

Cisco Branch Routers Series Network Analysis Module 3.6

Cisco® Branch Routers Series Network Analysis Module (NAM) is a powerful network-aware performance monitoring solution that delivers unparalleled insight into network traffic to help you ensure the consistent and efficient delivery of applications and services to your end users.

Product Overview

Cisco Branch Routers Series Network Analysis Module (Figure 1) is designed to give you more visibility into your branch than ever before. It shows you how the network is being used and how your users experience the services the network offers to help you improve the performance of your empowered branch. Because Cisco NAM provides visibility for comprehensive performance analysis and simplified troubleshooting, it is ideally suited for today's dynamic, evolving enterprises.

The innovative design of Cisco NAM combines a rich set of embedded data collection and analysis capabilities with a remotely accessible, web-based management console, all of which reside on a single network module that is installed into Cisco 3900 Series, Cisco 2900 Series, Cisco 2800 Series or Cisco® 3800 Series Integrated Services Routers (ISRs), or Cisco® 3700 Series Multiservice Access Routers (MSRs). Cisco NAM includes a Traffic Analyzer GUI, which provides quick access to the configuration menus and presents easy-to-read performance reports on web, voice, and video traffic.

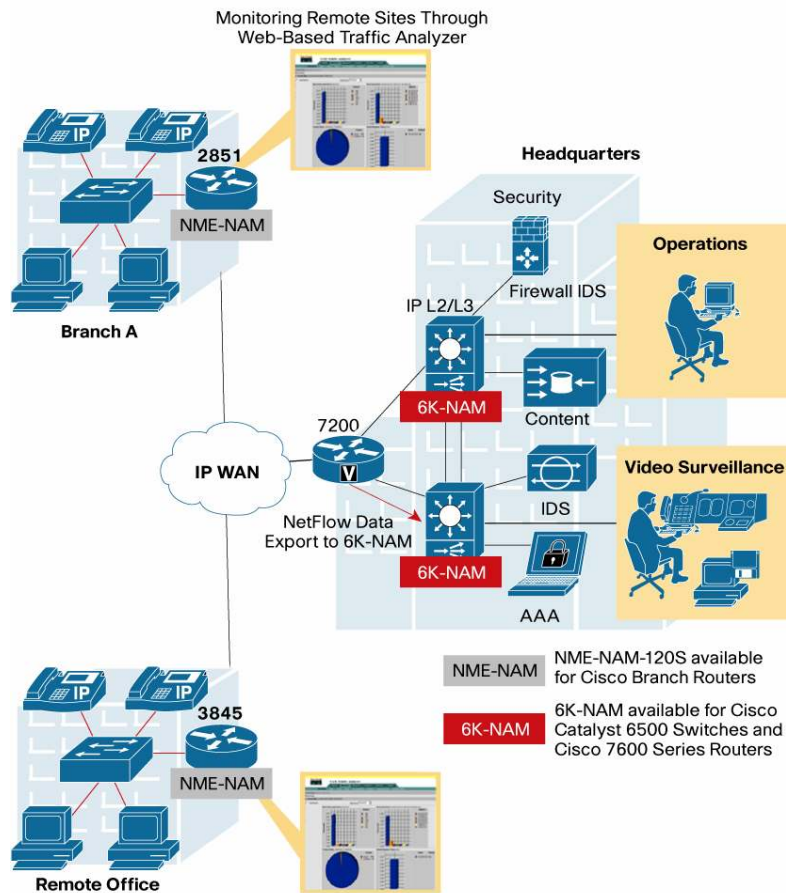
Figure 1. Cisco Branch Routers Series NAM, NME-NAM



Integrated WAN and LAN Monitoring in the Empowered Branch

Cisco Branch Routers Series NAM is deployed in the Cisco 2800, 2900, 3700, 3800 and 3900 Series Routers. It uses Cisco IOS® Software features, such as Cisco NetFlow, from both local and remote routers and switches to provide insight into network traffic in the empowered branch. In addition, Cisco NAM can analyze traffic from LAN ports on the router or from a nearby switch to further extend network visibility. Figure 2 highlights the deployment of Cisco Branch Routers Series NAM and Cisco Catalyst® 6500 Series NAM to improve network and application performance from the branch to the data center.

