Planning Cisco NAM Deployment

This chapter contains information about how to plan the deployment of NAM in your network to solve your performance and optimization goals.

This chapter contains the following sections:

- Overview of the Cisco NAM Platforms, page 2-1
- Understand the Network Performance Management Lifecycle, page 2-1
- How to Use Prime NAM to Solve Network Problems, page 2-3
- Places in the Network Where NAMs Are Deployed, page 2-4

Overview of the Cisco NAM Platforms

The portfolio of Cisco NAM models differ in memory, performance, disk size, and other capabilities. Therefore, some allow for more features and capabilities (for example, the amount of memory allocated for capture).

Throughout this guide, there may be notes explaining that some features apply only to specific platforms. If there is no note, then that feature or aspect applies to all Cisco NAM platforms.

For more information about where you may choose to deploy certain platforms, see Places in the Network Where NAMs Are Deployed, page 2-4 or Cisco.com.

For a list of Cisco NAM models and their features and capabilities, see the data sheets in Products & Services on Cisco.com.

For details on memory, performance, disk size, and other capabilities, see the NAM Compatibility Matrix.

Understand the Network Performance Management Lifecycle

In any network, the administrator must define normal and abnormal behavior patterns. Once this is accomplished, the goal is to maintain the network in its normal state and take any actions needed to prevent it from going into an abnormal state. When such an abnormal situation occurs, such as an outage, tools must be available to quickly isolate and fix the problem.
Understand the Network Performance Management Lifecycle

Figure 2-1 The Network Performance Management Lifecycle

Figure 2-1 depicts the network management performance lifecycle with the Operational Network cycle located at the center of the figure. This is where the network should ideally be at all times. The other two cycles indicate the process of repairing a network problem and the process of planning a change to the network. The following is a brief example of how Prime NAM can help you solve some of the performance management tasks:

1. **Monitor your network and report on network trends**—Use Prime NAM to focus on various network trends you want to monitor. For example, whether your business-critical applications are getting adequate network resources and operating at target performance levels. You can get proactive notification when the performance falls below an acceptable level (such as alerts by e-mail, traps, and syslogs). Configure enterprise-wide network management tools and monitoring applications to accept alerts from Prime NAM.

2. **Analyze collected data**—Use Prime NAM to collect data from a variety of sources in the network such as SPAN, RSPAN, ERSPAN, and NetFlow. The data can be analyzed in the context of the specific application, site, client, server encapsulations and overlay networks. This enables network administrators to quickly get the critical network information to accelerate operational decisions. For example, when there is a degradation for a business cortisol application, you can analyze application and network performance statistics, such as application transaction times, network round-trip times, and packet retransmit times to quickly isolate and resolve the network issue. Using these analytics you can maintain consistent visibility across physical and virtual environments.

3. **Diagnose problems and troubleshoot**—Prime NAM lets you look inside virtualization and overlay technologies such as OTV to provide traffic statistics and application performance metrics. Data can be specified by host, applications, conversations, and other ways to help you analyze and ensure effective use of these technologies. Accelerate troubleshooting with interactive reports, contextual packet captures, and real-time packet decodes.

4. **Optimize the use of network resources**—Prime NAM allows for better understanding of network traffic trends and effective use of control and optimization technologies embedded in the network. For example, while deploying QoS the visibility from NAM can help to validate whether the network behavior conforms to the implemented QoS policies. Similarly, when deploying Cisco WAAS solution, Prime NAM helps validate the benefits as a result of application and network optimization.

The goal is for all important network metrics to be within the normal ranges. Knowing the normal range of the network is a constant learning process, and as the network evolves and grows, it can be a moving target. Therefore the lifecycle described above is a continuous process of fine-tuning the network and the metrics that are most important to normal behavior.
How to Use Prime NAM to Solve Network Problems

The Cisco Prime NAM software helps you to address the following major areas:

- **Network Layer Traffic Analysis.** Prime NAM provides comprehensive traffic analysis to identify what applications are running over the network, how much network resources are consumed, and who is using these applications. Prime NAM software offers a rich set of reports with which to view traffic by Hosts, Application or Conversations. See the discussions about Dashboards, starting with Using Traffic Summary, page 4-1.

- **Application Response Time.** Prime NAM can provide passive measurement of TCP-based applications for any given server or client, supplying a wide variety of statistics like response time, network flight time, and transaction time.

- **WAN Optimization insight.** Prime NAM provides insight into WAN Optimization offerings that compress and optimize WAN Traffic for pre- and post-deployment scenarios. This is applicable for Optimized and Passthru traffic.

- **Voice Quality Analysis.** Prime NAM provides application performance for real time applications like Voice and Video. Prime NAM can compute MOS, as well as provide RTP analysis for the media stream. See Analyzing Media, page 4-28.

- **Advanced Troubleshooting.** Prime NAM provides robust capture and decode capabilities for packet traces that can be triggered or terminated based on user-defined thresholds.

- **Open instrumentation.** Prime NAM is a mediation and instrumentation product offering, and provides a robust API that can be used by partner products as well as work with customer-created applications. Contact your account representative for a copy of the Cisco Prime Network Analysis Module API Programmer’s Guide.

