

## Cisco Nexus 1000V Network Analysis Module Virtual Service Blade 4.2.1N

As mission-critical workloads migrate to virtual servers, visibility into the virtual switching infrastructure 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, in terms of workload-driven dynamic resource allocation or virtual server migrations across hosts, poses a new set of management challenges. In this dynamic environment, network administrators are not only responsible for troubleshooting application performance issues but also for making sure that the network is ready to support resource scaling in real time. This demands deeper network visibility and analytics to present meaningful and consistent performance information for network administrators.

### Product Overview

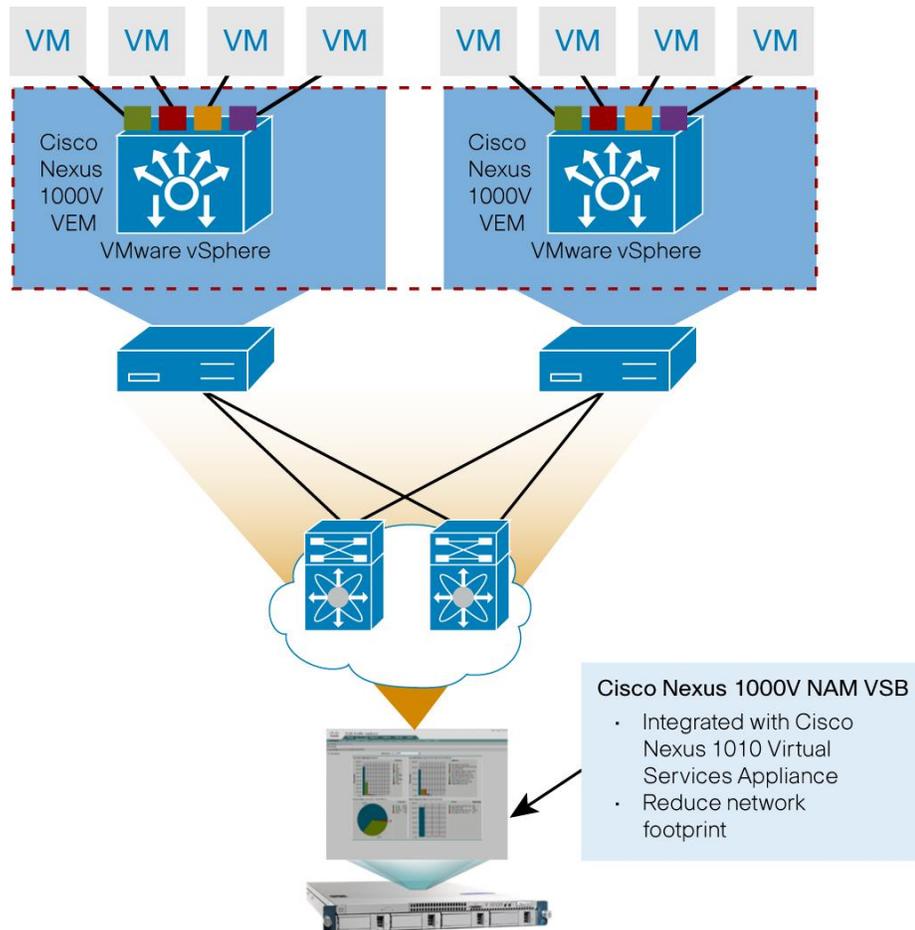
Cisco Nexus 1000V Network Analysis Module (NAM) Virtual Service Blade (VSB) allows network administrators to extend operational visibility into Cisco Nexus 1000V Switch deployments (Figure 1). The Cisco Nexus 1000V Switch is a software switch on a server that delivers Cisco Virtual Network Link (VN-Link) services to virtual machines (VMs) hosted on that server. This distributed switch has two major components: the Virtual Ethernet Module (VEM) and the Virtual Supervisor Module (VSM), which manages the VEMs. A VSM can itself be deployed as a virtual machine; as an alternate deployment scenario, the [Cisco Nexus 1010 Virtual Services Appliance](#) can host four Virtual Supervisor Modules.

