Data Sheet

Cisco **Catalyst 6500 Series**
Network Analysis Module 1 and 2

Second-Generation, High-Performance Network Analysis Modules for Cisco Catalyst® 6500 Series

Cisco Systems, the worldwide leader in networking for the Internet, addresses the need for multi-service network management and traffic monitoring in high-capacity switched Ethernet LANs with a new generation of the Cisco Catalyst® 6500 Series Network Analysis Module (NAM). The NAM, an integrated and powerful traffic monitoring solution for the award-winning, high-performance Cisco Catalyst 6500 Series switches, enables network managers to gain application-level visibility into network traffic with the ultimate goal of improving performance, reducing failures, and maximizing returns on network investment.

The new NAMs are available in two hardware versions, NAM-1 and NAM-2, to meet diverse network analysis needs in a scalable switching environment running up to gigabit speeds. The NAMs come with an embedded, Web-based traffic analyzer, which provides full scale remote monitoring and troubleshooting capabilities that are accessible through a Web browser.

Application-Level Visibility Built into the Network

The Cisco Catalyst 6500 Series NAMs give network managers visibility into all layers of network traffic by providing application-level Remote Monitoring (RMON) functions based on RMON2 and other advanced Management Information Bases (MIBs). The NAMs add to the built-in Remote Monitoring (mini-RMON) features in Cisco Catalyst 6500 Series switches that provide port-level traffic statistics at the Media Access Control (MAC) or data link layer. The NAMs provide intelligence to analyze traffic flows for applications, hosts, conversations, and network-based services such as quality of service (QoS) and voice over IP (VoIP). This intelligence is critical to improving network performance by identifying application or server errors, and reducing network failures through proactive alerts on performance degradation. Network managers can maximize returns on investment by enabling high availability and faster troubleshooting.

Powerful Monitoring in a Scalable Switching Environment

The new NAMs provide high-capacity traffic monitoring to meet the needs of critical traffic analysis at gigabit speeds in the high-performance Cisco Catalyst 6500 Series. The NAMs support traffic monitoring in a scalable switching environment and offer investment protection by interfacing with both the bus and the crossbar switching fabric-based architectures in the Cisco Catalyst 6500 Series.

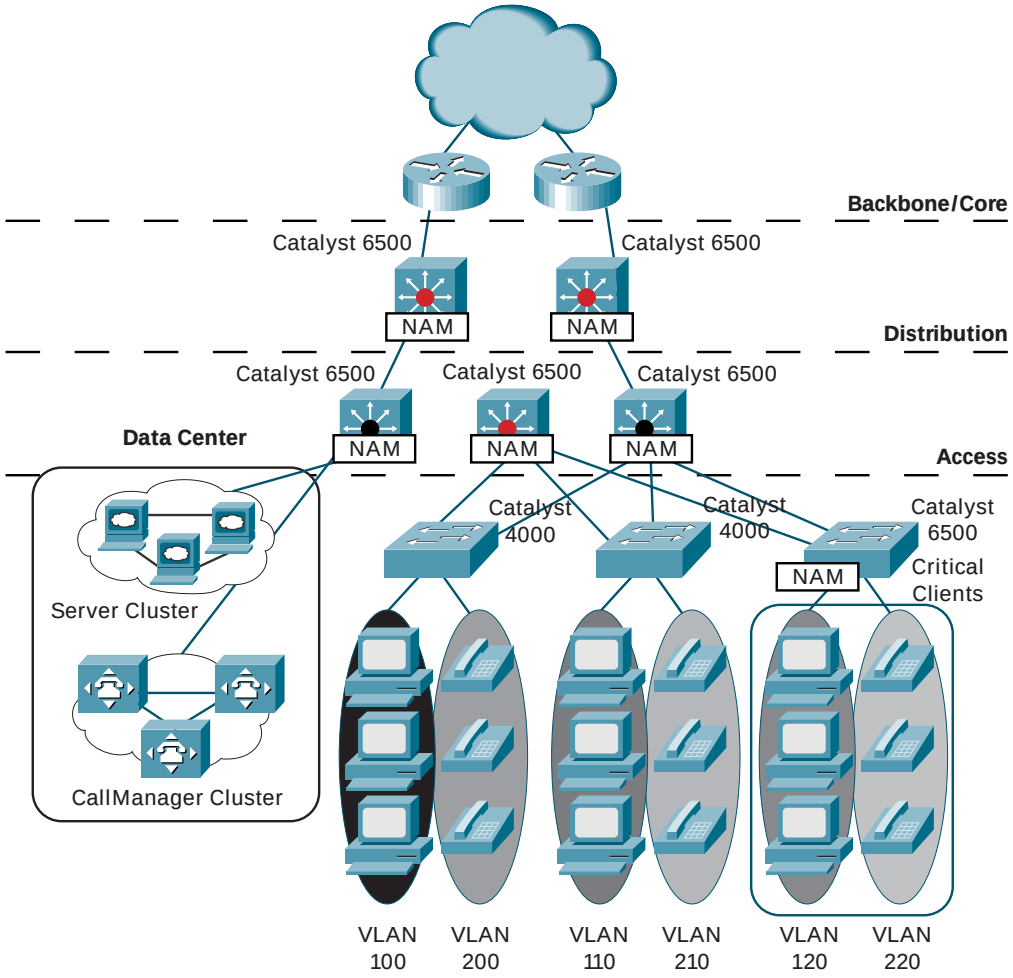
The NAMs collect statistics on both data and VoIP streams flowing through the host switch using the Switch Port Analyzer (SPAN) and NetFlow Data Export features of the Cisco Catalyst 6500 Series. The SPAN features enable the NAMs to collect data from physical ports, virtual LANs