Figure 2. Deploying the Cisco Branch Routers Series NAM to Build Intelligence into Branch Office Networks



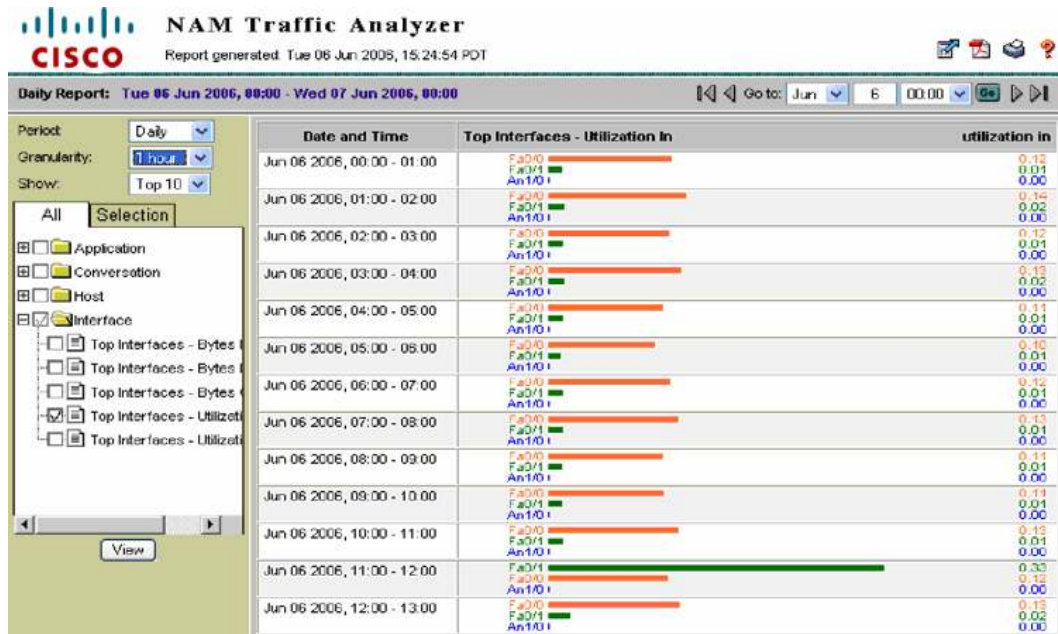
Key Applications

Monitoring WAN Usage at the Application Layer

One of the foundations of Cisco NAM is its ability to look inside the live packet to gather information on applications, hosts, and conversations. Application monitoring identifies every application that has consumed bandwidth, reports how much bandwidth has been consumed, and detects which hosts are using which applications. Host and conversation-pair monitoring provides bandwidth consumption per host and shows you which hosts are talking to each other along with the amount of traffic each host is generating. Monitoring application, hosts, and conversations can help you proactively spot bottlenecks before your network suffers blows to performance and availability. It can also help you improve WAN traffic performance, since these metrics reveal usage patterns for users as well as for router and switch, interface, server, and application resources.

Besides delivering a real-time snapshot of bandwidth usage and consumption, Cisco NAM also delivers a continuous historical view of how the bandwidth was used so you can quickly decide when and where to make changes in network resources. Data can also be collected over a select period of time and then analyzed after the event to discover when an anomaly has occurred so it can be quickly resolved (Figure 3).