Integrated with the Cisco Nexus 1010 appliance, the Cisco NAM VSB offers combined network and application performance visibility essential to address service delivery challenges in next-generation data centers. The Cisco NAM VSB allows you to effectively use embedded management features, such as Encapsulated Remote Switched Port Analyzer (ERSPAN) and NetFlow, on the Cisco Nexus 1000V Switch 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.

**Figure 1.** Cisco Nexus 1000V NAM Virtual Service Blade Deployment



## Features and Benefits

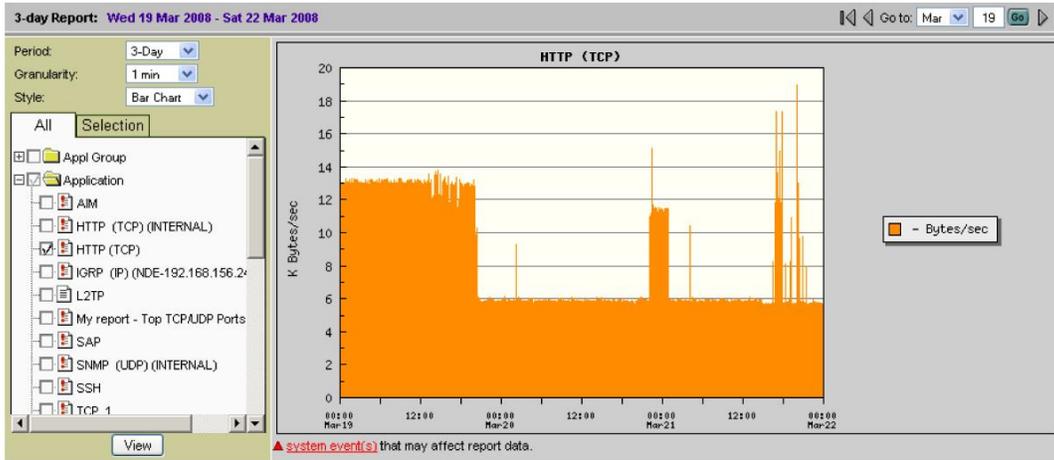
### Traffic Analysis

As an integrated solution, Cisco Nexus 1000V NAM Virtual Service Blade offers 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. Cisco NAM can analyze NetFlow data exports or ERSPAN packet streams from the Cisco Nexus 1000V Switch to gather information on applications, hosts, virtual machines, and conversations.

Application monitoring identifies every application that has consumed bandwidth, reports how much bandwidth has been consumed, and detects which hosts or virtual machines are using which applications. Host and conversation-pair monitoring provides bandwidth consumption per host or virtual machine and shows which hosts/virtual machines are talking to each other. Monitoring applications, hosts, virtual machines, and conversations can help to spot bottlenecks before the virtual network suffers blows to performance and availability. It can also help improve the consistency and quality of both individual and overall network services since these metrics reveal usage patterns for users as well as for router and switch, interface, server (physical and virtual), and application resources.

Besides delivering a real-time snapshot of bandwidth usage and consumption, Cisco NAM can also deliver a longer-term view (Figure 2) of how the bandwidth was used so the network administrator can analyze trends. The information can be used to improve the efficiency of the network to support events such as dynamic resource allocation and virtual machine migrations.

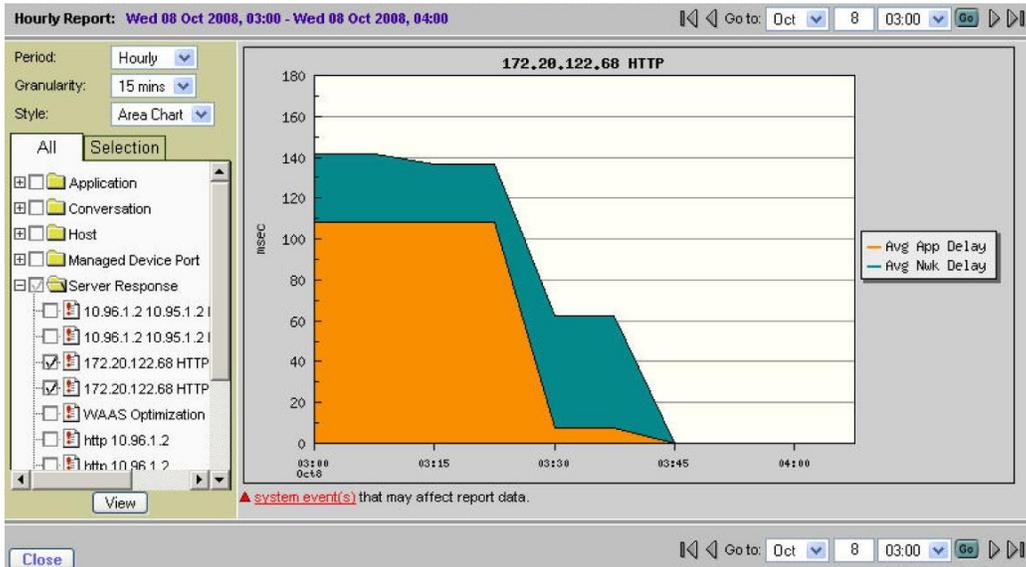
**Figure 2.** Granular Analysis of HTTP Traffic on the Network