(VLANs), or Cisco EtherChannel® connections and NetFlow Data Export provides the capabilities to monitor the traffic flows that utilize multilayer switching. In addition, the NAMs can collect data from remote switches using the remote SPAN (RSPAN) feature of the Cisco Catalyst 6500 and 4000 Series switches.

Easy to Deploy and Use

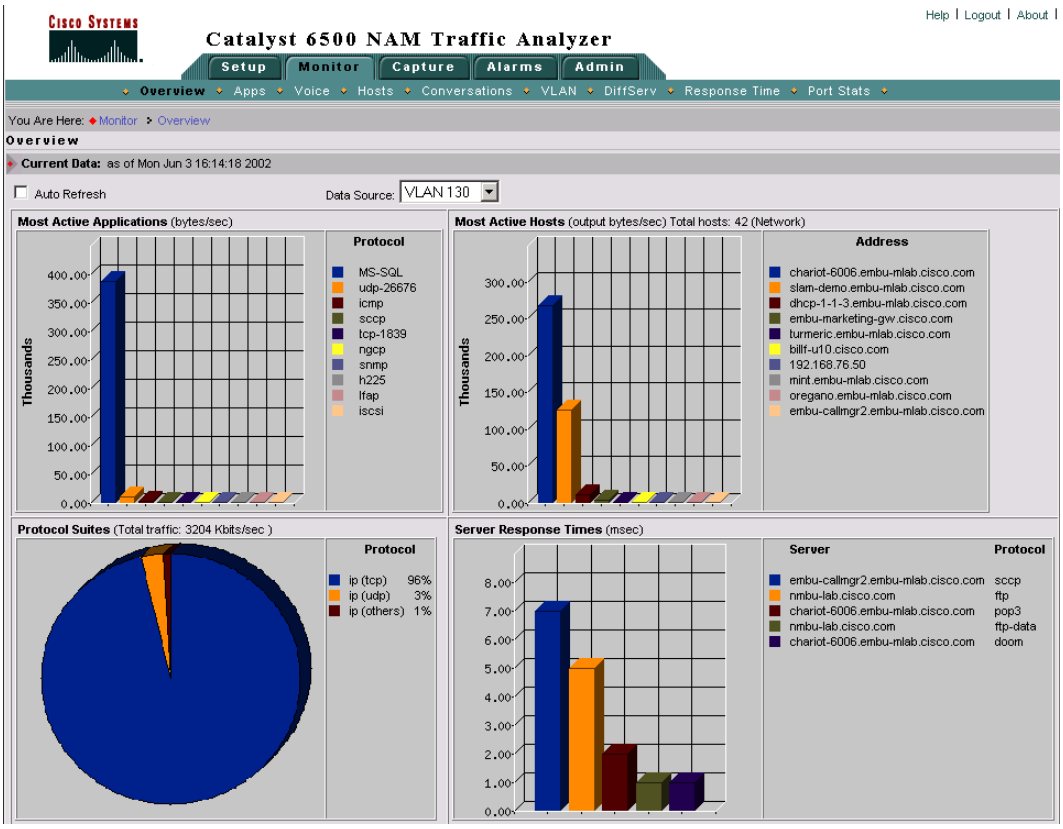
The NAMs can be deployed in the Cisco Catalyst 6500 Series at LAN aggregation points (for example, in the core or distribution layer) where they can see most of the traffic; at service points (for example, in data centers, server farms, or Cisco CallManager clusters in IP telephony) where performance is critical; and at important access points (critical clients, IP phone closets) where quick troubleshooting is required. Figure 1 highlights the deployment of NAMs to enable comprehensive traffic monitoring and analysis for performance monitoring, troubleshooting, and planning.

