HP Network Node Manager iSPI Performance for Quality Assurance Software

For the Windows ® , HP-UX, Linux, and Solaris operating systems

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Online Help

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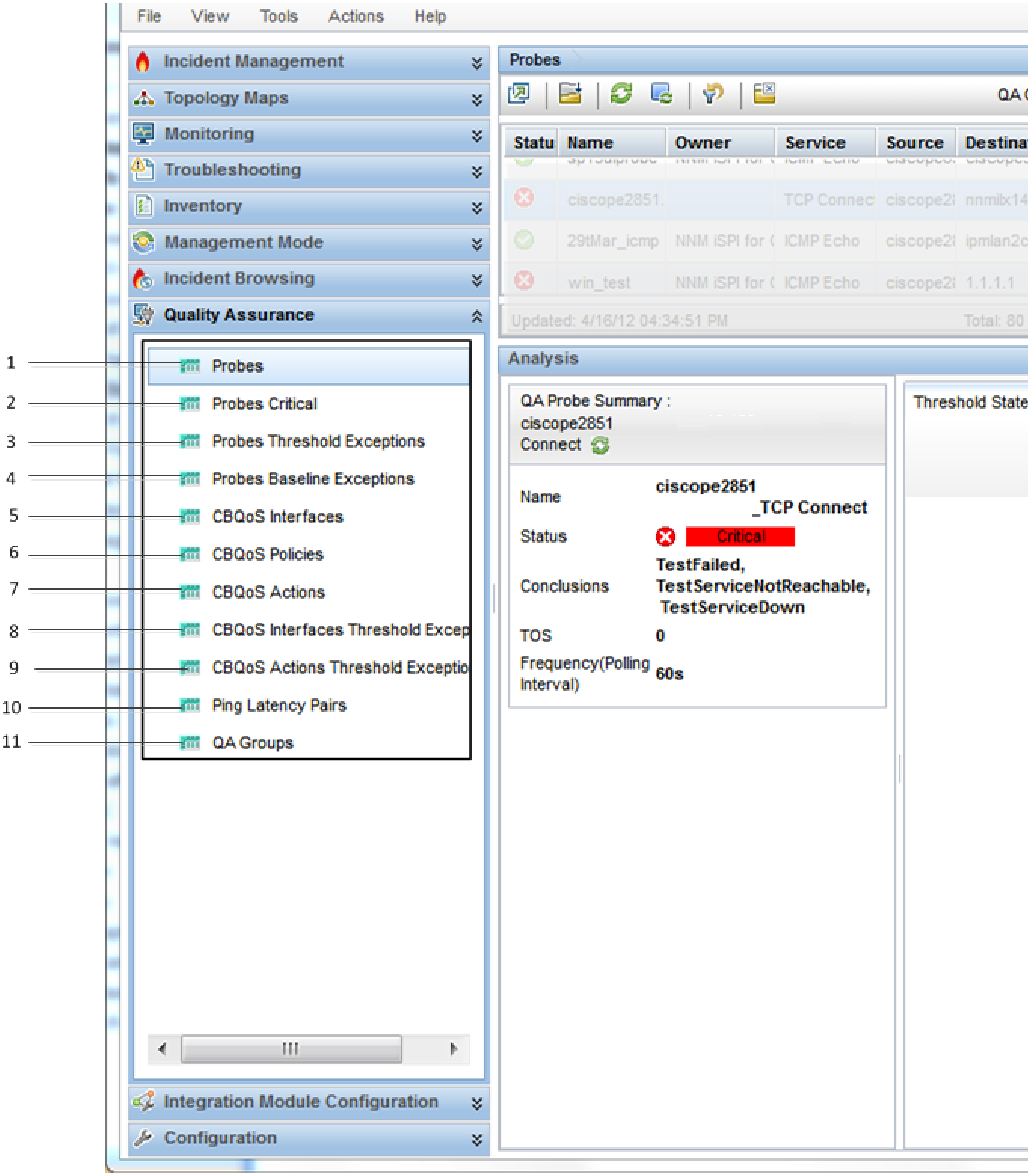
Contents

NNM iSPI Performance for QA Help for Operators

NNM iSPI Performance for QA enables you to do the following:

- View the performance of each node in your network and the connectivity between multiple nodes using the Global Node Response View.
- View the performance of each site in your network and the connectivity between multiple sites using the Site Map.
- Discover the QA probes configured in the nodes managed by NNMi.
- Monitor the network performance and view the threshold state of the metric in the NNMi console.
- Analyze the outcome of each QA probe and generate reports up to a maximum period of 13 months.
- Identify the QA probes that violated the threshold for any metric.
- Discover, list, and monitor the CBQoS interfaces and policies. You can also analyze the mapping between these policies, classes and CBQoS interfaces available in the network and the CBQoS policies and actions applied on the CBQoS interfaces.
- Discover, list, and monitor the ping pair nodes configured on the network.
- View the QA probes an CBQoS elements based on the QA Groups configured using NNM iSPI Performance for QA.

The following diagram and table explain the main tasks that the Quality Assurance workspace enables you to perform:



Statu	Name	Owner	Service	Source	Destina
✗	ciscope2851.		TCP Connec	ciscope2	nnmilx14
✓	29tMar_icmp	NNM iSPI for (	ICMP Echo	ciscope2	ipmlan2c
✗	win_test	NNM iSPI for (	ICMP Echo	ciscope2	1.1.1.1

Updated: 4/16/12 04:34:51 PM Total: 80

QA Probe Summary :
ciscope2851
Connect

Name	ciscope2851 _TCP Connect
Status	✗ Critical
Conclusions	TestFailed, TestServiceNotReachable, TestServiceDown
TOS	0
Frequency(Polling Interval)	60s

Legend	Task
1	Accessing the QA Probes Inventory View

2	Accessing the Critical QA Probes Inventory View
3	Accessing the Threshold Exceptions Probes Inventory View
4	Accessing the Baseline Exceptions Probes Inventory View
5	Accessing the CBQoS Interfaces Inventory View
6	Accessing the CBQoS Policies Inventory View
7	Accessing the CBQoS Actions Inventory View
8	Accessing the CBQoS Threshold Exceptions Actions Inventory View
9	Accessing the CBQoS Threshold Exceptions Actions Inventory View
10	Accessing Ping Latency Pairs Inventory View
11	Accessing the QA Groups Inventory View

Accessing the Quality Assurance Workspace

After you install HP Network Node Manager iSPI Performance for Quality Assurance Software, a new workspace for Quality Assurance gets added to your NNMi console.

The Quality Assurance workspace displays all the QA probes discovered in the network.

