

## Cisco Branch Routers Series Network Analysis Module 4.0

### Overview

**Q. What is Cisco® Branch Routers Series Network Analysis Module (NAM)?**

**A.** Cisco Branch Routers Series NAM is a powerful network-aware performance monitoring solution that delivers unparalleled insight into application performance and network traffic to help ensure the consistent and efficient delivery of applications and services to end users. It provides visibility into the applications running on the network, how the network resources are being utilized, and how the users experience the services being delivered over the network. It enhances the performance of the empowered branch with integrated manageability, improved service quality, and operational effectiveness.

The unique design of Cisco NAM combines a rich set of embedded data collection capabilities and performance analytics 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 3800 Series or Cisco 2800 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 both real-time and historical performance reports.

**Q. What are the key features and benefits of Cisco Branch Routers Series NAM?**

**A.** Table 1 lists the key features and benefits.

**Table 1.** Key Features of Cisco Branch Routers Series NAM

Feature	Description
<b>Application performance monitoring</b>	Offers application performance monitoring and real-time visibility for voice, video, and data applications. Cisco NAM helps improve the operational efficiency of IT organizations by helping enable them to proactively detect performance degradation, quickly identify its source, and troubleshoot the underlying issues.
<b>Transaction-aware application response time monitoring</b>	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.
<b>Cisco Wide Area Application Services (WAAS) support</b>	Provides end-to-end application performance visibility in a WAAS deployment. It measures and reports on application response time, WAN bandwidth usage, LAN/WAN data throughput among a number of other performance metrics.
<b>Voice-over-IP (VoIP) and video packet quality analysis</b>	Analyzes voice and video packet streams and provides visibility into key network performance indicators to maximize the quality of the user experience.
<b>Comprehensive flow-based monitoring</b>	Automatically identifies hundreds of protocols and provides real-time and historical performance reports on hosts, conversations, and applications using critical network resources.
<b>LAN and WAN monitoring in one solution</b>	Provides visibility into traffic from local and remote switches and routers for comprehensive traffic monitoring.
<b>Web-based captures for deep, insightful data analysis</b>	Captures the packets to help resolve acute problems before they affect users. Captures can be performed using a web browser from any desktop, and the 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.
<b>Anytime, anywhere access</b>	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.
<b>Pre- and postdeployment metrics to quantify business changes</b>	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.
<b>Secure solution</b>	Offers TACACS+, Secure Sockets Layer (SSL), and Secure Shell (SSH) Protocol-based security.
<b>Deployment flexibility</b>	Cisco NAM can be deployed in blade form factor in Cisco Catalyst® 6500 Series Switches, Cisco 7600 Series Routers, and Cisco Integrated Services Routers, and as a multigigabit appliance. This complement of blades and appliances allows NAM instrumentation to be broadly deployed in the network for comprehensive performance monitoring.

**Q. What are the business benefits of deploying Cisco Branch Routers Series NAM?**

**A.** Table 2 summarizes the business benefits that Cisco Branch Routers Series NAM offers.

**Table 2.** Business Benefits of Cisco Branch Routers Series NAM

Benefit	Description
<b>Improve application performance</b>	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 Wide Area Application Services (WAAS).
<b>Manage application delivery</b>	Use the combination of application performance monitoring, traffic analysis, and advanced troubleshooting for managing effective and reliable delivery of applications in the empowered branch.
<b>Increase operational efficiency</b>	Accelerate problem isolation and minimize the amount of time IT dedicates to constantly troubleshooting problems.
<b>Enhance service levels delivered to end users</b>	Preempt performance issues with threshold-based proactive alerts. Reduce downtime and failures.
<b>Improve network security</b>	Prevent unauthorized or frivolous use of network resources.

**Q. How does Cisco Branch Routers Series NAM work?**

**A.** Cisco Branch Routers Series NAM receives copies of packets in a passive or promiscuous mode from the router backplane or from an external Gigabit Ethernet interface. The NAM parses the packets and extracts data to populate standards-based management information bases (MIBs) included in the NAM such as remote monitoring (RMON/RMON2) and RMON extensions. The MIBs 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 or can be accessed using a standards-based centralized Simple Network Management Protocol (SNMP) console.