Figure 1 Deploying NAMs to Build Intelligence into the Network



The NAMs come with the embedded, Web-based Cisco Catalyst 6500 NAM Traffic Analyzer with extensive monitoring and troubleshooting capabilities. Because the NAMs integrate monitoring functions directly into the switch and have full data collection and analysis capabilities on board, they are easy to deploy and managers can conveniently access data from anywhere using a Web browser (Figure 2). For security, users can be given role-based access and the Web browser access can be secured with up to 168-bit encryption.

Figure 2 Web-Based Traffic Monitoring with the Cisco Catalyst 6500 Series NAM



The NAMs also provide the flexibility to use standards-based external applications using the Simple Network Management Protocol (SNMP). NetScout *n*Genius Real-Time Monitor, a component of the CiscoWorks LAN Management Solution (LMS), collects data from NAMs across the network and provides reports on traffic flow.

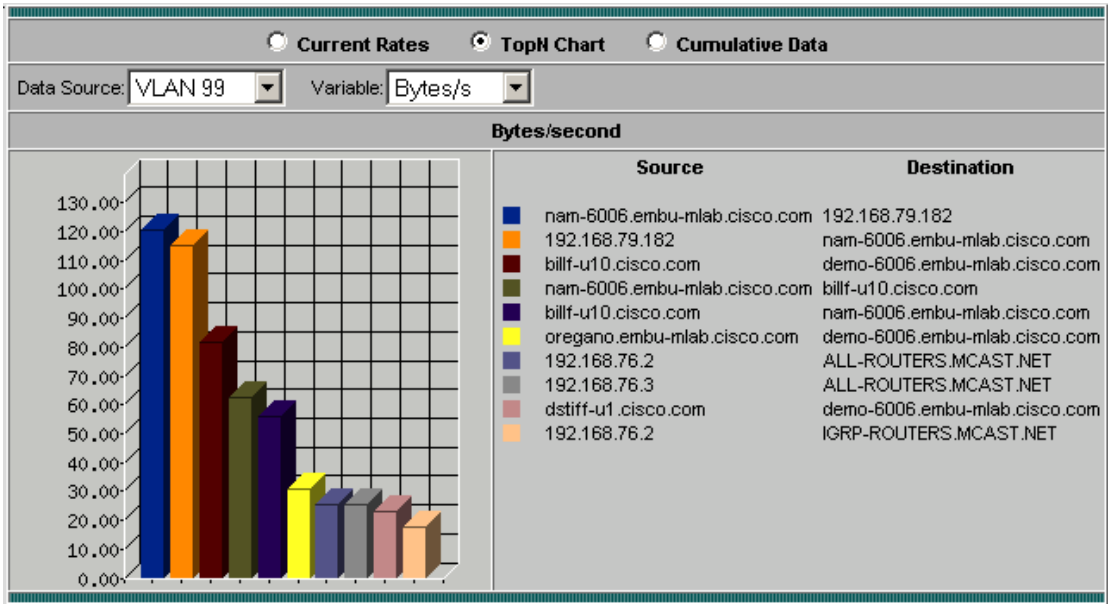
Features and Applications