You can launch the detailed information on a selected QA probe using this workspace.

To launch the Quality Assurance workspace:

1. Log on to NNMi console using your username and password.

   User roles determine access to the NNMi console workspaces, forms, and actions. NNMi provides the following roles. It is not possible to create additional roles or change the names of the roles provided by NNMi:

   - Administrator
   - Operator Level 2
   - Operator Level 1
   - Guest

   You should not use the System role or Web Service Client role. NNMi provides the System role for accessing NNMi the first time during installation and for command line access. NNMi provides a special Web Service Client role to provide access for software that is integrated with NNMi.

   See "*Set Up Command Line Access*" in *HP Network Node Manager i Software Online Help* for more information

2. Click **Quality Assurance** in the Workspaces panel. The Quality Assurance tab expands, displaying the QA Probes view, Critical Probes view, Threshold Exceptions Probes view, and Baseline Exceptions Probes view.

Filtering and Sorting Data in Inventory Views

You can filter and sort data in the workspace to categorize and view the relevant information.

The filters configured on the views are restored when the views are opened again. This is very useful as you do not have to configure the filtering option again.

Filtering is enabled only for limited columns.

To filter a column in the Quality Assurance workspace, right-click the column name and select a filtering option.

> **Note:** Right click the column and select **Remove Filter** to clear the filter configured on the column.

The following table displays the values based on which you can filter the QA Probes view columns:

Column Name	Allowed Filters	Disallowed Filters	Lowest Value	Highest Value
Status	• Equals `<value>` • Not equals `<value>`	• Is Empty • Not Empty • Contains • Matches	No Status	Critical
Name	• Equals `<value>` • Not equals `<value>`	• Is Empty • Not Empty	No lowest value	No highest value
Owner	• Equals `<value>` • Not equals `<value>`	• Is Empty • Not Empty	No lowest value	No highest value
Service	• Equals `<value>` • Not equals `<value>`	• Is Empty • Not Empty	ICMP Echo	UDP
Source Site	• Equals `<value>`	No disallowed filter	No lowest value	No highest value

	• Not equals <value> • Is Empty • Not Empty			
Destination Site	• Equals <value> • Not equals <value> • Is Empty • Not Empty	No disallowed filter	No lowest value	No highest value
Tenant	• Equals <value> • Not equals <value> • Is Empty • Not Empty	No disallowed filter	No lowest value	No highest value
RTT	• Equals <value> • Not equals <value> • Is Empty • Not Empty	• Contains • Matches	0	Not Applicable
Jitter	• Equals <value> • Not equals <value> • Is Empty • Not Empty	• Contains • Matches	0	Not Applicable

Packet Loss	• Equals `<value>` • Not equals `<value>` • Is Empty • Not Empty	• Contains • Matches	0	Not Applicable
Manager	• Equals `<value>` • Not equals `<value>` • Is Empty • Not Empty	No disallowed filter	No lowest value	No highest value

NNM iSPI Performance for QA enables you to create customized filters using the Create Filter utility.

You can use this utility only for the Status, RTT, Jitter, and Packet Loss columns.

To create a custom filter, follow these steps:

1. Right-click on the column heading for Status,RTT, Jitter, or Packet Loss columns and select **Create Filter...**
2. Select one or more values for Equals or Not Equals filters.

   Equals

   When you select the option **Equals**, NNM iSPI Performance for QA filters the workspace based on any or all of the specified values.

   Example

   You want to display those QA probes that has a high **Round Trip Time (RTT)** or a high Packet Loss.

   You can create a filter for the RTT column that specifies "`Equals High`" and a filter for the Packet Loss column that specifies "`Equals High`".

   The workspace will display the following types of QA probes:

   The QA probes that have a high RTT

   The QA probes that have a high packet loss

   The QA probes that have both high RTT and packet loss.

Not Equals

When you select the option **Not Equals**, NNM iSPI Performance for QA filters the workspace based on all of the specified values.

Example

You want to display those QA probes that neither has a high **Round Trip Time (RTT)** nor a high Packet Loss.

You can create a filter for the RTT column that specifies "`Not Equals High`" and a filter for the Packet Loss column that specifies "`Not Equals High`".

The workspace will display only those QA probes that neither have high RTT nor high packet loss.

3. Select **Apply**.

Sorting Data in the Inventory Views

You can sort a workspace column in ascending or descending order.

Sorting is enabled only for limited columns.

By default the workspace is sorted based on the Status column.

To sort a column in the Quality Assurance workspace, right click on the column name and select a sorting option.

Click the ↻ Restore Default Settings icon to sort the workspace based on the default column.

Multi-Tenancy Architecture in NNM iSPI Performance for QA

The NNM iSPI Performance for QA supports multitenant architecture configured in NNMi. In NNMi, a tenant is the top-level organization to which a node belongs. Tenants enable you to partition your network across multiple customers. The NNMi administrator can restrict visibility and control to parts of the network for some or all operators. This feature restricts the access to certain objects such as QA Probes, Sites, and CBQoS elements in NNM iSPI Performance for QA based on the tenant configuration, security group configuration, and user group configuration in NNMi.

The security group defined for a node in NNMi is also applicable for the QA probes and CBQoS elements hosted on the node. This implies that all QA probes and CBQoS elements cannot be viewed by all users either in a table view or a form view. For example, if a user has access to a set of nodes, the user can view only the QA probes and CBQoS elements configured on those nodes.

A user can view a source site and destination site only if atleast one of the QA probes or CBQoS elements associated with the source site can be accessed by the user. A user can view the site map only if any one of the QA probes or CBQoS elements of the site can be accessed by the user. In addition, a user can view the Real Time Line graph only if the source node or the QA probe can be accessed by the user.

A user cannot view all the incidents. A user can view only those incidents whose source node, QA probe, or CBQoS element can be accessed by the user.

Multitenancy is also applicable for the Network Performance Server and restricts a user to view reports on only selective QA probes and CBQoS elements. For example, while generating Top N report, a user can view the report for the probes and CBQoS elements that can be accessed by the user.

Multitenant architecture establishes a node to tenant association and determines the nodes that can be accessed by the user. As an administrator, you can configure the QA probes for a source node irrespective of whether you can access the destination node.

An administrator can create, update, and delete all configurations whereas other users can only view the configuration details, and no multitenancy is required as the configuration is allowed based on the user group.

See the topic *Configuring Security* in the *NNMi Online Help* for more information on Tenants and Security Groups.

NNM iSPI Performance for QA QA Probes

NNM iSPI Performance for QA does not poll the QA probes for the nodes that have any of the following management modes:

- Not Managed: Indicates that the node is not managed on purpose.
- Out of Service: Indicates that a node is unavailable because it is out of service.