**Q. What is Cisco NAM Traffic Analyzer?**

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

**Q. Where is Cisco Branch Routers Series NAM deployed?**

**A.** Cisco Branch Routers Series NAM is deployed in the Cisco 2800, 2900, 3700, 3800, and 3900 Series Routers at WAN edges or at remote branch offices. It uses features of both local and remote switches and routers to provide combined visibility into WAN and LAN traffic in the empowered branch. Traffic from selected WAN ports can be copied by the router using a special packet-monitoring feature in Cisco IOS® Software and then sent by an internal backplane interface to Cisco NAM for analysis. Traffic from LAN ports in the router or from nearby switches can be sent to Cisco NAM through an external Gigabit Ethernet interface. By using the web-based Traffic Analyzer embedded in Cisco NAM, network managers can perform remote traffic analysis, performance monitoring, and troubleshooting without having to send personnel to remote offices or haul large amounts of data across the WAN to the central site.

**Q. What branch router models support the second-generation Cisco Branch Routers Series NAM?**

**A.** The second-generation Cisco Branch Routers Series NAM, NME-NAM-80S and NME-NAM-120S, is supported on the branch router models indicated in Table 3. An NM Adapter Card, SM-NM-ADPTR(=), is required to successfully integrate the NME-NAM into Cisco 2900 Series and Cisco 3900 Series ISRs.

**Table 3.** NME-NAM Supported Router Models

Router Models	NM 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

**Q. Are maintenance services for Cisco Branch Routers Series NAM purchased separately or are they included in the router's maintenance services?**

**A.** Maintenance services for Cisco Branch Routers Series NAM are included with the purchase of maintenance services for the router in which Cisco Branch Routers Series NAM is hosted.

#### NAM 4.0

**Q. What features does NAM Software 4.0 offer?**

**A.** Cisco NAM 4.0 offers the features described in Table 4.

**Table 4.** Features in Cisco NAM 4.0

Feature	Benefit
<b>NAM 2200 Series Appliances</b>	An extension of the NAM family of modules, the NAM 2200 Series Appliances offer high-performance monitoring, large onboard storage, and maximum deployment flexibility. They increase the reach of the NAM in places in the network either not currently served by the blades or where higher performance monitoring is essential.
<b>Intelligent application performance (IAP) analytics</b>	Provides comprehensive application performance measurements to reflect the true end-user experience. Intelligence derived from integrated application and network visibility helps assure the effective and reliable delivery of the applications that make up the business.
<b>Superior voice quality monitoring</b>	Provides standards-based voice quality in real time using Mean Opinion Score (MOS) and key performance indicators such as jitter and packet loss. Superior voice characterization along with real-time troubleshooting improves the quality of voice services committed to the end user.
<b>Integration with Cisco Unified Communications Management Suite</b>	Offers scalable and flexible deployment options complementing Cisco Unified Communications Management Suite with networkwide visibility allowing active enforcement of enterprisewide service quality objectives.
<b>Visibility into WAN-optimized networks (WAAS deployments)</b>	Measures the impact of WAAS on application performance. Identifies the applications where WAN optimization and application acceleration services can be most beneficial in improving application performance. Provides end-to-end application performance visibility critical for ongoing optimization improvements and resolving problems related to application performance degradation.

**Q. Which NAM hardware platforms are recommended for software release 4.0?**

**A.** For optimal performance Cisco NAM Software 4.0 is recommended on the NAM platforms listed in Table 5, although it is supported on all shipping NAM platforms as well as on NM-NAM.

**Table 5.** NAM Hardware Platforms Recommended for NAM Software 4.0

Hardware Part number	Description
All NAM 2200 Series Appliances	Cisco NAM Appliances
WS-SVC-NAM-1-250S	Cisco Catalyst 6500 Series and Cisco 7600 Series NAM-1
WS-SVC-NAM-1 with MEM-C6KNAM-2GB=	
WS-SVC-NAM-2-250S	Cisco Catalyst 6500 Series and Cisco 7600 Series NAM-2
WS-SVC-NAM-2 with MEM-C6KNAM-2GB=	
NME-NAM-120S	Cisco Branch Routers Series NAM

**Q. Does Cisco NAM 4.0 support voice monitoring for Cisco VoIP deployments only?**

**A.** No. Cisco NAM Software 4.0 can monitor any VoIP deployment based on standard Real-time Transport Protocol (RTP) implementation.