The data collected by the NAMs can be used for several vital management activities, including application monitoring, performance management, fault isolation, troubleshooting, and capacity planning. The NAMs also play an active role in managing differentiated services such as voice.

Application Monitoring

Using RMON, RMON2, and several extended RMON MIBs, the NAMs detect the applications on the network and provide detailed information about how these applications utilize the bandwidth, which hosts access those applications, and which client/server pairs generate the most traffic. The NAMs support the switch monitoring (SMON) MIB, allowing the analysis of data by VLANs in addition to ports, Cisco EtherChannel, or NetFlow Data Export (Figure 3).

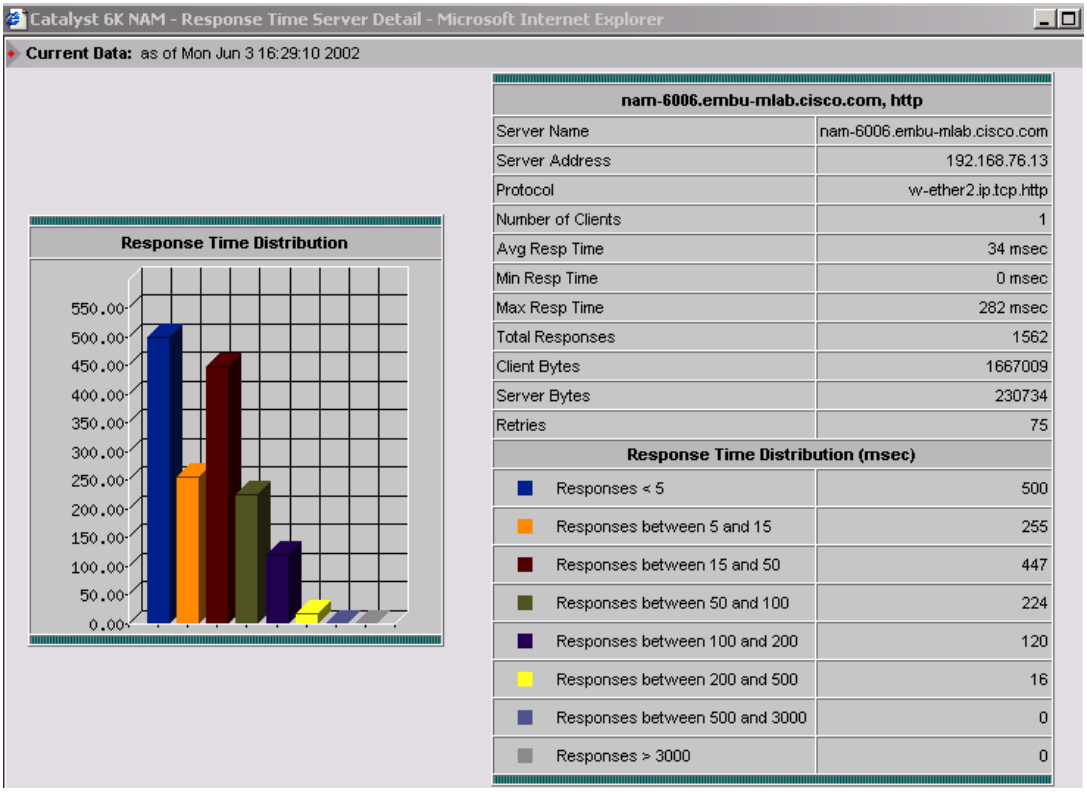
Figure 3 Monitoring Top Talkers on the Network



Performance Management

The NAMs provide valuable information about the delays in server responses to client requests. Using the Application Response Time (ART) MIB, developed by Cisco partner NetScout Systems, the NAMs can identify problems with applications or servers in critical environments such as e-commerce and IP telephony (Figure 4).