NNM iSPI Performance for QA monitors the network performance at the packet level with the following metrics:

- Round Trip Time (RTT)
- Jitter
- Packet Loss (Can be from source to destination, destination to source, or two way.)
- Mean Opinion Score (MOS)

For information on metrics, see the topic NNM iSPI Performance for QA Metrics in the *HP Network Node Manager iSPI Performance for Quality Assurance Software Reports Online Help*.

NNM iSPI Performance for QA enables to monitor the network performance for the devices that support the following MIBs:

- CISCO-RTTMON-MIB
- DISMAN-PING-MIB
- JNX-RPM-MIB

NNM iSPI Performance for QA supports the following vendor- specific technologies:

- CISCO IP SLA
- JUNIPER RPM
- Other vendors supporting the DISMAN Ping using RFC 4560
- HP H3C devices[1]

NNM iSPI Performance for QA discovers the following types of QA probes:

[1] Enables you to discover and monitor Network Quality Analyzer(NQA) probes using the DISMAN-PING-MIB. However, you cannot configure QA pobes on such devices using NNM iSPI Performance for QA

- DNS
- HTTP and HTTPS
- ICMP Echo
- Oracle
- TCP Connet
- UDP Echo
- UDP (Not supported by HP H3C devices)
- VoIP (Not supported by HP H3C devices)

NNM iSPI Performance for QA supports the multitenant architecture of NNMi. The security group and tenants configured in NNMi is also applicable for the QA probes in NNM iSPI Performance for QA. See the topic *Configuring Security* in the *NNMi Online Help* for more information on Tenants and Security Groups.

To perform a basic monitoring of the quality of your network traffic performance, follow the steps as discussed below:

Log on to the NNMi console with the operator (level 1 or 2) or guest credentials. After you log on to the NNMi console, you can view the NNM iSPI Performance for QA workspace.

You can access the inventory view to monitor the status and necessary details for the preconfigured QA probes in every device in your network.

Accessing the QA Probes Inventory View

The QA Probes view displays all the QA probes configured in the **network elements**[1]. The QA probes are discovered by the NNMi polling process.

To launch the QA Probes view:

1. Log on to NNMi console using your username and password.
2. Click **Quality Assurance** in the Workspaces panel. The Quality Assurance tab expands, displaying the QA Probes view. Click the QA Probes view to display the QA probes discovered in your network.

The NNM iSPI Performance for QA supports Multi-Tenancy architecture configured in NNMi. The security group defined for a node in NNMi is also applicable for the probes of the node in NNM iSPI Performance for QA. This implies that all QA probes cannot be viewed by all users. For example, if a user has access to a set of nodes, the user can view only the QA probes configured on those nodes.

To manage large number of QA probes, use the **QA Groups** list to filter the QA probes based on various QA groups.

Apart from the menu bar, you can perform some of the actions by following the step below:

Right click on the probe(s), and select **Quality Assurance** option and the required sub-menu to perform the action.

[1] Some examples of network elements are routers, switches, and phone connections

Key Attributes of the QA Probes View

The QA Probes view displays the following key attributes for each QA probe and displays information for a specific time interval.

The default time interval to refresh is 300 seconds, or 5 minutes.

Attribute Name	Description
Status	The status that the QA probe returned. NNM iSPI Performance for QA calculates the status based on the polling status of the nodes and the threshold states. A QA probe may return any of the following statuses : • Normal • Warning • Major • Critical • Unknown • Disabled • Not Polled • No Status For more information on status, see the topic QA Probe Status
Name	The name of the discovered QA probe configured in the network device
Owner	The name of the discovered QA probe's owner.
Service	The type of the discovered QA probe Some of the QA probe types that the HP Network Node Manager iSPI Performance for Quality Assurance Software recognizes are as follows: • **UDP Echo** • **ICMP Echo** • **UDP** • **TCP Connect** • **VoIP**

Attribute Name	Description
Source	The source device in which the probe is configured
Destination	The destination network device till which the probe is configured
Source **Site**[1]	The source site to which the configured probe is associated.
Destination Site	The destination site to which the configured probe is associated.
RTT	The round-trip time used by the selected QA probe Displays any one of the following threshold states for the metric High Nominal Low Not Polled Unavailable Threshold Not Set None
Jitter	The **delay**[2] variance for a data packet to reach the destination device or site Displays any one of the following threshold states for the metric High Nominal Low Not Polled Unavailable Threshold Not Set None

[1] A logical organization of networking devices. In the scope of enterprise networks, a site can be a logical grouping of networking devices generally situated in similar geographic location. The location can include a floor, building or an entire branch office or several branch offices which connect to head quarters or another branch office via WAN/MAN. Each site is uniquely identified by its name. In case of the service provider networks the Virtual Routing and Forwarding (VRF) on a Provider Edge (PE) router or a Customer Edge (CE) routers can be defined as a site.

[2] The time taken for a packet to travel from the sender network element to the receiver network element.

Attribute Name	Description
PL (Packet Loss)	The percentage of packets that failed to arrive at the destination. Displays any one of the following threshold states for the metric High Nominal Low Not Polled Unavailable Threshold Not Set None
Manager	Specifies whether the NNMi management server is Local or specifies the name of the Regional Manager
Tenant	Specifies the NNMi tenant selected for the QA probe

The RTT, Jitter, and PL columns display the most recent network performance states. Apart from this, MOS metric is also considered for the change in the network performance state.

The following table describes the threshold state or network performance state values:

Threshold States

State	Description
High	*For Count-Based Threshold Configuration:* Indicates that the measured value of the metric is above the configured High Value and recurs for the consecutive number of times specified in the Trigger Count *For Time-Based Threshold Configuration:* Indicates that the measured value of the metric is above the configured High Value and this high value persists for the specified High Duration within the High Duration Window
Nominal	Indicates that the measured value of the metric is within the normal healthy range
Low	*For Count-Based Threshold Configuration*: Indicates that the measured value of the metric is below the configured Low Value for the consecutive number of times specified in the Trigger Count *For Time-Based Threshold Configuration:* Indicates that the measured value of the metric is below the configured Low Value and this low value persists for the specified Low Duration within the Low Duration Window.

State	Description
	Typically, this threshold state is applicable for metrics like Mean Opinion Score (MOS).
Not Polled	Indicates that the metric is intentionally not polled. Some of the possible reasons are: • Performance Monitoring is notMean Opinion Score (MOS) enabled, because of current Communication Configuration settings in NNMi • The parent Node or Interface is set to Not Managed or Out of Service.
? Unavailable	Unable to compute the metric or the computed value is outside the valid range
Threshold Not Set	Indicates that the threshold is not set for the metric
None	*For Count-Based Threshold Configuration:* Indicates that the measured value of the metric is zero, and recurs for the consecutive number of times specified in the Trigger Count *For Time-Based Threshold Configuration:* Indicates that the measured value of the metric is zero and this zero value persists for the specified duration within the High or Low Duration Window (depending on the metric).