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

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

**Q. Does Cisco NAM 4.0 include an API to allow partner reporting applications to use NAM as a data source?**

**A.** Yes, The Cisco NAM includes multiple mechanisms, such as SNMP and comma-separated value (CSV)/HTTP, that allow third-party management applications to retrieve data for networkwide reporting, trending, baselining, and capacity planning. The reporting application can retrieve monitoring data such as Application Response Time (ART), RMON, DiffServ, and Differentiated Services Monitoring (DSMON). To access the CSV/HTTP API, the partner must be a member of the Cisco Technology Developer Program and must apply for Cisco NAM as the product for integration.

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

**A.** A partner can enroll in the Cisco Technology Developer Program at <http://www.cisco.com/go/ctdp>. During the enrollment process, the partner must select Network and Service Management as the solution technology and Cisco NAM as the network management product for integration. Once the partners are approved and have signed the nondisclosure agreement (NDA) as well as the NAM developer license agreement, they will receive the API for integration.

**Hardware Features****Q. How does the router send traffic to the Cisco Branch Router Series NAM internal interface?**

**A.** The host router forwards traffic from user-selected interfaces to Cisco NAM using the router's internal PCI bus. Both inbound and outbound traffic are forwarded to Cisco NAM.

**Q. Can Cisco Branch Routers Series NAM monitor traffic on multiple LAN or WAN interfaces simultaneously?**

**A.** Yes, it can be used to monitor traffic from multiple interfaces within the router. Traffic statistics are processed and displayed using the following data sources on the module: NetFlow-based data sources and the two Cisco NAM interfaces -- internal and external.

**Q. Can packets be sent to the NAM before the traffic is encrypted (that is, IPsec) on the interface that I wish to monitor?**

**A.** Yes. Packets are copied to the NAM by the Cisco Express Forwarding. If the router is the endpoint of the IPsec tunnel, the packets will be decrypted before they reach Cisco Express Forwarding; the outgoing packets will be processed by Cisco Express Forwarding before they're encrypted. In this scenario Cisco Express Forwarding can copy those (decrypted) packets to the NAM for analysis.

- Q. Is Cisco Branch Routers Series NAM restricted to a particular slot in the branch router chassis?**
- A.** No. Cisco NAM can be inserted into any of the network module slots in the branch router chassis. Only one Cisco NAM is supported in each chassis.
- Q. Is Cisco Branch Routers Series NAM compatible with all other network modules, WAN interface cards (WICs), and advanced integration modules (AIMs) that can reside in the branch routers?**
- A.** Yes. Cisco NAM is compatible with the other network modules, WICs, and AIMs offered for the Cisco® 2800, 2900, 3700, 3800, and 3900 Series Routers.
- Q. Is Cisco Branch Routers Series NAM hot-swappable?**
- A.** Yes, on online insertion and removal (OIR)-capable router platforms.
- Q. Should Cisco Branch Routers Series NAM fail, will network traffic be affected?**
- A.** No. Failure of Cisco NAM will not affect network traffic.
- Q. What are the hardware specifications of Cisco Branch Routers Series NAM?**
- A.** Table 6 lists the hardware specifications for Cisco Branch Routers Series NAM.

**Table 6.** Hardware Specifications of Cisco Branch Routers Series NAM

Hardware Feature	Specifications
Processor	1.0 GHz Intel Celeron M CPU
Synchronous dynamic RAM (SDRAM)	1 GB
Internal disk storage	120 GB 24x7 SATA hard disk drive
Network interfaces	One internal Gigabit Ethernet port to router backplane, plus one external Gigabit Ethernet port
Flash memory	64 MB internal

## Software Features

- Q. What release of Cisco IOS Software is required to support Cisco Branch Routers Series NAM?**
- A.** The minimum Cisco IOS Software required will depend on the router model in which the NME-NAM is installed. Table 7 summarizes the Cisco IOS Software requirements to support NME-NAM.

