

HP Network Node Manager i Software Smart Plug-in Performance for Traffic

for the Windows® and Linux operating system

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Deployment Reference

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1 About This Guide

This guide contains a collection of information and best practices for deploying HP Network Node Manager i Software Smart Plug-in Performance for Traffic (referred to as NNM iSPI Performance for Traffic in the rest of the document). This guide is targeted to:

- NNM iSPI Performance for Traffic and Network Performance Server (NPS) system administrator
- Network engineer
- HP support
- Engineer with experience in deploying and managing traffic deployments in large installations

HP updates this deployment reference, installation guide, support matrix, and the release notes for NNM iSPI Performance for Traffic and migration guide between product releases, as soon as critical new information becomes available. For information about retrieving an updated version of this document, see Available Product Documentation.

Environment Variables that NNM iSPI Performance for Traffic Uses

This document uses the following HP Network Node Manager i Software (NNMi) environment variables that are used in NNM iSPI Performance for Traffic too. These environment variables enables you to refer to file and directory locations. The default values are listed here. Actual values depend upon the selections made during NNMi installation.

Windows

On Windows systems, the NNMi installation process creates the following environment variables so they are always available.

```
%NnmInstallDir%: <drive>\Program Files\HP\HP BTO Software
%NnmDataDir%: <drive>\Documents and Settings\All Users\Application
Data\HP\HP BTO Software
```

UNIX

On UNIX systems, you must manually create these environment variables.

```
$NnmInstallDir: /opt/OV
$NnmDataDir: /var/opt/OV
```

Other Available Environment Variables

NNM iSPI Performance for Traffic administrators can run a script that sets up many environment variables for navigating to commonly accessed locations.

To set up the extended list of the available environment variables, use a command similar to the following examples:

```
Windows: C:\Program Files\HP\HP BTO Software\bin\nnm.envvars.bat
UNIX: ./opt/OV/bin/nnm.envvars.sh
```

2 Preparation

Before installing NNM iSPI Performance for Traffic, read the following information about system hardware and software requirements described in the following table:

Table 1 Software and hardware pre-installation checklist

Document Type	Document Path
<i>HP Network Node Manager i Software Smart Plug-in Performance for Traffic Installation Guide</i>	Filename: NNMiSPI_Traffic9.00_Install.pdf
	Windows Media: DVD main drive (root)
	UNIX Media: Root directory
	NNM iSPI Performance for Traffic console: Help > NNM iSPI Documentation Library > iSPI Performance for Traffic Install Guide
<i>HP Network Node Manager i Software Smart Plug-in Performance for Traffic Release Notes</i>	Filename: Release_Notes_Traffic_SPI.htm
	Windows Media: DVD main drive (root)
	UNIX Media: Root directory
	NNM iSPI Performance for Traffic console: Help > NNM iSPI Documentation Library > iSPI Performance for Traffic Release Notes

Table 1 Software and hardware pre-installation checklist

Document Type	Document Path
<i>HP Network Node Manager i Software Smart Plug-in Performance for Traffic System and Device Support Matrix</i>	Filename: NNMiSPI_Traffic9.00_Su pportMatrix.html
	Windows Media: DVD main drive (root)
	UNIX Media: Root directory
	NNM iSPI Performance for Traffic console: Help > NNM iSPI Documentation Library > iSPI Performance for Traffic System and Device Support Matrix

For current versions of all documents listed here, go to:

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NNM iSPI Performance for Traffic ships with 60 day unlimited license. When you reach your license limit, a message informs you that your license has expired. You can extend your license when you see this message.

3 Installing Components for NNM iSPI Performance for Traffic

You must install the NNMi extension for the NNM iSPI Performance for Traffic on the NNMi management server. Also NNM iSPI Performance for Traffic integrates with Network Performance Server to monitor and portray the traffic data flowing through a network.

Deployment Considerations

Before you start deploying the NNM iSPI Performance for Traffic, you must plan the installation based on your deployment requirements. You must identify the ideal deployment scenario among the supported configurations and ensure that all the prerequisites are met before you begin the installation process.