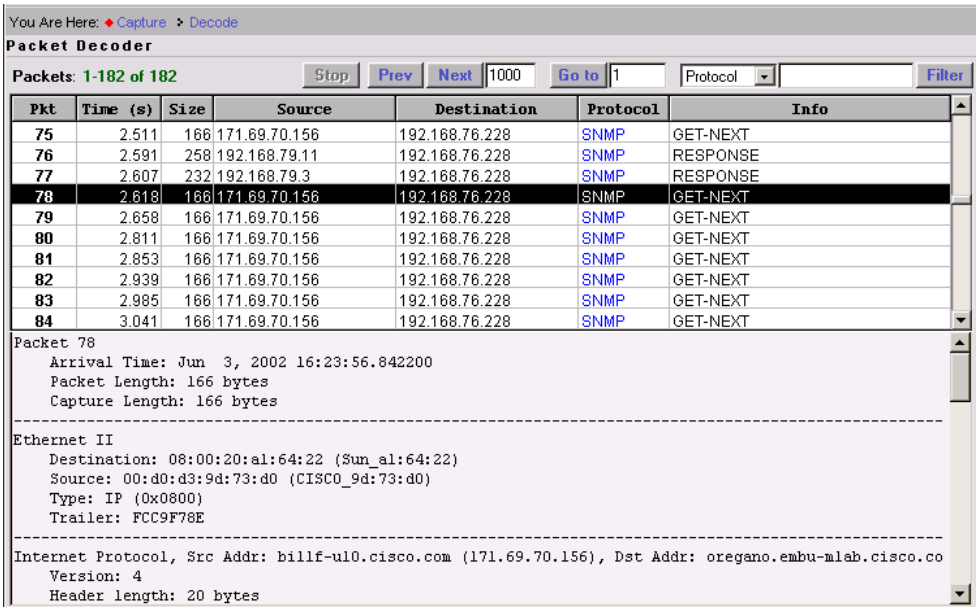
Figure 4 Application Response Time Monitoring



Fault Isolation and Troubleshooting

Using the NAMs, network managers can set thresholds and alarms on various network parameters such as increased utilization, severe application response delays, and voice quality degradation, and be alerted to potential problems. The NAMs provide drill-down views on applications, hosts, voice, quality of service (QoS), and so on, to isolate faults or malfunctions in the network. The Cisco Catalyst 6500 Series NAM Traffic Analyzer can capture and decode packets in real time to aid troubleshooting (Figure 5).

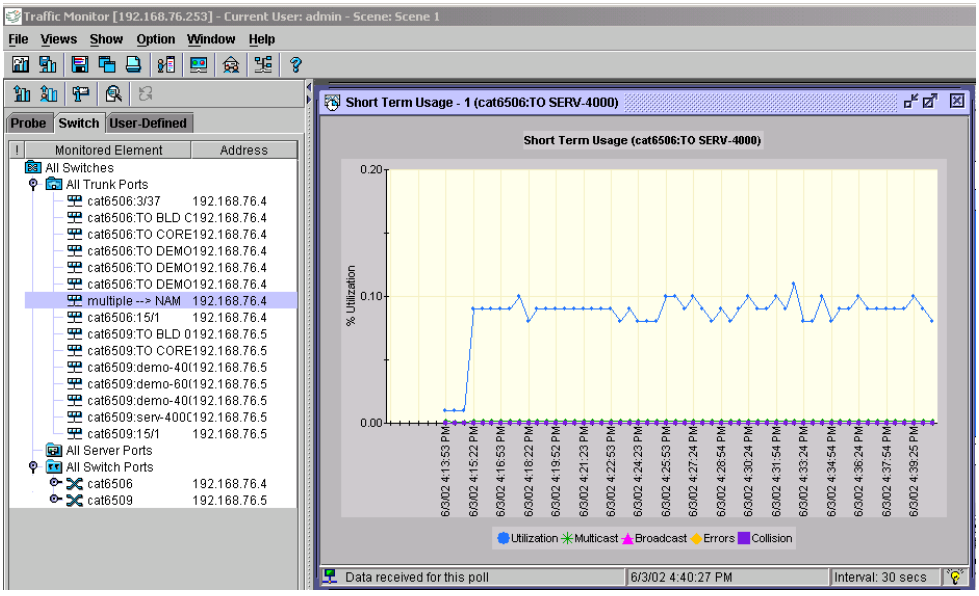
Figure 5 Capturing and Decoding Packets with the Cisco Catalyst 6500 Series NAM



