# Cisco Prime Network Analysis Module (NAM) Software 5.1 for Nexus 1010

## General Overview

**Q. What is the Cisco Nexus® 1000V Network Analysis Module (NAM) Virtual Service Blade (VSB) and what does it do?**

**A.** The Cisco Nexus 1000V NAM VSB is integrated software that resides on the Cisco Nexus 1010 Virtual Services Appliance. It extends operational visibility into Cisco Nexus 1000V Switch deployments and provides the combined network and application performance visibility essential to address service delivery challenges in next-generation data centers. It allows network administrators to effectively use embedded management features, such as Encapsulated Remote Switched Port Analyzer (ERSPAN) and NetFlow, on the Cisco Nexus 1000V Switch, to gather operational data, and combines the collected data with rich analytics to produce actionable information remotely accessible from a web-based management console. The Cisco® NAM includes an embedded, web-based Traffic Analyzer GUI that provides quick access to the configuration menus, traffic statistics, and application performance views.

**Q. Why is operational visibility into the Cisco Nexus 1000V Switch essential for network administrators?**

**A.** As mission-critical workloads migrate to virtual servers, visibility into the virtual switching infrastructure (Cisco Nexus 1000V) becomes critical to manage end-to-end service delivery. The virtual switching layer extends the network to the virtual servers. Lack of insight into this layer affects the ability of network administrators to manage application services. In addition, the fluidity of the virtual infrastructure poses a new set of management challenges. In this dynamic environment, network administrators are responsible not only for troubleshooting application performance issues but also for making sure that the network is ready to support workload-driven dynamic resource allocations or virtual server migrations.

**Q. What is the Cisco Nexus 1000V NAM Virtual Service Blade value proposition for network administrators?**

**A.** The Cisco NAM VSB allows network administrators to effectively manage virtual machine (VM) networks to:

- Analyze network usage behavior by application, host/VM, and conversation to identify bottlenecks that may affect performance and availability
- Troubleshoot performance issues with extended visibility into VM-to-VM traffic, virtual interface statistics, and transaction response times
- Assess impact on network behavior due to changes such as VM migration, new application deployment, and port profile update
- Improve the efficiency of your virtual infrastructure and distributed application components with comprehensive traffic analysis

As a distinctive advantage, Cisco NAM allows you to monitor the network and virtual machines uninterrupted by vMotion operations.

**Q. What are the key features and benefits of the Cisco Nexus 1000V NAM Virtual Service Blade?**

**A.** The features supported with Cisco Nexus 1000V NAM VSB are provided in Table 1. Note that not all NAM software features are supported by Cisco Nexus 1000V NAM VSB.

**Table 1.** Key Features and Benefits of the Cisco NAM

| Feature | Benefit |
|---|---|
| **Integrated solution** | Integrated with Cisco Nexus 1010 Virtual Services Appliance, Cisco NAM VSB provides greater investment protection, lower total cost of ownership, and reduced footprint to save premium rack space. |
| **Traffic analysis** | Real-time traffic analysis views and targeted long-term reports to help enable network administrators to analyze and optimize the performance of the virtual and physical network. Monitoring applications, hosts, virtual machines, and conversations can help to spot bottlenecks before the virtual network suffers blows to performance and availability. |
| **Application performance intelligence** | Analyzes the TCP-based messages across the servers (virtual or physical) to provide comprehensive transaction- and session-based statistics to help troubleshoot application response time issues. Network administrators can analyze performance metrics, such as network delay, round-trip time, retransmission time, and so on, to identify the source of degradation. |
| **Quality of service (QoS) analysis** | Validate and fine-tune QoS planning assumptions when creating or updating port profiles or use it to detect whether an application is misclassified or contending for limited virtual network resources with non-business-critical traffic. |
| **Interface monitoring** | Visibility into traffic statistics for both virtual and physical interfaces allows administrators to quickly troubleshoot application performance issues. They can monitor statistics such as percent utilization, throughput, packet discards, and errors for each interface, along with the ability to navigate to gather more details including top-N applications, hosts, and conversations. |
| **Secure solution** | Offers TACACS+, Secure Sockets Layer (SSL), and Secure Shell (SSH) Protocol-based security. |
| **Standards-based northbound interface** | Third-party applications gather application and network performance information from Cisco NAMs deployed across the network for consolidated networkwide reporting. Such applications complement the granular performance visibility offered by Cisco NAMs to help enable you to monitor how applications are being delivered enterprisewide, yet isolate and resolve delivery problems proactively and promptly at their source. |
| **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 multigigabit appliances, and as virtual service blades residing directly on Cisco Wide Area Application Services (WAAS) devices or on the Nexus 1010 Virtual Services Appliance. The complement of physical and virtual blades and of appliances allows NAM instrumentation to be broadly deployed in the network for comprehensive performance visibility across the Cisco Borderless Network. |