The following factors impact the deployment of the NNM iSPI Performance for Traffic:

- Type of database configured with NNMi (embedded PostgreSQL or Oracle)
- Size of the network that you want to monitor
- Size of the Network Performance Server that stores the NNM iSPI Performance information
- The amount of network traffic handled by the routers and switches that you plan to analyze. For information on small, medium, and large scale traffic environments, see *HP Network Node Manager i Software Smart Plug-in Performance for Traffic System and Device Support Matrix*.

Refer to the documents listed in [Preparation](#) to identify your deployment requirements.

Components to Deploy

NNMi Extension

NNM iSPI Performance for Traffic should always be installed on the NNMi system. The NNMi console provides the launch points for NNM iSPI Performance for Traffic configuration, traffic maps, and licensing views. Restart NNMi after installing NNM iSPI Performance for Traffic.

Installing the Master Collector

You must have a single instance of this component installed and configured for any deployment. The master collector performs the following tasks:

- 1 Configures the Leaf Collectors.
- 2 Receives summarized traffic flow data from the Leaf Collectors.
- 3 Queries NNMi to retrieve topology information.
- 4 Creates files that are used by the NNM iSPI Performance for Metrics and Network Performance Server for reporting purposes.

Possible Deployment Scenarios

- NNMi, NNM iSPI Performance for Metrics, Network Performance Server, and Master Collector are installed on the same system.
- NNMi and Master Collector are installed on the same system, while NNM iSPI Performance for Metrics and Network Performance Server are installed a different system.
- NNMi is installed on one system, while NNM iSPI Performance for Metrics, Network Performance Server, and Master Collector are installed on another system.
- NNMi, NNM iSPI Performance for Metrics, and Network Performance Server are installed on one system, while the Master Collector is installed on another system.
- NNMi is installed on one system, NNM iSPI Performance for Metrics, and Network Performance Server are installed on another system, while the Master Collector is installed in a different system. For example, NNMi is installed on System A, NNM iSPI Performance for Metrics, and Network Performance Server are installed on System B, and the Master Collector is installed on System C.

If you do not have NNM iSPI Performance for Metrics installed with Network Performance Server, the Network Performance Server acts as a reporting server for NNM iSPI Performance for Traffic and reports only on the network traffic data.

If NNMi and the Master Collector are installed on different systems, you must share the directory `<NNMDataDir>/shared/perfSpi/datafiles`. For information on how to share this directory on the NNMi system, see the *HP Network Node Manager i Software Smart Plug-in Performance for Traffic Installation Guide*.

Deployment Best Practices

Master collector integrates closely with NNM iSPI Performance for Metrics and Network Performance Server. Thus, you should adopt any one of the following scenarios:

- NNMi and the Master Collector should be on the same system.
- The Master Collector should be installed on the same system with NNM iSPI Performance for Metrics and Network Performance Server.
- In a large scale environment, you should install NNMi on one system and NNM iSPI Performance for Metrics or Network Performance Server, and Master Collector on a different system. For information on small, medium, and large scale traffic environments, see *HP Network Node Manager i Software Smart Plug-in Performance for Traffic System and Device Support Matrix*.

Installing the Leaf Collector

Leaf Collectors interact only with the Master Collector. Irrespective of how the Master Collector is deployed, you can adopt any of the following deployment scenarios for the Leaf Collectors:

- The Leaf Collectors and the Master Collector are both installed on the same system.
- The Master Collector is installed on one system, while the Leaf Collectors are installed on different systems.

If you install multiple Leaf Collectors on different systems, none of them should be installed on the system where the Master Collector is installed.