> **Note:** If you launch the Status Poll command from NNMi, it triggers a corresponding status poll for NNM iSPI Performance for QA as well.

Analysis Pane

Select the QA probe by clicking on the QA probe in the QA Probes View to view the Analysis Pane. The Analysis pane of the selected QA Probe appears below.

In the **Analysis** pane, you can view the summary, Threshold State, Baseline State, Latest Polled Values, and Performance panels.

The summary includes details such as the Status of the QA probe, Conclusions, Name of the QA probe, Service Type, TOS value, Frequency (Polling Interval), and the VRF. You can view the conclusions of the threshold violations in the summary.

The **Threshold State** panel displays whether the threshold is configured for the selected probe or not. It also indicates whether the threshold is configured for a site or a probe. If a threshold is configured, you can view the summary of the threshold configuration details. The Threshold State pane enables you to check the configured values and the threshold violations, if any.

If the threshold is not configured, you can use the **Configure Threshold** link provided in this pane to configure the threshold.

The **Baseline State** panel displays whether Baseline Monitoring is configured for the selected probe or not. If baseline monitoring is configured, you can view the metric, baseline state, upper norm deviation, and lower norm deviation.

The **Latest Polled Values** panel displays the last five polled values for the relevant metrics, which may be RTT, two-way jitter, two-way packet loss, and MOS metric. You can also view the last polled time. If the last polled time is not available, it displays the message—`Polling Not Complete`.

The **Performance** panel enables you to analyze the performance faults for the selected probe, in the form of graphs. The graph shows the following information:

- RTT value of the selected probe
- Reachability of the selected probe

You can easily monitor and analyze the performance of the probe, from the color of the status. Whenever any problem arises, you can view the status in the **Performance** panel. The status of the probe enables you to easily determine the root cause of the fault.

The following table indicates the status information:

Probe Status	Status color indicating in the graph
Nominal	🟩 Normal
High, Low	🟧 Major
Critical	🟥 Critical
No status	🟨 No Status
Unavailable, Unknown	🟦 Unknown
Not Polled, Threshold not set, Not defined	⬜ Disabled

QA Probe Form

Displays the details for the selected QA probe and the configurations associated with it.

QA Probe Form: Left Panel

The left panel of the QA Probe form displays the following:

QA Probe Details

This section displays the following:

Basic Attributes: QA Probe Details

Attribute	Description
Status	Status of the QA probe. A QA probe can have any of the following status: • No Status • Normal • Disabled • Unknown • Warning • Major • Critical For more information on the status, see the topic Key Status Displayed in the QA Probes View
Name	Name of the selected QA probe For QA probes, the QA probe name is derived from the 'TAG' field of the QA probe definition. If the tag field is not present, then the QA probe name is derived by appending the source node name, the target IP address, and the admin index. For RFC QA probes, the name is derived from the RFC MIB. The QA probe names cannot be blank.
Owner	Name of the QA probe owner
Service	Type of the QA probe Possible service types are: • **UDP Echo** • **ICMP Echo** • **UDP** • **TCP Connect** • **VoIP**
Admin Index	The unique index ID given for each QA probe Available only for QA probes.
Manager	Specifies whether the NNMi management server is Local or specifies the name of the Regional Manager.

Source/Destination Info

This section displays the following:

Basic Attributes: Source/Destination Info

Attribute	Description
Source	Name of the starting device from which the QA probe is configured Click to display the source node information. The Node: <*Node Name*> form opens. Select the **QA Probes** tab to display the QA probes initiated from this node.
Source IP Address	IP address of the starting device from which the QA probe is configured
Source Interface	Interface name to which the QA probe is configured For information on configuring source interfaces, see Configuring Source Interface for a QA Probe.
Source Site	Name of site where the source device resides
Source Port	Port number of the starting device from which the QA probe is configured
Destination	Name of the end point on which the QA probe is configured
Destination IP Address	IP address of the device at the end point on which the QA probe is configured
Destination Site	Name of site where the destination device resides
Destination Port	Port number of the device at the end point on which the QA probe is configured
Measurement Precision	Whether the QA probe retrieves the network performance in microseconds or in milliseconds.
Timeout	Maximum time the source node will wait for a response from the destination node before stopping the request
Frequency	Frequency for the QA probe in seconds
TOS	Type of Service specified in an IP packet header that indicates the service level required for the packet
VRF	Virtual Routing and Forwarding (VRFs) tables defined on the source node. This field is populated only if the test is configured with VRF(s).
Discovery State	Discovered state of the source node Possible values are as follows: Completed - All the analysis are completed and the QA probes are discovered.

Attribute	Description
	In Progress- The discovery process is still gathering network information or the QA probe data.
Last Discovery Completed	Date, time, and time zone for the last discovery
Management Mode	Whether the source node is managed or not Possible states are as follows: • Managed: Indicates that the node is managed. • Not Managed: Indicates that the node is not managed on purpose. • Out of Service: Indicates that a node is unavailable because it is out of service.

Probes Form: Right Panel

The right panel of the QA Probes form displays information about the selected QA probe. The panel consists of the following tabs:

- State
- Threshold State
- Baseline State
- Jitter Configuration
- Status
- Conclusions
- Incidents
- Registration

Analysis Pane

The **Analysis** pane enables you to view the Summary, Threshold State, and Latest Polled Values panels.

The summary includes details such as the Status of the QA probe, Conclusions, Name of the QA probe, Service Type, TOS value, Frequency (Polling Interval), and the VRF. You can view the conclusions of the threshold violations in the summary.

The **Threshold State** panel displays whether the threshold is configured for the selected probe or not. It also indicates whether the threshold is configured for a site or a probe. If a threshold is configured, you can view the summary of the threshold configuration details. The Threshold State pane enables you to check the configured values and the threshold violations, if any.

If the threshold is not configured, you can use the **Configure Threshold** link provided in this pane to configure the threshold.

The **Latest Polled Values** panel displays the last five polled values for the relevant metrics, which may be RTT, two-way jitter, or two-way packet loss metric. If the last polled time is not available, it displays the message"Polling Not Complete".

QA Probes Form: State Tab

The **State** tab displays information about the last run of the QA probe.