**Q. What are the business benefits of deploying Cisco Nexus 1000V NAM Virtual Service Blade?**

**A.** Table 2 provides an overview of the business benefits that the NAM offers.

**Table 2.** Business Benefits of Deploying Cisco NAM

| Benefit | Description |
|---|---|
| **Improve service levels** | Help ensure consistent service delivery with applications deployed in a virtual computing environment. |
| **Improve operational efficiency** | Extended visibility into virtual switching infrastructure allows network administers to manage the virtual switch like any physical switch. |
| **Effective use of virtual network resources** | Real-time traffic analysis views and targeted long-term reports facilitate analysis of network usage patterns by network administrators and allows them to:<br>• Improve efficiency of virtual networks to support dynamic resource allocations and virtual machine migrations<br>• Plan transition from physical to virtual server deployment<br>• Align usage of virtual network resources with business needs |
| **Network readiness for virtualization** | |

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

**A.** As previewed in the first answer, the Cisco NAM VSB can monitor the Cisco Nexus 1000V using ERSPAN and NetFlow data sources. ERSPAN can be configured on the Cisco Nexus 1000V to enable the Cisco NAM to obtain visibility into specific ports or VLANs. The data made available by ERSPAN permits the NAM to provide core traffic usage metrics (on applications, hosts, and conversations), IAP analytics, and QoS and VLAN monitoring statistics. NetFlow Data Export (NDE) can be configured on select virtual and physical interfaces of the Cisco Nexus 1000V. The data made available by NetFlow permits the NAM to provide core traffic analytics and QoS monitoring statistics.

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

**A.** The Cisco NAM includes embedded Traffic Analyzer software, which analyzes and stores the collected data using standards-based MIBs and extensions (remote monitoring [RMON], DiffServ monitoring [DSMON], switch monitoring [SMON], IAP monitoring). The Cisco NAM also hosts an embedded web server that presents the configuration menus and traffic reports to clients using a supported web browser.

**Q. Where is the Cisco Nexus 1000V NAM VSB deployed in the network?**

**A.** The Cisco NAM VSB is deployed as an integrated service with Cisco Nexus 1010 Virtual Services Appliance.

**Q. Can NAM be used for visibility into the Nexus 1000V Switch where Virtual Supervisor Module is deployed as a virtual machine (software-only installation)?**

**A.** Yes, NAM (select form factors) with software release 4.2 or later can be used for visibility into software-only installations of Nexus 1000V. For example, the Catalyst 6500 Series NAM can be used with the Catalyst 6500 Series Switch deployed in virtual data center access or NAM appliances can generally be used for deployments that require higher performance and scalability.

**Q. Can the Cisco Nexus 1000V NAM VSB monitor VMs during migration with vMotion?**

**A.** VMware vMotion is a technology that helps enable 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 as the virtual switching platform along with a Cisco NAM VSB, the VMs can be monitored uninterrupted by vMotion operations. Thus, application traffic destined or originating on a specific VM along with corresponding traffic statistics can be continuously monitored even when the VM is being migrated from one physical server to another. This feature is critical when monitoring the response time of applications running on the VM being migrated or monitoring live conversations in the same scenario. This important insight allows IT to make sure that application response times are not being affected due to VM migrations. It also lets IT assess any impacts on network behavior due to such operations.