Prime NAM delivers the above functionality by analyzing a wide variety of data sources that include:

- **Port mirroring technology like SPAN and RSPAN/ERSPAN.** Prime NAM can analyze Ethernet VLAN traffic from the following sources: Ethernet, Fast Ethernet, Gigabit Ethernet, trunk port, or Fast EtherChannel SPAN, RSPAN, or ERSPAN source port.

- **VACL**

- **NetFlow Data Export (NDE).** Prime NAM analyzes NetFlow from Managed Devices (Routers/Switches)

- **WAAS**

- **SNMP**

- **Performance Agent (PA)**

- **Network Tap Device.** Applies to Cisco NAM appliances only.

Prime NAM uses SNMP as a southbound interface for configuration and data retrieval from switches and routers. Prime NAM uses web services as the northbound interface for data objects. The software continues to support baseline manageability features of SNMP such as MIB-2 and IF-TABLE for the NAM, and the health status and interface statistics that can be used by external products like Fault and Configuration Management offerings (for example, CiscoWorks LMS and Prime Infrastructure).

For more information about SPAN, RSPAN, and ERSPAN, see your platform configuration guide on Cisco.com. For information about which traffic sources are supported on each platform, see the Compatibility Matrix.

Table 2-1 summarizes the traffic sources that are used for Prime NAM monitoring.
Places in the Network Where NAMs Are Deployed

Because NAM is available in various form factors, it allows significant flexibility in deployment. At the same time, the available NAMs must be deployed in locations that are most effective in helping you monitor, measure, and report on the network’s health. Any location that is the ingress or egress point of a logical network boundary (aggregation layer, core, campus edge, and so on) can offer valuable insights into the network activity within that partition. Therefore, such boundary locations are usually good choices for NAM deployment.

Figure 2-2 shows various possible locations at which NAMs can be deployed. The access and distribution layers, the data center, WAN edge, and branch office are all valid choices, and you should make deployment decisions based on the specific issue at hand. The following is a list of common places in the network where NAMs are deployed and the information available at each place:

- **Data center**—Over the past few years, data center consolidation has been a common theme across enterprises. The centralized data center becomes a critical hub of activity within the enterprise network and helps cut costs, focus IT efforts in one location, and offer a rich variety of services across the enterprise. Placing a NAM in such data centers offers excellent visibility into the most business-critical applications and transactions.

- **Server farms**—Place near server farms (for example, web, FTP, and Domain Name System (DNS)), data centers, or near IP telephony devices (Cisco Unified Communications Manager), IP phones, and gateways where the Cisco NAM can monitor request-response exchanges between servers and clients and provide rich traffic analysis, including IAP.

- **Campus and WAN edge**—This location is very often a good choice—it offers visibility into traffic entering and exiting the campus. It provides a central point from which to measure voice quality of all streams leaving the campus and going across the WAN. The WAN is typically the smallest bandwidth link, and therefore, call metrics such as latency, jitter, and so on might require close monitoring for deterioration in quality. It is also an excellent location to measure WAN utilization and health metrics of various branch routers using NetFlow. Place Cisco NAMs at the WAN edge to gather WAN statistics from the Optical Services Module (OSM) or FlexWAN interfaces or to collect NetFlow packet statistics on remote NetFlow-enabled routers. This can provide usage statistics for links, applications (protocol distributions), hosts, and conversations, which can be useful for trending data and capacity planning.

- **Branch office**—Place Cisco NAMs at the edge of the branch office to troubleshoot issues at remote sites. This place offers the advantage of visibility into all traffic crossing the branch boundary. Headquarters personnel can troubleshoot issues remotely through the NAM GUI.

### Table 2-1 Summary of Traffic Sources for Prime NAM Monitoring

<table>
<thead>
<tr>
<th>Traffic Source</th>
<th>LAN</th>
<th>WAN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ports</td>
<td>VLANs</td>
</tr>
<tr>
<td>VACL capture</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>NetFlow Data Export NDE (local)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>NetFlow Data Export NDE (remote)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>SPAN</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>ERSPAN</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

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• Distribution layer—The distribution layer is typically a convergence point for traffic from smaller networks; for example, three buildings of a company might feed into a distribution layer switch. Placing the Cisco NAMs at the distribution layer allows visibility into the application trends specific to that set of buildings. In troubleshooting situations, you might start working with an edge NAM and then log in to a distribution NAM to isolate and fix the problem. Also, it is a good location to capture RTP voice streams. If phone calls in one building in the campus need to be monitored for quality, the aggregation layer is a good choice, as the switch in this layer will typically “catch” all calls being made in that building.

• Access layer—The access layer is the layer closest to users and is not a typical location for NAMs. However, with the rapid increase in network traffic over the years, it has become somewhat common to have Cisco Catalyst 6500 Series Switches in the closet of each floor. Cisco NAMs can be very useful, especially for those access layer switches that serve critical company-wide meetings or conferences and other business-critical needs. Once again, close monitoring of IP phones is a good application in this layer as well.

Figure 2-2  Places in the Network in Which NAMs Can Be Deployed