Attributes: State Tab

Attribute	Description
Administrative State	Administrative State condition returned by the QA probe The QA probe status is derived from the SNMP polling results for Administrative State, as well as from any conclusions.
Operational State	Operational State condition returned by the QA probe The QA probe status is derived from the SNMP polling results for Operational State, as well as from any conclusions.
State Last Modified	The date, time, and time zone when the QA probe state was last modified.

QA Probes Form: Threshold State Tab

The **Threshold State** tab displays a quick summary of the most recent performance of the **network element**[1] on which the QA probe runs.

This tab displays only those metrics on which the administrator configured a threshold.

When the network performance breaches a threshold depending on the count based, or time based threshold configuration, the **Status** tab displays the network element status as ▽ Major and the Incident tab displays a ⊗ Critical incident raised on the network element.

You can view the following details:

Field Name	Description
State	The threshold state of the probe. The valid threshold states are listed below:

[1] Some examples of network elements are routers, switches, and phone connections

Field Name	Description
	High Nominal Low Not Polled Unavailable Threshold Not Set None See the topic Threshold States to get more information
Metric Name	The name of the metric.
Type	The type of threshold configured can be Count Based or Time Based.
Value	This value indicates the high threshold value.
Rearm Value	The Rearm Value is used to indicate the end of the threshold state and NNM iSPI Performance for QA clears the incident once it reaches below this value.
Trigger Count	Indicates after how many consecutive threshold violations NNM iSPI Performance for QA alerts the operator by transitioning the threshold state to High. This field value appears for Count based threshold configuration.
Duration	Indicates the minimum duration for which the value must persist in a high value range for the threshold state to change to High. This field value appears for Time based threshold configuration.
Duration Window	Indicates the duration of the window within which the high duration criteria must be met. This field value appears for Time based threshold violations.
Generate Incident	Indicates if NNM iSPI Performance for QA must generate an incident for count based or time based threshold configured.

Threshold States

The following table describes these performance states or threshold states:

Threshold States

State	Description
High	*For Count-Based Threshold Configuration:*

State	Description
	Indicates that the measured value of the metric is above the configured High Value and recurs for the consecutive number of times specified in the Trigger Count *For Time-Based Threshold Configuration:* Indicates that the measured value of the metric is above the configured High Value and this high value persists for the specified High Duration within the High Duration Window
Nominal	Indicates that the measured value of the metric is within the normal healthy range
Low	*For Count-Based Threshold Configuration*: Indicates that the measured value of the metric is below the configured Low Value for the consecutive number of times specified in the Trigger Count *For Time-Based Threshold Configuration:* Indicates that the measured value of the metric is below the configured Low Value and this low value persists for the specified Low Duration within the Low Duration Window. Typically, this threshold state is applicable for metrics like Mean Opinion Score (MOS).
Not Polled	Indicates that the metric is intentionally not polled. Some of the possible reasons are: • Performance Monitoring is notMean Opinion Score (MOS) enabled, because of current Communication Configuration settings in NNMi • The parent Node or Interface is set to Not Managed or Out of Service.
Unavailable	Unable to compute the metric or the computed value is outside the valid range
Threshold Not Set	Indicates that the threshold is not set for the metric
None	*For Count-Based Threshold Configuration:* Indicates that the measured value of the metric is zero, and recurs for the consecutive number of times specified in the Trigger Count *For Time-Based Threshold Configuration:* Indicates that the measured value of the metric is zero and this zero value persists for the specified duration within the High or Low Duration Window (depending on the metric).

- Click **Open** to view more information about a specific threshold state.
- Click **Refresh** to refresh the Threshold State table.

- Click **Show View in New Window** to open the Threshold State table in an independent window.

QA Probes Form: Baseline State Tab

The **Baseline State** tab displays only those metrics on which the administrator configured a baseline deviation setting

The valid baseline states for the QA probes are listed below:

- Normal Range - The metric is within the normal range of deviation
- Abnormal Range - The metric is either above or below the configured normal range of the deviation
- Unavailable -The computed value for the metric is not found in HP NNM iSPI Performance for Metrics Software
- Unset - No baseline is computed
- Not polled - The metric is not polled for baseline deviations
- No Policy - No polling policy exists for this metric
- Threshold Agent Error - Indicates an error was returned while retrieving the data from NPS by the state poller

QA Probes Form: Jitter Configuration Tab

The **Jitter Configuration** tab displays information about the **delay**[1] variance for a data packet to reach the destination **network element**[2].

Attributes: Jitter Configuration Tab

Attribute	Description
Inter Packet Interval	Time delay between successive data packets sent in a single QA probe. Displayed in microseconds.
Number of Packets	Number of data packets sent by a single QA probe.

[1] The time taken for a packet to travel from the sender network element to the receiver network element.
[2] Some examples of network elements are routers, switches, and phone connections

QA Probes Form: Status Tab

The **Status** tab displays a quick summary of the iSPI object status to better determine and monitor any significant patterns in behavior and activity.

Attribute: Status Tab

Attribute	Description
Status	Overall status for the current QA probe Possible values are as follows: • No Status • Normal • Disabled • Unknown • Warning • Major • Critical For more information on the QA probe status, see the topic QA Probe Status In the case of sub-minute polling, the QA probe status refreshes every 2 minutes. The QA probe status gets updated based on the average polling value obtained for the last 2 minutes. See the following topics for information about how the current status was determined: • QA Probes Form: State Tab • QA Probes Form: Conclusions Tab
Status Last Modified	Current status is calculated and set by Causal Engine. The Time Stamp data displays the time when the status of the QA probe is last updated.
Status History	List of up to the last 30 changes in status for the selected QA probe. This view is useful for obtaining a summary of the QA probe status so that you can better determine any patterns in traffic between the source node or site and the destination node or site. • Click **Refresh** to refresh the Status History table. • Click **Show View in New Window** to open the Status History table in an independent window.

QA Probes Form: Conclusions Tab

The **Conclusions** tab displays the results of the overall derived status. You can get a quick summary of the status and problem description retrieved by the selected QA probe.

Attribute: Conclusions Tab

Attribute	Description
Status	Status of the conclusion Possible values are as follows: - ⊘ No Status - ✓ Normal - ▨ Disabled - ? Unknown - ▲ Warning - ▼ Major - ✖ Critical For more information on the QA probe status, see the topic QA Probe Status Status reflects the most serious outstanding conclusion.
Time Stamp	Current status is calculated and set by Causal Engine. The Time Stamp data displays the time when the status of the QA probe is last updated.
Conclusions	Dynamically generated list of summary statuses of the QA probe at points in time that contributed to the current overall status of the selected QA probe. Status is set by the Causal Engine. This view is useful for obtaining a quick summary of the status and problem description for the QA probe's most current status. Examples of conclusions that might appear together are listed below: - TestUp[1] - RttThresholdStateHigh - TwoWayPktLossThresholdStateHigh The following examples list some of the conclusions and the causing Administrative and Operational states:

[1] When both Administrative and Operational states are up.