**Intelligent Application Performance Analytics**

Cisco Nexus 1000V NAM Virtual Service Blade 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. It allows network administrators to analyze performance metrics, such as network delay, round-trip time, retransmission time, and so on, to identify the cause of degradation. For example, server resource issues affecting application performance can be identified by network metrics such as application delay and server response time. Figure 3 provides an example of the application response time report for an HTTP application. The report shows reduction in the application delay after the administrator restarted a hung process on the application server virtual machine.

**Figure 3.** Troubleshooting Application Response Time

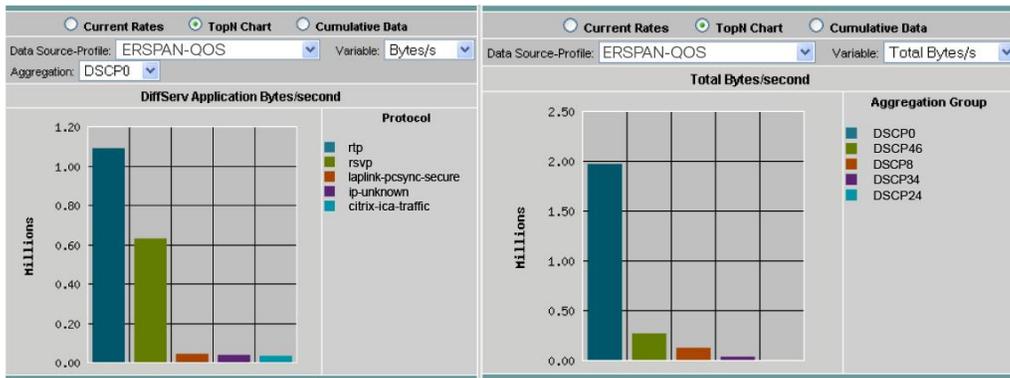


The application performance data can also be analyzed over time to identify trends. The capability allows administrators to assess the impact on application performance due to changes such as dynamic virtual machine creation, virtual machine migration, port profile updates, and so on.

### Quality of Service Analysis

Cisco Nexus 1000V NAM Virtual Service Blade supports the Differentiated Services (DiffServ) Monitoring (DSMON) MIB, which monitors traffic by differentiated services code point (DSCP) allocations defined by the quality of service (QoS) policies. Using the Cisco NAM DiffServ monitoring capabilities, applications, hosts, and conversations participating in each grouping of DiffServ classes can be identified (Figure 4). This information can be used to validate and fine-tune QoS planning assumptions when creating or updating port profiles. It can also be used to detect whether an application is misclassified or contending for limited virtual network resources with non-business-critical traffic.

Figure 4. Analyzing QoS Using DSMON



### Interface Monitoring

The Cisco Nexus 1000V NAM Virtual Service Blade offers visibility into traffic statistics for both virtual and physical interfaces in order to quickly troubleshoot application performance issues. Network administrators can configure any of the Cisco VSMs coexisting on the Cisco Nexus 1010 Virtual Services Appliance as managed device to 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. In addition, Cisco NAM can be configured to provide notification of any of these values (Figure 5) should they exceed the thresholds to enable proactive management.