Trend Analysis/Capacity Planning

The data from the NAMs can be collected by NetScout *n*Genius Real-Time Monitor, a component of the CiscoWorks LAN Management Solution (LMS), and other standards-based applications for trending and reporting. Looking at usage trends, network managers can better utilize network resources and plan for future capacity (Figure 6).

Figure 6 Usage Trends Generated by NetScout *n*Genius Real-Time Monitor Using NAM Data



VoIP and Differentiated Services Monitoring

The NAMs can analyze voice traffic flows in real time to collect valuable information, including call setup details and voice quality metrics. Voice VLANs can be spanned to the NAMs for tracking attributes of active calls and individual IP phones. Network managers can be alerted to voice quality degradation and can drill down to isolate potential problems (Figure 7).

The NAMs make the deployment of QoS for voice and other critical services effective by identifying violations of QoS policies. The NAMs support the differentiated services monitoring (DSMON) MIB, which monitors traffic by differentiated services code point (DSCP) allocations defined by QoS policies (Figure 8).

Figure 7 IP Telephony Monitoring with the Cisco Catalyst 6500 Series NAM

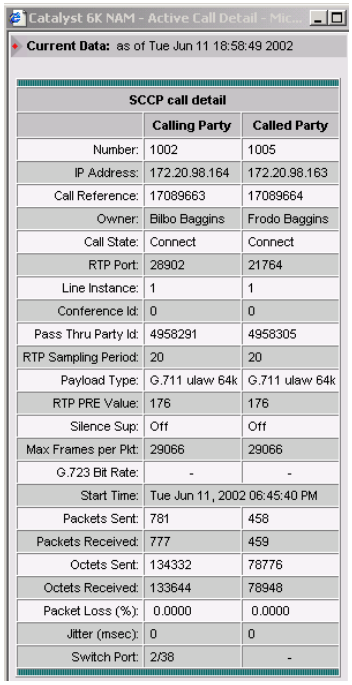
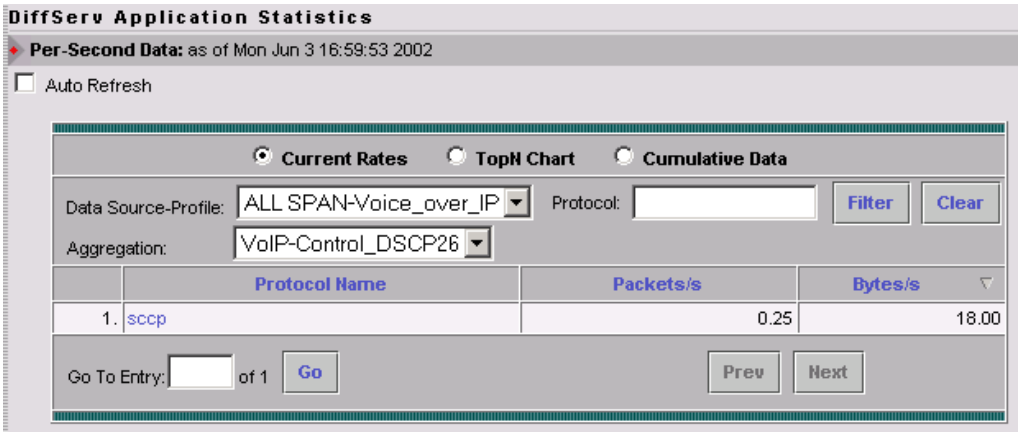