Attribute	Description
	Conclusions caused by Administrative State TestTransient • notready • createandwait • createandgo • destroy TestDisabled • disabled • Notinservice TestUnknown Caused by an SNMP error. TestUnpolled Caused when the QA probe is not polled. **Conclusions caused by Operational State** TestFailed • OperStateTimeout on probe • OperStateDisconnected on probe • OperStateNotConnected on probe • OperStateApplicationSpecific on probe • OperStateDnsServerTimeout on probe • OperStateTcpConnectTimeout on probe • OperStateHttpTransactionTimeout on probe • OperStateDnsQueryError on probe • OperStateHttpError on probe • OperStateError on probe • OperStateDisabled on probe

Attribute	Description
	TestError OperStateOther on probe OperStateSequenceError on probe OperStateOverThreashold on probe OperStateBusy on probe OperStateVerifyError on probe OperStateDropped on probe See QA Probes Form: State Tab for information about how the conclusions are based on the QA probe states.

QA Probes Form: Incidents Tab

The **Incidents** tab displays a quick summary of the problem description retrieved by the QA probe.

You can view the incidents only if you have the permissions to access the source node.

Attribute: Incidents Tab

Attribute	Description
Incidents Attributes	The attributes listed in the incidents tab are same as available in the NNMi Incidents form. For more information for the attributes, see the topic *NNMi Incidents Form* in the *Network Node Manager i SoftwareOnline help* HP Network Node Manager iSPI Performance for Quality Assurance Software generates the following incidents: TwoWayJitterHigh Indicates high two way jitter. This value is the average of the following values: • Positive jitter from the source to the destination • Negative jitter from the source to the destination • Positive jitter from the destination to the source • Negative jitter from the destination to the source
	SourceToDestinationPositiveJitterHigh Indicates high positive jitter from the source to the destination, based on the reported value on the MIB. The exact MIB values that are queried vary based on whether the latest value is polled or cumulative value is polled.
	DestinationToSourcePositiveJitterHigh Indicates high positive jitter from the destination to the source, based on the reported value on the MIB. The exact MIB values that are queried vary based on whether the latest value is polled or cumulative value is polled.

Attribute	Description
	SourceToDestinationNegativeJitterHigh Indicates high negative jitter from the source to the destination, based on the reported values on the MIB. The exact MIB values that are queried vary based on whether the latest value is polled or cumulative value is polled.
	DestinationToSourceNegativeJitterHigh Indicates high negative jitter from the destination to the source, based on the reported values on the MIB. The exact MIB values that are queried vary based on the whether the latest value is polled or cumulative value is polled.
	TwoWayPacketLossHigh Indicates high percentage of two way packet loss. This value is the average of the following values: • Packet loss percentage from the source to the destination • Packet loss percentage from the destination to source
	SourceToDestinationPacketLossHigh Indicates high percentage of packet loss from the source to the destination. The packet loss percentage is calculated based on the total number of packets sent and the reported number of packets lost. The exact MIB values that are queried vary based on whether the latest value is polled or cumulative value is polled.
	DestinationToSourcePacketLossHigh Indicates high percentage of packet loss from the destination to the source. The packet loss percentage is calculated based on the total number of packets sent and the reported number of packets lost. The exact MIB values that are queried vary based on whether the latest value is polled or cumulative value is polled.
	RoundTripTimeHigh Indicates high round trip time, based on the reported value on the MIB. The exact MIB values that are queried vary based on whether the latest value is polled or cumulative value is polled.
	MeanOpinionScoreLow Indicates low mean opinion score, based on the reported value on the MIB. The exact MIB values that are queried vary based on whether the latest value is polled or cumulative value is polled.
	RoundTripTimeAbnormal Indicates round trip time is of Abnormal range. This implies the RTT is above the configured normal range of the deviation.

Attribute	Description
	TwoWayPacketLossAbnormal Indicates two way packet loss is of Abnormal range. This implies the two way packet loss is above the configured normal range of the deviation. This value is the average of the following values: • Packet loss percentage from the source to the destination • Packet loss percentage from the destination to source
	TwoWayJitterAbnormal Indicates two way jitter is of Abnormal range. This implies the two way jitter is above the configured normal range of the deviation. This value is the average of the following values: • Positive jitter from the source to the destination • Negative jitter from the source to the destination • Positive jitter from the destination to the source • Negative jitter from the destination to the source
	MeanOpinionScoreAbnormal Indicates Mean Opinion Score is of Abnormal range. This implies the mean opinion score is either above or below the configured normal range of the deviation.
	TestError This incident indicates that the QA Probe has returned an error.
	TestTransient This incident indicates that the QA Probe is in transient state.
	TestFailed This incident indicates that the QA Probe has failed to run.
	TestDisabled This incident indicates that the QA Probe is explicitly disabled by the device administrator.

QA Probes Form: Registration Tab

The **Registration** tab displays the results of the overall derived status from the database.

Registration

Attribute	Description
Created	The last date and time that any of the QA probes user interface attributes were created.
Last Modified	The last date and time that any of the QA Probe user interface attributes were modified.

Object Identifiers

Attribute	Description
ID	The Unique Object Identifier that is unique across the entire NNMi database.
UUID	The Universally Unique Object Identifier that is unique across all databases.

Accessing the Critical QA Probes Inventory View

The Critical Probes view is used to segregate and display only the QA probes whose status is critical. The critical QA probes view displays the operational state, and administrative state as well. These details and the Conclusions tab details of the QA probe enable you to drill-down to the root cause of the problem.

To launch the Critical Probes view:

1. Log on to NNMi console using your username and password.
2. Click **Quality Assurance** in the Workspaces panel. The Quality Assurance tab expands.
3. Click **Critical Probes** to display the QA probes of Critical status that are discovered in your network.

The NNM iSPI Performance for QA supports Multi-Tenancy architecture configured in NNMi. The security group defined for a node in NNMi is also applicable for the critical probes of the node in NNM iSPI Performance for QA. This implies that all the critical QA probes cannot be viewed by all users. For example, if a user has access to a set of nodes, the user can view only the critical QA probes configured on those nodes.

Key Attributes of the Critical Probes View

The Critical Probes view displays the following key attributes for each Critical QA probe for a specific time interval.

The default time interval to refresh is 300 seconds, or 5 minutes.