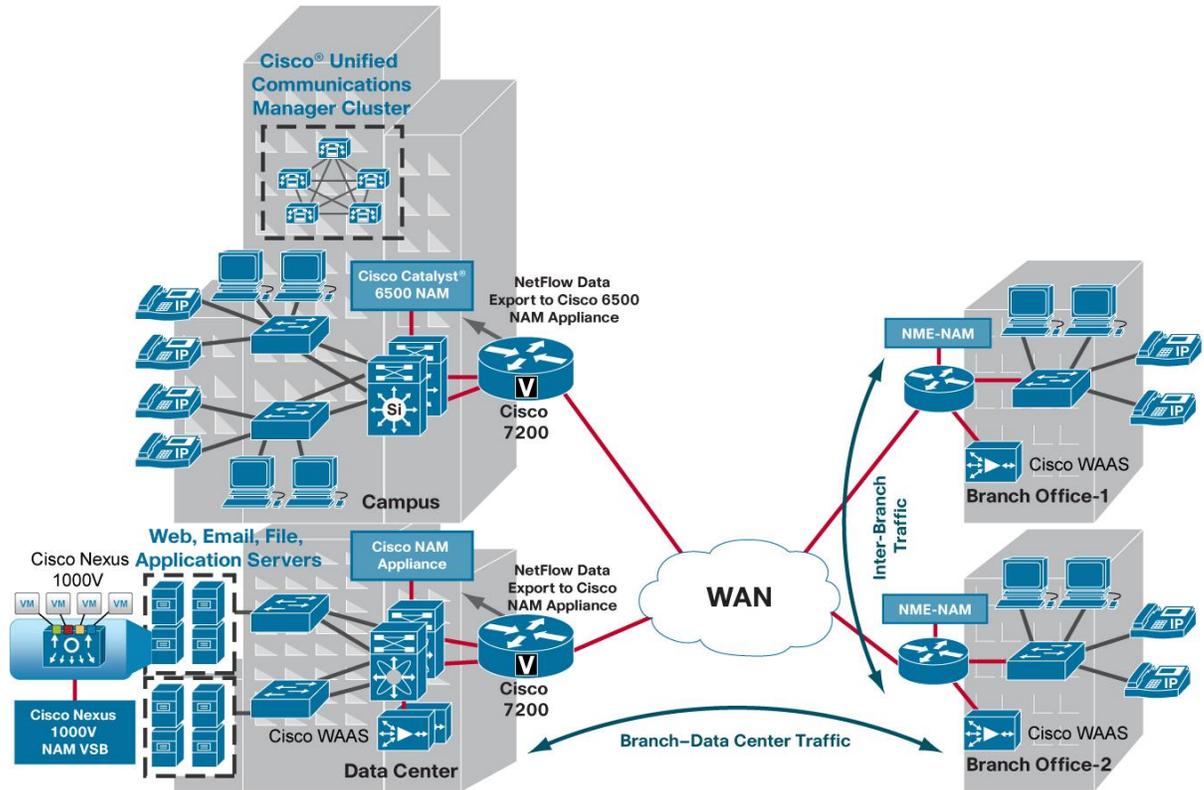
Figure 5. Monitoring Interfaces with Cisco Nexus 1000V NAM Virtual Service Blade