Figure 3. Monitoring the Top Interfaces on the Router

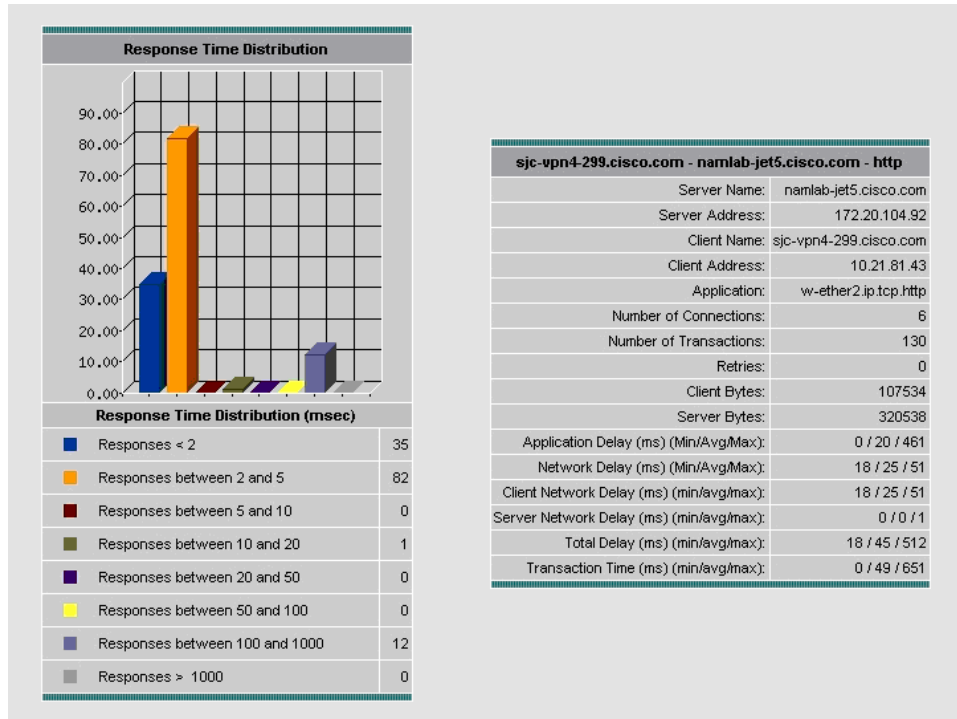


Improving How Users Experience Application Performance

Cisco Branch Routers Series NAM provides essential information on application performance as experienced by the clients in branch offices. With Cisco NAM's new transaction-aware application response time feature, Cisco NAM can isolate application performance problems to the network, the application, or the server. Having these measurements that reflect the users' experience of network performance helps to quickly identify the source of performance degradation and resolve problems before users even notice.

Cisco NAM collects response-time statistics for TCP-based client/server requests to provide important latency data. This data can also be trended over time. Thus, changes in network and application usage can be correlated with fluctuations in response times to predict how changes in user populations or in WAN bandwidth management will affect application performance (Figure 4).

Figure 4. Application Response Time Monitoring



Identifying the Opportunity for WAN Optimization

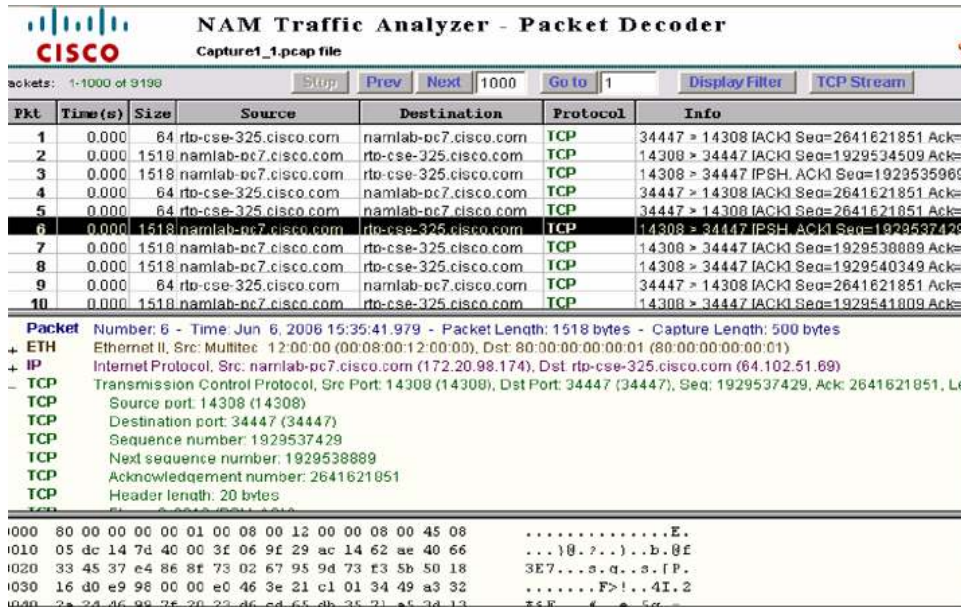
Cisco Wide Area Application Services (WAAS) is a powerful application acceleration and WAN optimization solution that facilitates branch office server consolidation, performance improvements for centralized applications and services, and LAN-like service levels for remote users by mitigating application and transport latency, improving throughput, and minimizing WAN bandwidth consumption for all TCP-based applications.