Attribute Name	Description
Operational State	Operational State condition returned by the critical QA probe The QA probe status is derived from the SNMP polling results for Operational State, as well as from any conclusion.
Administrative State	Administrative State condition returned by the QA probe The QA probe status is derived from the SNMP polling results for Administrative State, as well as from any conclusion.

Attribute Name	Description
Name	The name of the discovered QA probe configured in the network device.
Owner	The name of the discovered QA probe's owner.
Service	The type of the discovered QA probe.
Source	The source device from which the data packet is sent.
Destination	The network device to which the data packet is sent.
Source **Site**[1]	The network site from which the data packet is sent.
Destination Site	The network site to which the data packet is sent.
Manager	Specifies whether the NNMi management server is Local or specifies the name of the Regional Manager.
Source Tenant	Specifies the NNMi tenant selected for the source network device

Note: If you launch the Status Poll command from NNMi, it triggers a corresponding status poll for NNM iSPI Performance for QA as well.

Analysis Pane

Select the QA probe by clicking on the QA probe in the Critical QA Probes View to view the Analysis pane. The Analysis pane of the selected Critical QA Probe appears below.

In the **Analysis** pane, you can view the summary, Threshold State, and Baseline State panels.

The summary includes details such as the Status of the QA probe, Conclusions, Name of the QA probe, Service Type, TOS value, Frequency (Polling Interval), and the VRF. You can view the conclusions of the threshold violations in the summary.

The **Threshold State** panel displays whether the threshold is configured for the selected probe or not. If a threshold is configured, you can view the summary of the threshold configuration details, and you can also view whether the threshold is configured based on site or a probe. The Threshold State pane enables you to check the configured values and the threshold violations, if any.

The **Baseline State** panel displays whether Baseline Monitoring is configured for the selected probe or not. If baseline monitoring is configured, you can view the metric, baseline state, upper norm deviation, and lower norm deviation.

[1] A logical organization of networking devices. In the scope of enterprise networks, a site can be a logical grouping of networking devices generally situated in similar geographic location. The location can include a floor, building or an entire branch office or several branch offices which connect to head quarters or another branch office via WAN/MAN. Each site is uniquely identified by its name. In case of the service provider networks the Virtual Routing and Forwarding (VRF) on a Provider Edge (PE) router or a Customer Edge (CE) routers can be defined as a site.

Accessing the Threshold Exceptions Probes Inventory View

Threshold Exceptions Probes view displays a set of probes, which has violated the threshold for any one or more of the metrics of NNM iSPI Performance for QA. You can view the threshold states for all the metrics so that the user can quickly identify which metrics have breached the threshold level.

The QA Probes view just gives an overview of the violation of the threshold state for the metrics such as Jitter, RTT and so on. However, the Threshold Exceptions Probes view is very exhaustive, and displays the intricate details of violation of the threshold states such as Positive Jitter or Negative Jitter, and so on. This view is very useful to segregate the QA probes that have violated the threshold state and arrive at a conclusion.

To launch the Threshold Exceptions Probes view:

1. Log on to NNMi console using your username and password.
2. Click **Quality Assurance** in the Workspaces panel. The Quality Assurance tab expands
3. Click **Threshold Exceptions Probes** to view the QA probes that has violated the threshold for Jitter, RTT, Packet Loss and Mean Opinion Score metrics.

The NNM iSPI Performance for QA supports Multi-Tenancy architecture configured in NNMi. The security group defined for a node in NNMi is also applicable for the probes of the node in NNM iSPI Performance for QA. This implies that all threshold violated QA probes cannot be viewed by all users. For example, if a user has access to a set of nodes, the user can view only the threshold violated QA probes configured on those nodes.

Each QA probe displays information for a specific time interval.

The default time interval to refresh is 300 seconds, or 5 minutes. You can generate reports in the Network Performance Server for the threshold violated probes.

Key Attributes of the Threshold Exceptions Probes View

Attribute Name	Description
Status	NNM iSPI Performance for QA calculates the status based on the polling status of the nodes and the threshold states. Displays the QA probes of the following status: • ▲ Warning • ▼ Major • ✖ Critical For more information on status, see the topic QA Probe Status
Name	The name of the discovered QA probe configured in the network device.

Attribute Name	Description
Service	The type of the discovered QA probe.
Manager	Specifies whether the NNMi management server is Local or specifies the name of the Regional Manager.
RTT	The round-trip time used by the selected QA probe. Displays any one of the following threshold states for the metric High Nominal Low Not Polled Unavailable Threshold Not Set None
Jitter	The **delay**[1] variance for a data packet to reach the destination device or site. Displays any one of the following threshold states for the metric High Nominal Low Not Polled Unavailable Threshold Not Set None
+ve Jitter SD	Indicates the threshold state of the positive jitter from the source to the destination Displays any one of the following threshold states for the metric High Nominal Low

[1] The time taken for a packet to travel from the sender network element to the receiver network element.

Attribute Name	Description
	Not Polled Unavailable Threshold Not Set None
+ve Jitter DS	Indicates the threshold state of the positive jitter from the destination to the source Displays any one of the following threshold states for the metric High Nominal Low Not Polled Unavailable Threshold Not Set None
-ve Jitter SD	Indicates the threshold state of the negative jitter from the source to the destination Displays any one of the following threshold states for the metric High Nominal Low Not Polled Unavailable Threshold Not Set None
-ve Jitter DS	Indicates the threshold state of the negative jitter from the destination to the source Displays any one of the following threshold states for the metric High Nominal Low

Attribute Name	Description
	Not Polled Unavailable Threshold Not Set None
PL (Packet Loss)	The percentage of packets that failed to arrive at the destination. Displays any one of the following threshold states for the metric High Nominal Low Not Polled Unavailable Threshold Not Set None
Packet Loss SD	Indicates the the threshold state of the percentage of packet loss from the source to the destination. Displays any one of the following threshold states for the metric High Nominal Low Not Polled Unavailable Threshold Not Set None

Attribute Name	Description
Packet Loss DS	Indicates the threshold state of the percentage of packet loss from the destination to source. Displays any one of the following threshold states for the metric High Nominal Low Not Polled ? Unavailable Threshold Not Set
MOS	Indicates the threshold state of the **Mean Opinion Score (MOS)** of the jitter.
Source Tenant	Specifies the NNMi tenant selected for the source network device

The following table describes the network performance state or the threshold state values:

Threshold States

State	Description
High	*For Count-Based Threshold Configuration:* Indicates that the measured value of the metric is above the configured High Value and recurs for the consecutive number of times specified in the Trigger Count *For Time-Based Threshold Configuration:* Indicates that the measured value of the metric is above the configured High Value and this high value persists for the specified High Duration within the High Duration Window
Nominal	Indicates that the measured value of the metric is within the normal healthy range
Low	*For Count-Based Threshold Configuration*: Indicates that the measured value of the metric is below the configured Low Value for the consecutive number of times specified in the Trigger Count *For Time-Based Threshold Configuration:* Indicates that the measured value of the metric is below the configured Low Value and this low value persists for the specified Low Duration within the Low Duration Window. Typically, this threshold state is applicable for metrics like Mean Opinion Score (MOS).
Not	Indicates that the metric is intentionally not polled.