4 Deploying NNM iSPI Performance for Traffic

Follow these steps to deploy NNM iSPI Performance for Traffic:

Step 1: Set up the system

Follow these steps to set up the NNM iSPI Performance for Traffic system:

- 1 Seed the routers/switches identified to export flow records in NNMi. Ensure that they are correctly discovered.
- 2 List the Leaf Collector systems that would receive the flow records from these devices. For each system record the IP address and the port to which the device will export flow.
Ensure that one router/switch exports data to only one Leaf Collector.
- 3 Start the Master Collector and the Leaf Collector processes.
- 4 Log on to the NNM iSPI Performance for Traffic Configuration UI.
- 5 Add one Leaf Container for each system on which the Leaf Collector is installed. Configure the FQDN and password for the Leaf Container
- 6 Configure Leaf Collectors using the NNM iSPI Performance for Traffic Configuration UI. For each Leaf Collector, specify the following information:
 - The Leaf Container system that the Leaf Collector will use
 - The IP address and the port to which the individual Leaf Collector should interact, in order to receive flow packets
You can specify 0.0.0.0 for the Leaf Collector also. This enables the Leaf Collector to receive flow packets from all available IP addresses on that Leaf Collector system.
 - Flush Period of a few minutes. Typically this period ranges from three to five minutes.
- 7 Configure each of the routers/switches to export flow data for a set of their interfaces to a specific IP address and port for a Leaf Collector. Each router/switch should export data to only one Leaf Collector instance.

After completing step 5 the system starts processing the flow packets and populating the Network Performance Server database for reporting and displaying the map views

Deployment Best Practice

You should have one Leaf Collector for each Leaf Container.

It is possible to have multiple Leaf Collectors for one Leaf Container only if the number of incoming flow records falls in the Entry-Medium range. For information on the environment sizing, see *HP Network Node Manager i Software Smart Plug-in Performance for Traffic System and Device Support Matrix*.

Step 2: Verify the Leaf Collector

Follow these steps to verify that the Leaf Collector is receiving and processing the flow data:

- 1 Inspect that the Leaf Collector is receiving data from the routers and processing them accordingly. Check the following log file for the Leaf Collector:

Windows: %NnmDataDir%\log\traffic-leaf\traffic_spi_leaf_<m>.log.<n>

UNIX: \$NnmDataDir/log/traffic-leaf/traffic_spi_leaf_<m>.log.<n>

This log file stores information about the processed every two minutes. Ensure that the messages are stored in a form as specified in the following example:

```
INFO: Datagram Packets: Total received in last 2 min: 18 Packets
```

```
INFO: Rule Engine: Total Processed in last 2 min: 466 Records
```

- 2 Check the last flush time of the Leaf Collector in the Collector Statistics tab of the Leaf Collector Detail form to verify that the Leaf Collector is processing the flow packets and sending the data to the Master Collector. The tab displays the following:
 - Number of flow records the Leaf Collector has flushed to the Master Collector in the last ten flush periods.
 - The timestamps of these flushes.
- 3 Check the Collector Statistics tab of the Leaf Collector Detail form to verify the number of records flushed from the Leaf Collector to the Master Collector.

Step 3: Verify the Master Collector

Follow these steps to verify that the Master Collector is receiving and processing the flow data:

- 1 Inspect that the Master Collector is receiving data from the flow record sources and processing them accordingly. Check the following log file for the Master Collector:

Windows:

%NnmDataDir%\log\traffic-master\traffic_spi_master_<n>.log.<m>

UNIX: \$NnmDataDir/log/traffic-master/traffic_spi_master_<n>.log.<m>

This log file stores information about the processed every two minutes. Ensure that the messages are stored in a form as specified in the following example:

```
INFO: Received records from leaf 455 collector name = <collector name>
```

- 2 Check the Master Collector log file to ensure that the Master Collector is storing the flow record data to the files to be consumed by the Network Performance Server. Ensure that the messages are stored in a form as specified in the following example:

```
INFO: 1,000 Num records flushed to the file
```

```
C:\NMS_DATA\shared\traffic-master\tmp\metric\working\Interface_Traffic_Data
```

```
INFO: Trying to rename
C:\NMS_DATA\shared\traffic-master\tmp\metric\working\Interface_Traffic_Data to
C:\NMS_DATA\shared\perfSpi\datafiles\metric\final\Interface_Traffic_Data_830166616702402.gz
```

```
INFO: Rename successfully done for
C:\NMS_DATA\shared\perfSpi\datafiles\metric\final\Interface_Traffic_Data_830166616702402.gz
```

- 3 Check the last flush time of the Leaf Collector in the Collector Statistics tab of the Leaf Collector Detail form to verify that the Master Collector is receiving the flow packets and from the Leaf Collectors.
- 4 Check the Collector Statistics tab of the Leaf Collector Detail form to verify the number of records flushed to the Master Collector from the Leaf Collector.