Cisco NAM provides visibility into WAN application traffic, detecting applications, the amount of bandwidth they consume, and the users that consume costly WAN resources. Complementing this capability is NAM’s ability to track application response times to reveal how each application is performing and whether slow application response time is the cause of a performance problem. This information can help in identifying the opportunity for WAN optimization and the applications that can benefit the most. Application response time measurements can also be taken after optimizations are applied to compare actual application performance with the performance that was expected.

Simplifying Problem Detection and Resolution

Using Cisco Branch Routers Series NAM, thresholds and alarms can be set on various network parameters, such as increased utilization, severe application response delays, and voice quality degradation, and alerts can be generated on potential problems. When a potential problem is identified, the packet can be automatically captured and decoded to help resolve the problem before it affects users. Captures can be performed using a web browser from any desktop, and decodes can be viewed through the Traffic Analyzer GUI while the data is still being captured. Cisco NAM’s capture and decode capability provides depth and insight into data analysis using trigger-based captures, filters, decodes, and a capture analysis toolset to quickly pinpoint and resolve problem areas (Figure 5).

Figure 5. Capturing and Decoding Packets with Cisco Branch Routers Series NAM

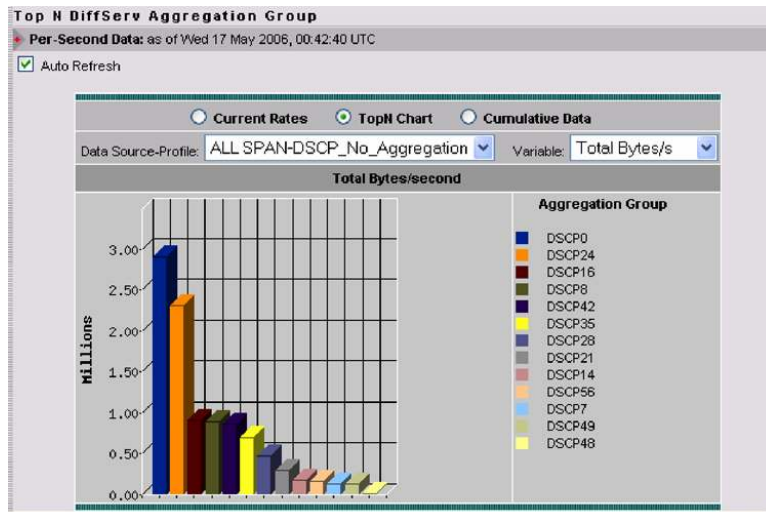


Analyzing Voice, Video, and Quality of Service

Cisco NAM can analyze how users experience voice and video services. It can monitor voice traffic flows in near real time to collect critical performance information, including call setup details and voice quality metrics, and can generate alerts when voice quality degrades. It can also monitor video packet quality to help assure a high rate of packet delivery so users get the quality they expect and demand.

Cisco NAM supports both the planning and management of quality of service (QoS) deployments for voice and other critical IP-based services. It supports the Differentiated Services Monitoring (DSMON) MIB, which monitors traffic by differentiated services code point (DSCP) allocations defined by QoS policies. Using Cisco NAM's DiffServ monitoring capabilities, applications, hosts, and conversations participating in each grouping of DiffServ classes can be identified. This information can be used to validate and tune planning assumptions and QoS allocations. It can also be used to detect incorrectly marked or unauthorized traffic (Figure 6).