**Table 7.** Cisco IOS Software Requirements to Support NME-NAM

NME-NAM Installed in:	Minimum Cisco IOS Software Version Required
Cisco 3945 ISR	Cisco IOS Software 15.0(1)M
Cisco 3925 ISR	Cisco IOS Software 15.0(1)M
Cisco 2951 ISR	Cisco IOS Software 15.0(1)M
Cisco 2921 ISR	Cisco IOS Software 15.0(1)M
Cisco 2911 ISR	Cisco IOS Software 15.0(1)M
Cisco 3845 ISR	Cisco IOS Software 12.4(9)T
Cisco 3825 ISR	Cisco IOS Software 12.4(9)T
Cisco 2851 ISR	Cisco IOS Software 12.4(9)T
Cisco 2821 ISR	Cisco IOS Software 12.4(9)T
Cisco 2811 ISR	Cisco IOS Software 12.4(9)T
Cisco 3745 MSR	Cisco IOS Software 12.4(9)T
Cisco 3725 MSR	Cisco IOS Software 12.4(9)T

- Q. What Cisco NAM software version does the latest Cisco Branch Routers Series NAM, NME-NAM-120S, support?**
- A.** The Cisco Branch Routers Series NAM, NME-NAM-120S, is first introduced in Cisco NAM Software 3.6.1b. It supports NAM Software 3.6.1b or later.
- Q. Must Cisco NAM software be downloaded from the Cisco.com Software Center when first deploying a Cisco Branch Routers Series NAM?**
- A.** No. Cisco NAM comes with the latest NAM software release. There is no need to download the software when first deploying Cisco Branch Routers Series NAM.
- Q. How do I obtain access to a new Cisco NAM software release?**
- A.** Customers who have purchased SMARTnet<sup>®</sup> for the router in which Cisco NAM is installed will be entitled to download new software releases from the Cisco.com Software Center. In addition, customers who have purchased a Voice Monitoring license will be entitled to use the voice monitoring functionality included in the new software releases. Specific instructions on how to upgrade NAM software can be found in the Cisco Branch Routers Series NAM Installation and Configuration Note found on Cisco.com.
- Q. What components are required to implement a network monitoring solution with Cisco Branch Routers Series NAM?**
- A.** The following are required to implement Cisco Branch Routers Series NAM, including NAM Traffic Analyzer:
- Cisco 2800, 3700, or 3800 Series Router running Cisco IOS Software Release 12.4(9)T or later, or Cisco 2900 or 3900 Series ISR running Cisco IOS Software Release 15.0(1)M or later
  - Cisco Branch Routers Series NAM, NM-NAM, NME-NAM-80S, or NME-NAM-120S, running Cisco NAM Software 4.0
  - Web browser running Microsoft Internet Explorer 6.0 (with Service Pack 2), Internet Explorer 7.0, or Firefox 2.0
  - Voice Monitoring Software license for NME-NAM-120S if monitoring RTP streams (voice) is desired. Two licenses are offered, one enabling the monitoring of 50 RTP streams; the other of 100 RTP streams.
  - NM Adapter Card for integration of NME-NAM into Cisco 2900 or 3900 Series ISR
- Q. How can the Cisco NAM Traffic Analyzer application be obtained?**
- A.** The Cisco NAM Traffic Analyzer application is embedded in Cisco NAM.
- Q. Are all of the features included in Cisco Catalyst 6500 Series and Cisco 7600 Series NAMs also included in Cisco Branch Routers Series NAM?**
- A.** All of the Cisco NAMs offer a common user experience, but some functional disparities exist because of the distinctions in the capabilities of both the host platforms and the NAM hardware platforms. For example, Remote SPAN (RSPAN) and Encapsulated RSPAN (ERSPAN) configurations are unique to the Catalyst switches and are not supported on the branch routers.
- Q. What versions of NetFlow does Cisco Branch Routers Series NAM support?**
- A.** Cisco NAM supports versions 1, 5, 6, 7, 8, and 9.
- Q. Can NetFlow Data Export (NDE) be collected from remote WAN routers?**
- A.** Yes, Cisco Branch Routers Series NAM can collect and analyze NDE from remote devices, including WAN routers.