Figure 8 QoS Monitoring Using DSMON



Key Advantages

The NAMs offer a convenient and powerful solution to add intelligence to the network and gain visibility into network traffic for real-time traffic analysis, performance monitoring, troubleshooting, and capacity planning:

- **Integrated solution**—The NAMs occupy a single slot within the Cisco Catalyst 6500 Series chassis and are deployed, managed, and supported as an integral part of the network infrastructure. The NAMs obtain data from the switch backplane and share mini-RMON and other information with the supervisor engine to provide seamless traffic monitoring.
- **Complete LAN monitoring solution**—Complete LAN monitoring solution Web-based traffic analyzer application provides comprehensive monitoring and troubleshooting not only for data traffic but also for netowrk based services like VoIP and QoS. Combining the agent and monitoring application on the same device makes deployment easy.
- **Common management with the switch--**The NAM is managed as a part of the switch using CiscoWorks management tools.
- **Total cost of ownership benefits**— The integrated nature of the NAM solution saves costs in acquiring switch-specific features like mini-RMON, and in maintenance and technical support. The Cisco Catalyst 6500 NAM Traffic Analyzer is embedded in the NAMs at no extra cost.
- **Investment protection for scalable switch performance**—The NAMs support the scalability of the Cisco Catalyst 6500 Series and offer investment protection by interfacing with both the bus and crossbar-based architectures. Network managers can also deploy multiple NAMs in a switch chassis to increase network-monitoring capacity as needed.
- **Standards based**—The NAMs are standards compliant, and can be used with different monitoring applications to meet diverse needs.
- **Secure solution**—The Cisco Catalyst 6500 NAM Traffic Analyzer can be deployed with up to 168-bit encryption, and SNMP can be disabled for fortifying external access to the NAM. The NAMs support Secure Shell (SSH) for secured command line access.

Network Monitoring Solutions

Cisco Systems offers a wide variety of solutions to provide complete visibility into network infrastructure. The Cisco comprehensive solution includes NAMs for Cisco Catalyst 6000, and 6500 series, and CiscoWorks network monitoring applications. *n*Genius Real-Time Monitor, a component of the CiscoWorks LAN Management Solution (LMS), uses data from NAMs across the network to provide broad-based analysis and reports on network traffic.

Licensing

You do not need a separate license to use the NAM software or the embedded Cisco Catalyst 6500 NAM Traffic Analyzer. The use of mini-RMON in Cisco Catalyst 6500 Series switches with NAMs installed does not require the purchase of a separate RMON agent license. The Application Response Time (ART) MIB and the VoIP monitoring features, which required purchase of separate licenses with the earlier version of the NAM (WS-X6380-NAM with SW v2.1), are now included at no extra cost with SW v2.2 for the NAM-1 and NAM-2.

Technical Specifications

NAM-1

- High-performance dual processor architecture
- Interface to both bus- and crossbar- (fabric)-based architectures in Cisco Catalyst 6500 Series
- 512 MB RAM with 96 MB capture buffer

NAM-2

- Extra high-performance dual processor architecture with accelerator card to boost packet processing performance
- Interface to both bus- and crossbar- (fabric)-based architectures in Cisco Catalyst 6500 Series
- 1 GB RAM with 128 MB capture buffer

NAM Software Version 2.2

- Supports NAM-1, NAM-2; does not support earlier NAM hardware platforms
- Cisco Catalyst 6500 NAM Traffic Analyzer requires Microsoft Internet Explorer 5.0 or Netscape 4.7 (minimum)
- ART and VoIP features included
- Supported with Cisco IOS® Software or Cisco Catalyst Operating System on the Supervisor Engine

Supported MIB Groups

The NAMs are standards compliant and support RMON and RMON2 MIBs, as well as several extensions. The major MIB groups supported in the NAMs are:

- MIB-II (RFC 1213) all groups except Exterior Gateway Protocol (EGP) and transmission
- RMON (RFC 2819) all groups
- RMON2 (RFC2021) all groups
- SMON (RFC2613) DataSourceCaps and smonStats
- DSMON (RMON MIB extensions for Differentiated Services)
- ART MIB
- HCRMON

Supported Protocols

The NAMs provide RMON2 statistics on several hundred unique protocols, including those defined in RFC2896, and several Cisco proprietary protocols. The NAMs can automatically detect unknown protocols by TCP/UDP ports and the users have the flexibility to customize the protocol directory.

Examples of Protocols Supported by the NAMs for RMON2 Statistics:

- TCP and UDP over IP including IPv6
- VoIP including SCCP, RTP/RTCP, MGCP, SIP, H.323
- AppleTalk, DECnet, Novell, Microsoft
- Database protocols including Oracle, Sybase
- Bridge and router protocols
- Cisco proprietary protocols

Physical Specifications

- Occupies any slot in the Cisco Catalyst 6500 or 6000 series chassis
- Dimensions (H x W x D): 1.2 x 14.4 x 16 in. (3.0 x 35.6 x 40.6 cm)

Operating Environment

- Operating temperature: 32 F (0 C) to 104 F (40 C)
- Non-operating and storage temperature: -40 F (-40 C) to 158 F (70 C)
- Operating relative humidity: 10% to 90% (non-condensing)
- Non-operating relative humidity: 5% to 95% (non-condensing)
- Operating and non-operating altitude: Sea level to 10,000 ft. (3050 m)

Agency Approvals

- Regulatory: CE Marking (89/366/EEC and 73/23/EEC)
- Safety: UL 1950, CAN/CSA-C22.2 No. 950, EN 60950, IEC 60950
- Electromagnetic Emissions: FCC Part 15 (CFR 47) Class A, ICES-003 Class A, EN55022 Class A, CISPR22 Class A, AS/NZS 3548 Class A, VCCI Class A, EN55024, EN50082-1

Ordering Information

Cisco Part Number	Description
WS-SVC-NAM-1	Catalyst 6500 Series Network Analysis Module-1
WS-SVC-NAM-2	Catalyst 6500 Series Network Analysis Module-2
SC-SVC-NAM-2.2	Network Analysis Module Software v 2.2 for NAM-1, NAM-2 (includes ART, VoIP)

More Information

http://www.cisco.com/warp/public/cc/pd/ifaa/6000nam/

Corporate Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

European Headquarters
Cisco Systems Europe
11 Rue Camille Desmoulins
92782 Issy-les-Moulineaux
Cedex 9
France
www-europe.cisco.com
Tel: 33 1 58 04 60 00
Fax: 33 1 58 04 61 00

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
Fax: 408 527-0883

Asia Pacific Headquarters
Cisco Systems, Inc.
Capital Tower
168 Robinson Road
#22-01 to #29-01
Singapore 068912
www.cisco.com
Tel: +65 317 7777
Fax: +65 317 7799

Cisco Systems has more than 200 offices in the following countries and regions. Addresses, phone numbers, and fax numbers are listed on the

Cisco Web site at www.cisco.com/go/offices

Argentina • Australia • Austria • Belgium • Brazil • Bulgaria • Canada • Chile • China PRC • Colombia • Costa Rica • Croatia Czech Republic • Denmark • Dubai, UAE • Finland • France • Germany • Greece • Hong Kong SAR • Hungary • India • Indonesia • Ireland Israel • Italy • Japan • Korea • Luxembourg • Malaysia • Mexico • The Netherlands • New Zealand • Norway • Peru • Philippines • Poland Portugal • Puerto Rico • Romania • Russia • Saudi Arabia • Scotland • Singapore • Slovakia • Slovenia • South Africa • Spain • Sweden Switzerland • Taiwan • Thailand • Turkey • Ukraine • United Kingdom • United States • Venezuela • Vietnam • Zimbabwe

06/02 BW8331