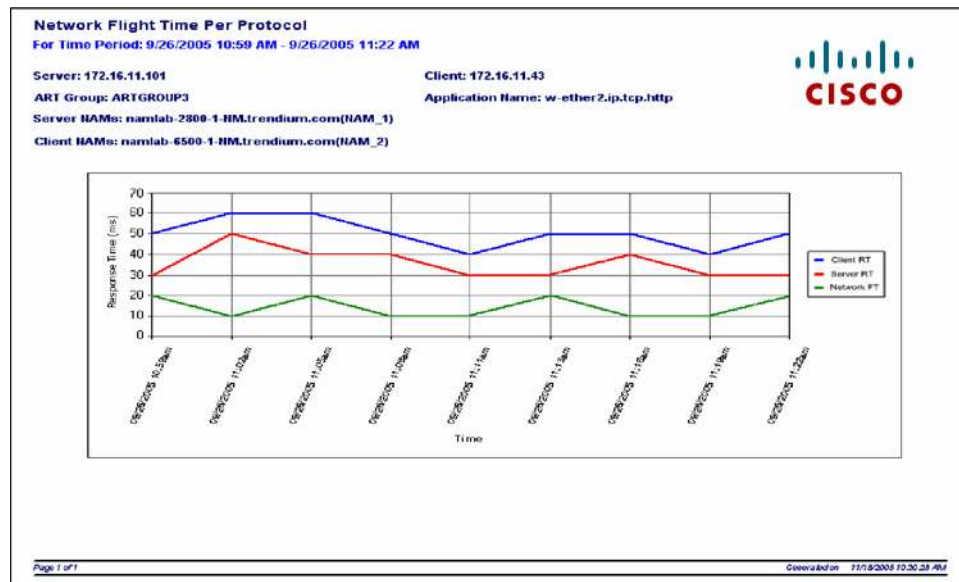
Figure 6. QoS Monitoring Using DSMON



Putting It All Together: Performance Assurance Enterprisewide

Data from Cisco Branch Routers Series NAMs and from Cisco Catalyst 6500 Series and Cisco 7600 Series NAMs deployed across the network can be collected by the Linux-based Cisco Performance Visibility Manager (PVM) software application to provide performance assurance enterprisewide. Cisco PVM collects data from Cisco NAMs to provide an intuitive and integrated end-to-end view of network traffic, protocol types, and application and host bandwidth usage. It provides a centralized view of application performance, correlates application response times, localizes the cause of application performance problems, and accounts for the impact of other traffic on application performance (Figure 7). Both Cisco NAM and Cisco PVM are core components of the Cisco Network and Application Performance Analysis (NAPA) solution, a comprehensive set of tools and services designed to optimize performance and streamline troubleshooting of your applications and network.

Figure 7. Using Cisco PVM to View Application Response Time Data Collected from Cisco NAMs



Business Benefits

Many users don't think twice about how they get their data, whether it is text, voice, or video—so long as they can get it and get it quickly. However, networks that offer limited or no visibility into network and application usage and the user's experience of the network can lead to downtime and loss of access to important data, making users painfully aware that their data depends on a network. And every problem, no matter how small, will now be blamed on the network, amplifying the need for performance monitoring.

With Cisco NAM, your key to decision making is the visibility within the network. A well-planned and executed performance monitoring strategy using Cisco NAMs provides users with consistent and secure network services, increasing productivity. The analytics that Cisco NAM provides can also be used to improve return on network investment and quantify change—leading to an overall increase in network reliability, security, and effectiveness, as well as cost savings.

Supported Router Platforms

The Cisco Branch Routers Series NAM, models NME-NAM-80S and NME-NAM-120S, can be deployed in any network module slot in the Cisco router platforms indicated in Table 1. An NM Adapter Card is required to successfully integrate the NME-NAM into supported ISR G2 platforms. The NME-NAM supports the router platforms with NAM software version 3.6.1b or later. Only one Cisco NAM can be installed in each Cisco branch router.

Table 1. NME-NAM Supported Router Platforms

Router Platform	Minimum Cisco IOS Software Version Required	NM Adapter Card Required
Cisco 3945 ISR	Cisco IOS Software 15.0(1)M	Yes
Cisco 3925 ISR	Cisco IOS Software 15.0(1)M	Yes
Cisco 2951 ISR	Cisco IOS Software 15.0(1)M	Yes
Cisco 2921 ISR	Cisco IOS Software 15.0(1)M	Yes
Cisco 2911 ISR	Cisco IOS Software 15.0(1)M	Yes
Cisco 3845 ISR	Cisco IOS Software 12.4(9)T	No
Cisco 3825 ISR	Cisco IOS Software 12.4(9)T	No
Cisco 2851 ISR	Cisco IOS Software 12.4(9)T	No
Cisco 2821 ISR	Cisco IOS Software 12.4(9)T	No
Cisco 2811 ISR	Cisco IOS Software 12.4(9)T	No
Cisco 3745 MSR	Cisco IOS Software 12.4(9)T	No
Cisco 3725 MSR	Cisco IOS Software 12.4(9)T	No

Cisco Branch Routers Series NAM Software License Options

Cisco NAM offers two license options for monitoring voice traffic. One license allows the monitoring of 50 voice (RTP) streams; the other, the monitoring of 100 voice streams. Both license options are supported on Cisco Branch Routers Series NAM, NME-NAM-120S.