**Q. Can historical traffic analysis be performed with Cisco Branch Routers Series NAM?**

- A.** Yes. Cisco NAM Traffic Analyzer can display, store, and retrieve historical statistics on selected network traffic for up to 100 days.

In addition, historical reports can be exported either on demand or as scheduled. Cisco NAM also can serve as a rich source of data, “feeding” third-party reporting applications to provide historical analysis beyond 100 days. These applications use the data collected by Cisco NAM to perform networkwide reporting, trending, and baselining.

**Q. How is Cisco NAM Traffic Analyzer secured?**

- A.** The Cisco NAM Traffic Analyzer can be secured with up to 168-bit encryption. This requires users to download a K9-designated patch for the NAM software from the Cisco.com Software Center. Cisco NAM also supports role-based user authorization and authentication locally or using TACACS+.

**Q. What MIBs are supported on Cisco Branch Routers Series NAM?**

- A.** Cisco Branch Routers Series NAM is standards-compliant and supports RMON and RMON2 MIBs, as well as several extensions. The major MIB groups supported in Cisco Branch Routers Series NAM include the following:
- MIB-II (RFC 1213)
  - RMON (RFC 2819)
  - RMON2 (RFC 2021)
  - DSMON (RFC 3287)
  - HC-RMON (RFC 3273) (High-Capacity RMON)
  - NBAR-PD
  - ART (Application Response Time) extension

**Specifications****Q. What are the physical specifications of Cisco Branch Routers Series NAM?**

- A.** Table 8 provides the physical specifications.

**Table 8.** Physical Specifications of Cisco Branch Routers Series NAM

Physical Specification	Description
<b>Dimensions (H x W x D)</b>	1.55 x 7.10 x 7.2 inches (3.9 x 18.0 x 18.3 centimeters)
<b>Weight</b>	1.5 pounds (0.7 kilograms) maximum
<b>Operating humidity</b>	5 percent to 85 percent (noncondensing)
<b>Operational temperature</b>	41 to 104°F (5 to 40°C)
<b>Nonoperating temperature</b>	-40 to 158°F (-40 to 70°C)
<b>Operational altitude</b>	-197 ft to 6,000 ft (-60 to 1,800 m)
<b>Safety</b>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• CSA 60950-1, Second Edition, Safety of Information Technology Equipment - Safety - Part 1: General Requirements (Canada)</li> <li>• 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</li> <li>• EN 60950-1, Second Edition, Safety of Information Technology Equipment - Safety - Part 1: General Requirements (European Union) incorporating all deviations, as applicable</li> <li>• GB 4943-95, Safety of Information Technology Equipment (Including Electrical Business Equipment) (standard for China, equivalent to IEC 60950)</li> <li>• AS/NZS 60950.1, Information Technology Equipment, Safety part 1: General Requirements (Australia)</li> </ul>

<b>Compliance</b>	<b>Emission:</b> <ul style="list-style-type: none"> <li>• 47 CFR Part 15 Class A</li> <li>• CISPR22 Class A</li> <li>• EN300386 Class A</li> <li>• EN55022 Class A</li> <li>• EN61000-3-2</li> <li>• EN61000-3-3</li> <li>• SD/EMI (India)</li> <li>• KN22 (Korea)</li> <li>• VCCI Class I</li> <li>• AS/NZS CISPR 22 Class A</li> </ul> <b>Immunity:</b> <ul style="list-style-type: none"> <li>• CISPR24</li> <li>• EN300386</li> <li>• EN50082-1</li> <li>• EN55024</li> <li>• SD/EMI (India)</li> <li>• KN22 (Korea)</li> <li>• EN61000-6-1</li> </ul>
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## Information Resources

### Q. Where is additional information about Cisco NAM found?

For more information about Cisco 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](mailto:nam-info@cisco.com).



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