJ45	Cisco NAM 2204 Appliance, four 1 Gigabit Ethernet, RJ45
NAM-APPL-SW-4.2	Cisco NAM Software 4.2 with Recovery CD
NAM2204-RAILS=	Rail Kit Four Post Spare
NAM2204-BRKTS=	Rail Kit Two Post Spare
Part Number	**Cisco NAM 2204-SFP Appliance**
NAM2204-SFP	Cisco NAM 2204 Appliance, four 1 Gigabit Ethernet, SFP
GLC-T(=)	1000BASE-T SFP (Spare)
GLC-SX-MM(=)	GE SFP, LC Connector SX Transceiver (Spare)
GLC-LH-SM(=)	GE SFP, LC Connector LX/LH Transceiver (Spare)
NAM-APPL-SW-4.2	Cisco NAM Software 4.2 with Recovery CD
NAM2204-RAILS=	Rail Kit Four Post Spare
NAM2204-BRKTS=	Rail Kit Two Post Spare
Part Number	**Cisco NAM 2220 Appliance**
NAM2220	Cisco NAM 2220 Appliance, two 10 Gigabit Ethernet
NAM2220-HDD-6X146G	Hard Disk Drive, six 146 GB
NAM2220-DIMM-16GB	RAM DIMM, 16 GB
NAM2220-AC-PS(=)	AC Power Supply (Spare)
XFP-10GBASE-SR(=)	XFP, 10 Gigabit Ethernet, Short Range (Spare)
XFP-10GBASE-LR(=)	XFP, 10 Gigabit Ethernet, Long Range (Spare)
NAM-APPL-SW-4.2	Cisco NAM Software 4.2 with Recovery CD
NAM2220-RAILS=	Rail Kit Four Post Spare
NAM2220-BRKTS=	Rail Kit Two Post Spare

Q. How can the Cisco NAM Traffic Analyzer software be obtained?

A. The NAM software can be obtained in one of two ways. To obtain the latest NAM software with your new hardware order, order NAM-APPL-SW-4.2 when ordering the NAM Appliance. The software will then be delivered preloaded on the hardware. If you already own the hardware, download the latest software from the Cisco.com Software Center using your SMARTnet access privileges.

Q. Must Cisco NAM software be downloaded from the Cisco.com Software Center when first deploying a Cisco NAM 2200 Series Appliance?

A. No. Cisco NAM comes with the latest NAM software release. There is no need to download the software when first deploying the Cisco NAM 2200 Series Appliance.

Q. How do I obtain access to a new Cisco NAM software release?

A. Customers who have purchased SMARTnet for their NAM are entitled to download new software releases from the Cisco.com Software Center.

Q. Do the Cisco NAM Appliances have their own software image? Where can I find it?

A. The Cisco NAM Appliances share a common software image that is loaded on the Cisco NAM during its manufacture. The image is also available in the Software Center on Cisco.com. When new releases are available, the NAM can be upgraded using FTP. For details regarding compatibility, download location, and so on, please see http://www.cisco.com/go/nam.

Q. How is the Cisco NAM Traffic Analyzer application obtained? Is it included in the price of the NAM?

A. The Cisco NAM Traffic Analyzer application is embedded in the NAM and is included in the NAM's price.

Q. What is required to deploy the Cisco NAM Appliance solution?

A. The following are required to deploy the NAM Appliance solution including the NAM Traffic Analyzer:

- A Cisco NAM 2220 or Cisco NAM 2204 Appliance
- NAM Software 4.0 or later
- Web browser running Microsoft Internet Explorer 6.0 (with Service Pack 2), Internet Explorer 7.0, Firefox 2.0, or Firefox 3.0

Additional Information

Q. Are any components of the NAM Appliances field-replaceable?

A. The answer depends on the appliance model. For the NAM 2204 Appliances, the answer is no. If a NAM 2204 Appliance fails, the whole box must be replaced. Interface modules, though, are field-replaceable. For the NAM 2220 Appliance, both the hard disk drive and the power supplies are field-replaceable. For example, if a power supply fails, a new one will be shipped from the services depot for replacement. Interface modules supporting the NAM 2220 are also field-replaceable.

Q. Where is additional information about the Cisco NAM 2200 Series Appliance found?

A. For more information about the NAM, visit http://www.cisco.com/go/nam or contact either your local account representative or the NAM product marketing group at nam-info@cisco.com

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV
Amsterdam, The Netherlands

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