Product Specifications

Table 2 provides the specifications for Cisco Branch Routers Series NAM, NME-NAM-120S.

Table 2. Product Specifications

Product	Description
Hardware architecture	1.0 GHz Intel Celeron M CPU with 1 GB RAM and a 120 GB hard disk drive
Monitoring interfaces	Two monitoring interfaces: one internal backplane interface for receiving a copy of LAN or WAN traffic through a special packet-monitoring feature in the router's Cisco IOS Software and one external Gigabit Ethernet interface for receiving traffic directly from local or remote LAN ports. Either can be used for management traffic and for receiving NetFlow data.
Performance	Using the internal monitoring interface, traffic monitoring throughput of up to 100 Mbps has been characterized for the NME-NAM-120S installed in Cisco 3900 Series and Cisco 3800 Series Integrated Services Routers, and up to 45 Mbps in Cisco 2900 Series and Cisco 2800 Series Integrated Services Routers. The external monitoring interface has been characterized to support up to 200 Mbps throughput monitoring. Your monitoring performance may differ based on factors such as packet size, traffic burstiness, collections enabled on the NAM, and features enabled on the router. Contact your Cisco sales representative to obtain further information about NME-NAM-120S performance characteristics.
Topologies and data sources: WAN	Packets on WAN interfaces are copied by a special packet-monitoring feature in Cisco IOS Software using Cisco Express Forwarding and sent to Cisco NAM through the internal backplane interface for analysis at the IP layer and up. NetFlow (versions 1, 5, 6, 7, 8, and 9) data from local and remote devices is sent through the internal or external interface.
Topologies and data sources: LAN	An external Gigabit Ethernet interface receives packets directly from local and remote LAN ports. NetFlow (versions 1, 5, 6, 7, 8, and 9) data from local and remote devices is sent through the internal or external interface.
Interfaces and external applications	<ul style="list-style-type: none"> • HTTP and HTTPS with the embedded web-based NAM Traffic Analyzer • SNMP versions 1 and 2c with other standards-based applications
NAM Traffic Analyzer	<ul style="list-style-type: none"> • Embedded in Cisco NAM Software 3.6 • Web-based: Requires Microsoft Internet Explorer 6.0 (minimum), Mozilla 1.7 (minimum), or Firefox 1.5 (minimum); supports both English and Japanese versions of browsers • Supports Secure Sockets Layer (SSL) security with up to 168-bit encryption • Role-based user authorization and authentication locally or using TACACS+ • Real-time and historical statistics (up to 100 days) on LAN and WAN traffic and network-based services
Cisco NAM Software 3.6	Supports Cisco Branch Routers Series NAM, NM-NAM, NME-NAM-80S and NME-NAM-120S