Step 4: Verify the Data Uploaded into Network Performance Server

Follow these steps to verify that the Master Collector is receiving and processing the flow data:

- 1 Select the **Report** menu from the NNMi console.
- 2 Select the tab **Interface_Traffic**.
- 3 Launch the Chart Detail or Top N report to view the data collected for a specific time range.

5 Deployment Tuning and Sizing

While tuning the NNM iSPI Performance for Traffic, you must tune the Master Collector first, and then the Leaf Collectors.

Tuning the Master Collector

The Traffic Master Collector is the central receiver of summarized traffic data from the following sources:

- Leaf Collectors configured to send data to the Traffic Master Collector
- Regional (remote) Master Collectors configured to send data to the Traffic Master Collector
- Leaf Collectors of regional (remote) Master Collectors configured to send data to the Traffic Master Collector

The primary factor to consider when sizing and tuning for optimal performance is the volume of incoming traffic data from all its collector sources.

Compute the total incoming flow of records to the Master Collector for a specific time range. Follow any of these methods to tune the Master Collector:

If only Leaf Collectors are configured

- 1 View the number of flow records a Leaf Collector has flushed to the Master Collector in the last ten flush periods in the Collector Statistics tab of the Leaf Collector Detail form.
- 2 Compute the average incoming flow to the Master Collector from each Leaf Collector for each flush period.
- 3 Add all the averages to arrive at the average incoming flow record rate for each flush period.

If the remote Master Collector and Leaf Collector sources are configured

- 1 View the number of records received from each source including remote sources from the following Master Collector log file:

Windows:

```
%NnmDataDir%\log\traffic-master\traffic_spi_master_<n>.log.<m>
```

UNIX: \$NnmDataDir/log/traffic-master/traffic_spi_master_<n>.log.<m>

- 2 Record the number of flow records received from each unique source for each flush.
- 3 Add the number of flow records received from all the sources for each flush period.

Parameters to Tune

Tune the following parameters for optimal Master Collector operation based on the total incoming flow records for each flush period:

Considering the total number to be N ,

- Define the Flush Record Limit of the Master Collector to be $N/5$ or 50,000, whichever is less. Flush Record Limit is the number of records in each output file of the Master Collector.

Example

— If N is 1,00,00,00, configure the Flush Record Limit to be 2,00,000.

— If N is 50,000, configure the Flush Record Limit to be 50,000.

- The `nms.traffic.master.maxflowrecord.inqueue` parameter controls the number of aggregated flow records the Master Collector can keep in the memory space. You must set the value of the this parameter to $2.5 * N$.

File name: `nms-traffic-master.adress.properties`

File location: `<%TrafficDataDir%\shared\traffic-master\conf>`

Tuning the Traffic Leaf Collector

The Leaf Collector is primarily a packet processing engine and thus needs to be tuned based on the number of incoming flow records that it is receiving over a flush period.

- 1 View the number of flow records the Leaf Collector has flushed to the Master Collector in the last ten flush periods. You can view this number in the Collector Statistics tab of the Leaf Collector Detail form.
- 2 Compute the average incoming flow from the Leaf Collector to the Master Collector for each flush period.
- 3 Set the `flowrecord.pool.size` parameter to at least three times the maximum number of flow records exported to the Master Collector during a single flush period

File name: `nms-traffic-leaf.adress.properties`

File location: `< %TrafficDataDir%\shared\traffic-leaf\conf>`

Sizing

- 1 Compute the number of flow records processed by a Leaf Collector by using the method discussed in [Tuning the Traffic Leaf Collector](#).
- 2 Compute the number of flows being processed at the Master Collector by using the method discussed in [Tuning the Master Collector](#).

For information on the CPU, memory, and hard disk sizing based on the number of incoming flows, see *HP Network Node Manager i Software Smart Plug-in Performance for Traffic System and Device Support Matrix*.