#	Interface	In % Utilization	Out % Utilization	In Packets/s	Out Packets/s	In Bytes/s	Out Bytes/s	In Non-Unicast/s	Out Non-Unicast/s	In Discards/s	Out Discards/s	In Errors/s	Out Errors/s
1.	Vethernet7	0.00	0.00	577.52	742.10	1,037,536.07	52,218.40	0.08	0.00	0.00	0.00	0.00	0.00
2.	Vethernet9	0.00	0.00	459.90	569.78	1,028,962.72	40,842.37	0.00	0.00	0.00	0.00	0.00	0.00
3.	Vethernet6	0.00	0.00	421.38	549.05	1,028,134.47	39,460.63	0.00	0.00	0.00	0.00	0.00	0.00
4.	Vethernet4	0.00	0.00	1,319.40	0.07	190,384.97	814.60	0.00	7.67	0.00	0.00	0.00	0.00
5.	Vethernet2	0.00	0.00	1,031.35	0.00	149,072.38	802.53	0.00	7.70	0.00	0.00	0.00	0.00
6.	Vethernet3	0.00	0.00	969.98	0.02	138,568.47	802.97	0.00	7.67	0.00	0.00	0.00	0.00
7.	Ethernet3/2	0.44	9.86	755.52	1,911.77	54,842.05	1,232,142.20	7.67	0.10	0.00	0.00	0.00	0.00
8.	Ethernet6/2	0.03	0.94	583.68	1,503.42	43,611.18	1,181,027.60	7.70	0.02	0.00	0.00	0.00	0.00
9.	Ethernet5/2	0.03	0.94	558.53	1,401.80	41,524.35	1,168,948.45	7.67	0.02	0.00	0.00	0.00	0.00
10.	Ethernet4/2	0.00	0.00	10.62	10.58	2,300.52	2,558.85	7.67	0.02	0.00	0.00	0.00	0.00
11.	mgmt0	0.00	0.00	14.42	8.75	2,214.22	1,669.70	0.00	0.00	0.00	0.00	0.00	0.00
12.	Vethernet1	0.00	0.00	0.00	0.03	0.00	807.67	0.00	7.70	0.00	0.00	0.00	0.00

## Bring It All Together

As flexible advanced Cisco instrumentation, the Cisco NAMs can be deployed at places in the network necessary for end-to-end network and application performance visibility. In an example scenario illustrated in Figure 6, Cisco Nexus 1000V NAM Virtual Service Blade is deployed with the Cisco Nexus 1010 appliance in the data center for operational visibility into Cisco Nexus 1000V deployments. This integrated solution allows you to monitor virtual network behavior and analyze communication across virtual machines to gain performance visibility into applications deployed in virtual computing environment.

**Figure 6.** Cisco NAM Offers Deployment Flexibility to Enable Performance Visibility across Cisco Borderless Network



The intelligence from Cisco Nexus 1000V NAM Virtual Service Blade can optionally be combined with other NAM form factors such as Cisco Catalyst® 6500 Series NAM, Cisco NAM appliance, or Cisco Branch Routers Series NAM deployed in the data center, campus, or remote sites to provide enterprisewide visibility.

Cisco NAM can export computed performance information to third-party and homegrown applications to meet end-to-end performance reporting needs. 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.

## Licensing

Cisco Nexus 1000V NAM Virtual Service Blade licensing is based on Cisco Software Licensing. Additional details can be obtained at <http://www.cisco.com/go/clm>. The Cisco Nexus 1000V NAM Virtual Service Blade will be available preloaded on the Cisco Nexus 1010 appliance with a 60-day evaluation license. Customers will also be able to download the Cisco Nexus 1000V NAM Virtual Service Blade at [Cisco Software Center](#).

## Product Specifications

Table 1 provides the specifications for the Cisco Nexus 1000V NAM Virtual Service Blade.