MIBs	<p>Cisco NAM is standards-compliant and supports RMON and RMON2 MIBs as well as several extensions; major MIB groups supported in the Cisco NAM are:</p> <ul style="list-style-type: none"> • MIB-II (RFC 1213) • RMON (RFC 2819) • RMON2 (RFC 2021) • DSMON (RFC 3287) • HC-RMON (RFC 3273) • NBAR-Protocol Directory • Application Response Time
Protocols	<ul style="list-style-type: none"> • Cisco NAM provides RMON2 statistics on several hundred unique protocols, including those defined in RFC 2896, and several Cisco proprietary protocols. • Automatically detects unknown protocols. • Users have the flexibility to customize the protocol directory by defining protocols on a single port or on a range of ports. • Supports protocols discovered using Cisco NBAR-PD MIB in Cisco IOS Software (requires Cisco IOS Software Release 12.3(7)T or later). • Protocols supported include (this list is not all-inclusive): <ul style="list-style-type: none"> ◦ TCP and User Datagram Protocol (UDP) over IP including IPv6 ◦ HTTP and HTTPS ◦ Voice over IP (VoIP) including Skinny Client Control Protocol (SCCP), Real Time Protocol/Real Time Control Protocol (RTP/RTCP), Media Gateway Control Protocol (MGCP), and Session Initiation Protocol (SIP) ◦ Mobile IP protocols ◦ Storage area network (SAN) protocols including Fibre Channel over TCP/IP ◦ AppleTalk, DECnet, Novell, Microsoft ◦ Database protocols, including Oracle and Sybase ◦ Peer-to-peer protocols such as Gnutella, FastTrack, and WinMX ◦ Bridge and router protocols ◦ Cisco proprietary protocols such as Cisco Discovery Protocol ◦ Unknown protocols by TCP/UDP ports, Remote Procedure Call (RPC) program numbers, and so on
Physical dimensions	<ul style="list-style-type: none"> • Dimensions (H x W x D): 1.55 x 7.10 x 7.2 inches (3.9 x 18.0 x 18.3 centimeters) • Weight: 1.5 pounds (0.7 kilograms) maximum
Operating environment	<ul style="list-style-type: none"> • Operating temperature: 41 to 104°F (5 to 40°C) • Nonoperating and storage temperature: -40 to 158°F (-40 to 70°C) • Operating humidity: 5 percent to 85 percent (noncondensing) • Operating altitude: -197 ft to 6000 ft (-60 to 1800 m)
Safety	<ul style="list-style-type: none"> • UL 60950-1, Second Edition Safety of Information Technology Equipment – Safety – Part 1: General Requirements (USA). Plastic materials that are exposed to the end user shall meet the requirements of fire enclosure (UL94V-1) as defined in UL 60950. • CSA 60950-1, Second Edition, Safety of Information Technology Equipment – Safety – Part 1: General Requirements (Canada) • IEC 60950-1, Second Edition, Safety of Information Technology Equipment – Safety – Part 1: General Requirements, including all national deviations as specified in the current CB Bulletin; • EN 60950-1, Second Edition, Safety of Information Technology Equipment – Safety – Part 1: General Requirements (European Union) incorporating all deviations, as applicable. • GB 4943-95, Safety of Information Technology Equipment (Including Electrical Business Equipment) (standard for China, equivalent to IEC 60950) • AS/NZ 60950.1 Information Technology Equipment, Safety Part 1: General Requirements (Australia)
Compliance	<ul style="list-style-type: none"> • Emission: <ul style="list-style-type: none"> ◦ 47 CFR Part 15 Class A ◦ CISPR22 Class A ◦ EN300386 Class A ◦ EN55022 Class A ◦ EN61000-3-2 ◦ EN61000-3-3 ◦ VCCI Class I ◦ AS/NZS CISPR 22 Class A • Immunity: <ul style="list-style-type: none"> ◦ CISPR24 ◦ EN300386 ◦ EN50082-1 ◦ EN55024 ◦ EN61000-6-1

Ordering Information

Customers can order the spare NME-NAM-120S= and the new voice licenses today. The system NME-NAM-120S will be orderable starting on November 10, 2008. To place an order, visit the [Cisco Ordering Homepage](#). Table 3 provides ordering information for Cisco Branch Routers Series NAM.

Table 3. Ordering Information for Cisco Branch Routers Series NAM

Product Name	Part Number
Cisco Branch Routers Series Network Analysis Module (Spare)	NME-NAM-120S(=)
Cisco Branch Routers Series Network Analysis Module Software 3.6	NME-NAM-SW-3.6
Voice Monitoring Software License for NME-NAM-120S, 50 RTP Streams (Spare)	SNAM-50VOICE(=)
Voice Monitoring Software License for NME-NAM-120S, 100 RTP Streams (Spare)	SNAM-100VOICE(=)
NM Adapter Card for integration of NME-NAM into supported ISR G2 platforms (Spare)	SM-NM-ADPTR(=)

Service and Support

Cisco offers a range of services programs to accelerate customer success. These innovative services programs are delivered through a unique combination of people, processes, tools, and partners, resulting in high levels of customer satisfaction. Cisco Services help to protect your network investment, optimize network operations, and prepare the network for new applications to extend network intelligence and the power of your business. For more information about Cisco Services, see [Cisco Technical Support Services](#). Service and support for Cisco Branch Routers Series NAM is covered under the service contract for the router platform.

For More Information

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



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