6 Deploying NNM iSPI Performance for Traffic in HA and Application Failover Environment

The following scenarios discuss about installing NNM iSPI Performance for Traffic in high-availability cluster and application failover environment.

Deploying NNM iSPI Performance for Traffic in High-Availability (HA) Cluster Environment

You can install NNMi in HA environment to achieve redundancy in your monitoring setup. You can install the iSPI product in an HA environment where NNMi is installed.

Prerequisites

Before you begin installing NNM iSPI Performance for Traffic for the HA environment, read *Configuring HP NNM i-series Software in a High Availability Cluster* in the *NNMi Deployment and Migration Reference* to understand the NNMi HA configuration.

NNM iSPI Performance for Traffic 9.00 does not support HA. You cannot configure NNM iSPI Performance for Traffic to support failover in an HA cluster environment. However, it can exist in an environment where NNMi and Network Performance Server are installed in HA environment.

The supported deployment scenarios for NNM iSPI Performance for Traffic in HA environment are:

Scenario 1

- NNMi is installed on Server A in an HA environment.
- NNM iSPI Performance for Metrics, Network Performance Server, NNM iSPI Performance for Traffic Master Collector, and Leaf Collectors are installed on separate systems outside the HA environment.

Scenario 2

- NNMi is installed on Server A in an HA environment.
- NNM iSPI Performance for Metrics and Network Performance Server are installed on Server B in the HA environment.
- NNM iSPI Performance for Traffic Master Collector, and Leaf Collectors are installed on separate systems outside the HA environment.

Scenario 3

- NNMi, NNM iSPI Performance for Metrics and Network Performance Server are installed on Server A in an HA environment
- NNM iSPI Performance for Traffic Master Collector and Leaf Collectors are installed on separate systems outside the HA environment.

The NNM iSPI Performance for Traffic Master and Leaf Collectors must be non-co-located with the HA systems.

Please refer to the *HP Network Node Manager i Software Smart Plug-in Performance for Traffic Installation Guide* for details on non-co-located installs.



- You must install the Traffic Master Extension for NNMi on all the HA systems.
- You must install the NNM iSPI Performance for Traffic licenses on all the HA systems.
- You must configure the Master Collector to point to the following:
 - The NNMi instance (provide the virtual hostname)
 - The network share drive where the NNM iSPI Performance for Metrics data files folder on the HA system is shared.

Deploying NNM iSPI for Traffic in an Application Failover Environment

NNM iSPI Performance for Traffic 9.00 does not support HA and cannot be configured to support application failover. However, it can exist in an environment where NNMi and Network Performance Server are installed in HA environment. The deployment configuration supported in this case are:

- NNMi is installed in an application failover environment, as primary and secondary instances on two separate systems.
- The NNM iSPI Performance for Traffic Master and Leaf Collectors are installed on separate non-co-located systems.
- Only one instance of a Master Collector should be co-located with the NNM iSPI Performance for Metrics and Network Performance Server.
- The Traffic Master Extension for NNMi should be installed on both the primary and secondary systems.
- The NNM iSPI Performance for Traffic licenses must be installed on both primary and secondary systems.
- The Master Collector must be configured on both primary and secondary systems to point to the following:
 - The NNMi instance (provide the virtual hostname)
 - The network share drive where the NNM iSPI Performance for Metrics data files folder on the HA system is shared.

Please refer to the Master Collector Installation Guide for details on configuring secondary NNMi server.

7 Deploying NNM iSPI Performance for Traffic in Global Network Management Environment

NNM iSPI Performance for Traffic offers full support for deployment in a Global Network Management environment. Each instance has the following components:

- NNMi
- NNM iSPI Performance for Metrics and Network Performance Server
- The NNM iSPI Performance for Traffic Master Collector
- The NNM iSPI Performance for Traffic Leaf Collectors

The NNMi in the Global Manager receives data from the Regional Managers. The Traffic Master Collector in the Global Manager can be configured to receive data from the Regional Traffic Master Collectors in the following ways:

- The Traffic Master Collector in the Global Manager can receive data from the Traffic Master Collector in the Regional Manager. In this case, you must add the regional Traffic Master Collector as a remote Master source in the global Traffic Master Collector. This ensures that the complete set of data received by the regional Master Collector is forwarded to the global Traffic Master Collector. In the above scenario the global Traffic Master Collector receives data processed by both Traffic Leaf 1 and Traffic Leaf 2.
- The Traffic Master Collector in the Global Manager can receive data directly from a regional Leaf Collector system, bypassing the regional Traffic Master Collector. In this case the regional Traffic Leaf Collector (Traffic Leaf 3 in the above scenario) can be added as a leaf remote source to the global Master collector. This will ensure that the data received by all the Leaf Collectors on the remote Leaf Collector system is sent to the regional Traffic Master Collector as well as the global Traffic Master Collector.

The regional Traffic Master Collector or the regional Traffic Leaf Collector) can only be configured to send data to the global Traffic Master Collector. The global Master Collector cannot administer and manage these components.

Deployment Best Practice

Add all the regional Master Collectors as remote Master sources to the global Master Collector.

A Troubleshooting

This chapter lists some of the issues that you may encounter while deploying NNM iSPI Performance for Traffic and the possible resolutions. For more information on troubleshooting NNM iSPI Performance for Traffic, see *HP Network Node Manager i Software Smart Plug-in Performance for Traffic Installation Guide*.

Problem Statement

Leaf Collector status shows as NOT_RUNNING on the Master Configuration form.

Resolution

- 1 Check the password entered while creating the Leaf Container. It should match the password entered while installing the Leaf component on the system where the container is configured.
- 2 Check if the Leaf Collector process is running on the system hosting it.
- 3 Check if the Leaf Container system is reachable from the Master Collector system

Add an entry for the FQDN->IP address mapping for the Leaf Container system on the Master Collector system

Problem Statement

Leaf collector is not processing any packets

Resolution

- 1 Check the Leaf Collector to log for any exceptions or errors related to binding to an IP address and port
- 2 Ensure that you have the Windows firewall settings to accept traffic and check Windows website to get the correct settings. Symantec Antivirus protection needs to be disabled on the Leaf Collector system.
- 3 Check if packets are coming to the designated port and bind IP address on the Leaf Collector system.
- 4 The Leaf Collector log shows the error in getting objects from pool. Increase the flowrecord.pool.size to double its current value in the following file:

Windows: %NNMDataDir%/log/traffic-leaf/jbossServer.log

UNIX: \$NNMDataDir/log/traffic-leaf/jbossServer.log

Problem Statement

Master collector is receiving data from the Leaf Collectors but no output is sent to the Network Performance Server.

Resolution

- 1 Check if there is a message indicating that it could not lookup an IP address. If present this indicates that the router exporting flow is not seeded in NNMi.

A message in the following file in the Master Collector indicates the IP address of the router or switch for which it could not lookup the NNMi node instance:

Windows: %NNMDataDir%\log\traffic-master\jbossServer.log

UNIX: \$NNMDataDir/log/traffic-master/jbossServer.log

- 2 Check if the files are getting written to the <NNMDataDir>/shared/perfSpi/datafiles directory or the shared drive if the Master Collector is on a different system than the NNMi management server.

The following log file stores the messages indicating that topology and metric data files for traffic are created:

Windows:

%NNMDataDir%\log\traffic-master\traffic_master_spi_<n>.log.<m> in the %NNMDataDir%\shared\perfSPI\datafiles\topology\final and %NNMDataDir%\shared\perfSPI\datafiles\metric\final directories.

UNIX: \$NNMDataDir/log/traffic-master/traffic_master_spi_<n>.log.<m> file in the \$NNMDataDir/shared/perfSPI/datafiles/topology/final and \$NNMDataDir/shared/perfSPI/datafiles/metric/final directories.

- 3 The global Master collector is unable to add the regional Master Collectors and Leaf Collectors as remote sources. The status is displayed as Down and no data is received.
- 4 On the Traffic Master Collector system, add an entry for both the FQDN as well as the hostname of the regional Master Collector and Leaf Collector system for IP address resolution.
- 5 Check if the remote Master Collector and Leaf collector is running correctly and the system is reachable from the global Master Collector system.

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