**Table 1.** Product Specifications

Feature	Description
<b>Supported Platforms</b>	Cisco Nexus 1000V NAM Virtual Service Blade can be installed on the Cisco Nexus 1010 appliance. For more information on the Cisco Nexus 1010 appliance, please refer to the <a href="http://www.cisco.com/en/US/products/ps10785/index.html">http://www.cisco.com/en/US/products/ps10785/index.html</a> .
<b>Supported Data Sources</b>	<ul style="list-style-type: none"> <li>• ERSPAN</li> <li>• NetFlow (versions 1, 5, 6, 7, 8, and 9)</li> </ul>
<b>Supported Interfaces</b>	<ul style="list-style-type: none"> <li>• HTTP/HTTPS with embedded web-based Cisco NAM Traffic Analyzer</li> <li>• Simple Network Management Protocol Version 1 (SNMPv1) and SNMPv2c, with standards-based applications</li> </ul>
<b>Performance</b>	<ul style="list-style-type: none"> <li>• Using the ERSPAN data source, traffic monitoring throughput of up to 386 Mbps has been characterized at an average packet size of 512 bytes for the Cisco NAM Virtual Service Blade installed on Cisco Nexus 1010 Virtual Services Appliance. Your monitoring performance may differ based on factors such as packet size, traffic burstiness, and collections enabled on the NAM. Contact your Cisco sales representative to obtain further information about NAM Virtual Service Blade performance characteristics</li> </ul>
<b>NAM Traffic Analyzer</b>	<ul style="list-style-type: none"> <li>• Web-based: Requires Microsoft Internet Explorer 7.0 or Firefox 3.0; supports both English and Japanese versions of browsers</li> <li>• Supports Secure Sockets Layer (SSL) security with up to 256-bit encryption</li> <li>• Role-based user authorization and authentication locally or using TACACS+</li> </ul>
<b>MIBs</b>	<p>The Cisco NAMs are standards-compliant and support Remote Monitoring (RMON) and RMON2 MIBs, as well as several extensions. Major MIB groups supported in the Cisco NAMs are:</p> <ul style="list-style-type: none"> <li>• MIB-II (RFC 1213) - All groups except Exterior Gateway Protocol (EGP) and transmission</li> <li>• RMON (RFC 2819)</li> <li>• RMON2 (RFC 2021)</li> <li>• SMON (RFC 2613) - DatasourceCaps and smonStats</li> <li>• DSMON (RFC 3287)</li> <li>• HC-RMON (RFC 3273)</li> <li>• Application Response Time</li> </ul>
<b>Protocols</b>	<p>Cisco NAM provides RMON2 statistics on hundreds of unique protocols, including those defined in RFC 2896 and several Cisco proprietary protocols.</p> <p>Cisco NAM automatically detects unknown protocols.</p> <p>Users have flexibility to customize the protocol directory by defining protocols on a single port or on a range of ports.</p> <p>Protocols supported include (this list is not all-inclusive):</p> <ul style="list-style-type: none"> <li>• TCP and User Datagram Protocol (UDP) over IP including IPv6</li> <li>• HTTP and HTTPS</li> <li>• SigTran and Mobile IP protocols including GPRS Tunneling Protocol (GTP)</li> <li>• Storage area network (SAN) protocols including Fibre Channel over TCP/IP</li> <li>• AppleTalk, DECnet, Novell, Microsoft</li> <li>• Database protocols, including Oracle and Sybase</li> <li>• Peer-to-peer protocols such as Gnutella, Fasttrack, and winmix</li> <li>• Bridge and router protocols</li> <li>• Cisco proprietary protocols</li> <li>• Unknown protocols by TCP/UDP ports, Remote Procedure Call (RPC) program numbers, and so on</li> </ul>

## Warranty Information

Find warranty information on Cisco.com at the [Product Warranties](#) page.

## Ordering Information

Cisco Nexus 1000V NAM Virtual Service Blade is available for purchase through regular Cisco sales and distribution channels worldwide. To place an order, visit the [Cisco Ordering Homepage](#). To download software, visit the [Cisco Software Center](#). Table 2 provides ordering information for Cisco NAM.

**Table 2.** Ordering Information for Cisco Nexus 1000V NAM Virtual Service Blade

SKU	Description
<b>N1K-C1010-NAM-4.2</b>	Cisco NAM Software 4.2 for Cisco Nexus 1000V NAM Virtual Service Blade
<b>N1K-C1010-NAM-4.2=</b>	Cisco NAM Virtual Service Blade Software 4.2 for C1010 Spare
<b>L-N1KC1010-NAM4.2=</b>	Cisco NAM Virtual Service Blade SW 4.2 for C1010 (eDelivery)

## Cisco Services

Using the Cisco Lifecycle Services approach, Cisco and its partners provide a broad portfolio of end-to-end services and support that can help increase your network's business value and return on investment. This approach defines the minimum set of activities needed, by technology and by network complexity, to help you successfully deploy and operate Cisco technologies and optimize their performance throughout the lifecycle of your network.

## For More Information

For more information about Cisco Nexus 1000V NAM Virtual Service Blade, visit: <http://www.cisco.com/go/1000nam>, contact your local account representative, or email the Cisco NAM product marketing group at [nam-info@cisco.com](mailto:nam-info@cisco.com). For additional information about the Cisco Nexus 1000V Series, visit <http://www.cisco.com/go/nexus1000v>. For more information about the Cisco NAM product family, visit <http://www.cisco.com/go/nam>.



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