**Q. When would I purchase a Cisco Catalyst 6500 NAM versus a Cisco Nexus 1000V NAM VSB?**

**A.** The Cisco Catalyst 6500 NAM is a hardware module integrated in the Cisco Catalyst 6500 that provides visibility into both physical and virtual networks. It comes with a feature set and level of performance commensurate with providing wide-ranging monitoring and troubleshooting capabilities 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 that is specifically targeted for monitoring and troubleshooting the Cisco Nexus 1000V environment. The Cisco NAM VSB is a perfect fit for customers who are deploying the Cisco Nexus 1010 appliance, offering both ease of deployment and investment value. Those customers who have Cisco Catalyst 6500s, 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 the Cisco Catalyst 6500 NAM.

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

**A.** The Cisco NAM appliances extend the reach of NAM into places and platforms not currently served by service modules or virtual service blades. The appliances offer high performance and maximum deployment flexibility. In addition, the appliances offer wide-ranging monitoring and troubleshooting capabilities across both physical and virtual networks. 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 that is specifically targeted for monitoring and troubleshooting the Cisco Nexus 1000V environment. The Cisco NAM VSB is a perfect fit for customers who are deploying the Cisco Nexus 1010 appliance, 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 appliance.

## Technical Overview

**Q. How does the Cisco NAM work?**

**A.** In general, Cisco NAM collects packets or flows (NetFlow Data Export) being sent to it from the switch or router. The NAM parses the packets and extracts data to populate standards-based management information bases (MIBs) included in the NAM such as RMON/RMON2 and RMON extensions. The MIBs provide valuable traffic information on voice, video, and data traffic, VLANs, 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 to build additional value for enterprise wide performance assurance and reporting.

Cisco Nexus 1000V NAM VSB uses data sources supported by Nexus 1000V as listed in Table 3.

**Table 3.** Cisco Nexus 1000V NAM VSB Data Sources

| Data Source | Description |
|---|---|
| **ERSPAN** | Using ERSPAN capabilities of Nexus 1000V Series Switches, traffic from ports or VLAN can be sent to the NAM using generic routing encapsulation (GRE) tunnels. |
| **NDE** | NDE records offer an aggregate view of the network traffic. When enabled on the switch, the NetFlow data source becomes available on the Cisco NAM. |

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

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

**Q. What versions of NetFlow does the Cisco Nexus 1000V NAM VSB support?**

**A.** The NAM supports versions 1, 5, 6, 7, 8, and 9.

**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 Cisco Nexus 1000V NAM VSBs be installed on Nexus 1010 Virtual Services Appliance?**

**A.** Only a single instance of NAM VSB can be installed on Nexus 1010 Virtual Services Appliance.

**Q. Can two Cisco Nexus 1000V NAM VSBs be configured in redundant mode so that when one fails the other one takes over automatically, or do NAMs function independently?**

**A.** The NAMs function independently even in scenarios where Cisco Nexus 1000V NAM VSB is deployed on each Nexus 1010 appliance configured in High Availability mode.

**Q. What protocols does the Cisco NAM monitor?**

**A.** The Cisco NAM monitors several hundred unique protocols, including those defined in RFC 2896 and several Cisco proprietary protocols. In addition, the NAM can automatically detect unknown protocols and offers users the flexibility to customize the protocol directory to meet their specific requirements. Examples of protocols supported by the Cisco NAM for monitoring follow:

- TCP and User Datagram Protocol (UDP) over IP including IPv6
- HTTP and HTTPS
- 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)
- SigTran and Mobile IP protocols including General Radio Packet Service (GPRS)s Tunneling Protocol (GTP)

- 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 winmix
- Bridge and router protocols
- Cisco proprietary protocols
- Unknown protocols by TCP/UDP ports, Remote Procedure Call (RPC) program numbers, and so on

### Software Features

**Q. Does Cisco Nexus 1000V NAM VSB support the packet capture and decode feature?**

**A.** Current version of NAM VSB does not support the packet capture and decode capability.

**Q. Does the Cisco Nexus 1000V NAM VSB 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. Historical reports can be scheduled for export or exported on demand. Reports can be sent by email or through FTP, and export formats can include comma-separated value (CSV), XML, PDF, and HTML.

**Q. Does Cisco Nexus 1000V NAM VSB support voice monitoring?**

**A.** No. Cisco NAM VSB does not support the voice monitoring feature.

### 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 multiple mechanisms, such as NetFlow Version 9, SNMP, and comma-separated value (CSV)/HTTP to enable third-party reporting applications to collect data for networkwide reporting, trending, baselining, and capacity planning. The API allows you to use computed NAM data to feed in-house or third-party reporting applications that you already own, building up additional value and building out existing investments. NAM 5.0 introduces an XML/REST-based API for NAM configuration and NetFlow Version 9 as a flexible and standard mechanism for data export.

**Q. How can a third party apply for approval to use the Cisco NAM 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 http://www.cisco.com/go/cdn, under Find a Partner, Network and Services Management, and Network Management Services Modules.

### Ordering

**Q. When is Nexus 1000V NAM VSB 4.2.1N available?**

**A.** Cisco Nexus 1000V NAM VSB software 4.2.1N is expected to be available starting in May February 2011.

**Q. What are the part numbers for the Cisco Nexus 1000V NAM VSB?**

**A.** Table 4 lists the part numbers for the Nexus 1000V NAM VSB.

**Table 4.** Cisco Nexus 1000V NAM VSB Part Numbers

| Cisco Part Number | Description |
|---|---|
| **N1K-C1010-NAM-4.2** | Cisco NAM Software 4.2.1N for Cisco Nexus 1000V NAM Virtual Service Blade |
| **N1K-C1010-NAM-4.2=** | Cisco NAM Virtual Service Blade Software 4.2.1N for C1010 Spare |
| **L-N1KC1010-NAM4.2=** | Cisco NAM Virtual Service Blade Software 4.2.1N for C1010 (eDelivery) |

**Q. What is the licensing model of Nexus 1000V NAM VSB?**

**A.** Nexus 1000V NAM VSB licensing is node-locked implemented based on Cisco Software Licensing. Only one instance of NAM VSB can be installed on a Cisco Nexus 1010 appliance. The NAM Virtual Service Blade image will be preloaded (not installed) on the Cisco Nexus 1010 appliance with a 60-day evaluation license.

**Q. What is the difference between Nexus 1000V NAM VSB versions 4.2 and 4.2.1N?**

**A.** The NAM VSB 4.2.1N helps ensure compatibility with Nexus 1000V version 1.4. In addition, it delivers significant improvement in performance and scalability.

## Additional Information

**Q. Does the Cisco NAM complement Cisco security solutions?**

**A.** Yes. The Cisco NAM is also complementary to Cisco's traditional security devices. Once an intrusion is seen, the NAM can analyze the details of what is going on. The NAM also helps to deploy inline security devices by constantly measuring VLAN throughput so that the inline device is sized correctly. And, as the network grows and traffic increases, the NAM can track resource usage for future capacity planning. Also, because the NAM can analyze traffic on either side of the inline device, it provides a useful way to gauge the effectiveness of these tools and to troubleshoot potential connectivity problems as they arise.

**Q. What Cisco NAM training options are available?**

**A.** The following Cisco NAM training options are available:

- NAM Tutorial: The tutorial is a scripted, detailed PowerPoint presentation that provides granular information on what the NAM does and how it does it, along with use cases and even a brief troubleshooting guide. It includes a high-level table of contents, so that specific areas of interest can be reviewed when desired. It can be found at http://wwwin.cisco.com/nmtg/fieldportal/products/nam/index.shtml.
- Instructor-Led Training: Available on request.

**Q. Where is additional information about the Cisco NAM found?**

**A.** For more information about the Nexus 1000V NAM VSB, visit http://www.cisco.com/go/1000nam (external) or contact 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

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at **www.cisco.com/go/offices.**



Printed in USA C67-642456-01 07/11