State	Description
Polled	Some of the possible reasons are: - Performance Monitoring is notMean Opinion Score (MOS) enabled, because of current Communication Configuration settings in NNMi - The parent Node or Interface is set to Not Managed or Out of Service.
? Unavailable	Unable to compute the metric or the computed value is outside the valid range
? Threshold Not Set	Indicates that the threshold is not set for the metric
None	*For Count-Based Threshold Configuration:* Indicates that the measured value of the metric is zero, and recurs for the consecutive number of times specified in the Trigger Count *For Time-Based Threshold Configuration:* Indicates that the measured value of the metric is zero and this zero value persists for the specified duration within the High or Low Duration Window (depending on the metric).

> **Note:** If you launch the Status Poll command from NNMi, it triggers a corresponding status poll for NNM iSPI Performance for QA as well.

Analysis Pane

Select the QA probe by clicking on the QA probe in the Threshold Exceptions Probes View to view the Analysis pane. The Analysis pane of the selected QA Probe appears below.

In the **Analysis** pane, you can view the summary, Threshold State, Baseline State, and Latest Polled Values panels.

The summary includes details such as the Status of the QA probe, Conclusions, Name of the QA probe, Service Type, TOS value, Frequency (Polling Interval), and the VRF. You can view the conclusions of the threshold violations in the summary.

The **Threshold State** panel displays the summary of the threshold violations.It also displays whether the threshold configuration is based on probe or site.

The **Baseline State** panel displays whether Baseline Monitoring is configured for the selected probe or not. If baseline monitoring is configured, you can view the metric, baseline state, upper norm deviation, and lower norm deviation.

The **Latest Polled Values** panel displays the last five polled values for the relevant metrics, which may be RTT, two-way jitter, two-way packet loss, and MOS metric. You can also view the last polled time. If the last polled time is not available, it displays the message — `Polling Not Complete.`

Accessing the Baseline Exceptions Probes Inventory View

Baseline Exceptions Probes view displays the QA probes with the baseline state as Abnormal Range, Unavailable, No Policy, or Not Polled for any one or more of the following metrics:

- RTT
- Two Way Jitter
- Two Way Packet Loss
- MOS

For more information, see the topic Baseline Monitoring

This view is very useful to segregate the Baseline exceptions QA probes and arrive at a conclusion.

To launch the Baseline Exceptions Probes view:

1. Log on to NNMi console using your username and password.
2. Click **Quality Assurance** in the Workspaces panel. The Quality Assurance tab expands
3. Click **Baseline Exceptions Probes** to view the QA probes with the baseline state as Abnormal Range, Unavailable, or Not Polled for any one or more of the metrics.

The NNM iSPI Performance for QA supports Multi-Tenancy architecture configured in NNMi. This implies that all baseline exception QA probes cannot be viewed by all users. For example, if a user has access to a set of source nodes, the user can view only the QA probes configured on those source nodes.

Each QA probe displays information for a specific time interval.

The default refresh time interval is 300 seconds, or 5 minutes.You can generate reports in the Network Performance Server for the probes with baseline exceptions.

Key Attributes of the Baseline Exceptions Probes View

Attribute Name	Description
Status	NNM iSPI Performance for QA calculates the status based on the polling status of the nodes and the threshold states. Displays the QA probes of the following status: • Normal • Warning • Major • Critical • Unknown • Disabled • Not Polled • No Status

Attribute Name	Description
	For more information on status, see the topic QA Probe Status
Name	The name of the discovered QA probe configured in the network device.
Service	The type of the discovered QA probe.
Manager	Specifies whether the NNMi management server is Local or specifies the name of the Regional Manager.
RTT	The round-trip time used by the selected QA probe. Displays any one of the following baseline states for the metric: • Normal Range - The metric is within the normal range of deviation • Abnormal Range - The metric is above the configured normal range of the deviation • Unavailable - The computed value for the metric is not found in HP NNM iSPI Performance for Metrics Software • Unset - No baseline is computed • Not polled - The metric is not polled for baseline deviations • No Policy - No polling policy exists for this metric
Two Way Jitter	Indicates two way jitter. This value is the average of the following values: • Positive jitter from the source to the destination • Negative jitter from the source to the destination • Positive jitter from the destination to the source • Negative jitter from the destination to the source Displays any one of the following baseline states for the metric: • Normal Range - The metric is within the normal range of deviation • Abnormal Range - The metric is either above or below the configured normal range of the deviation • Unavailable - The computed value for the metric is not found in HP NNM iSPI Performance for Metrics Software • Unset - No baseline is computed • Not polled - The metric is not polled for baseline deviations • No Policy - No polling policy exists for this metric
Two Way Packet Loss	The percentage of packets that failed to arrive from the source to destination and destination to source.

Attribute Name	Description
	Displays any one of the following baseline states for the metric: - Normal Range - The metric is within the normal range of deviation - Abnormal Range - The metric is either above or below the configured normal range of the deviation - Unavailable - The computed value for the metric is not found in HP NNM iSPI Performance for Metrics Software - Unset - No baseline is computed - Not polled - The metric is not polled for baseline deviations - No Policy - No polling policy exists for this metric
MOS	Indicates the baseline state of the **Mean Opinion Score (MOS)** of the jitter. Displays any one of the following baseline states for the metric: - Normal Range - The metric is within the normal range of deviation - Abnormal Range - The metric is either above or below the configured normal range of the deviation - Unavailable - The computed value for the metric is not found in HP NNM iSPI Performance for Metrics Software - Unset - No baseline is computed - Not polled - The metric is not polled for baseline deviations - No Policy - No polling policy exists for this metric
Source Tenant	Specifies the NNMi tenant selected for the source network device

The default polling interval for the HP NNM iSPI Performance for Metrics Software data to detect the exception is 2 minutes.

Analysis Pane

Select the QA probe by clicking on the QA probe in the Baseline Exceptions Probes view. The Analysis pane of the selected QA Probe appears below. The **Baseline State** panel displays the metric, baseline state, upper norm deviation, and lower norm deviation.

Viewing and Saving the QA Probes associated with QA Groups Using Command Line Utilities

To display and save the QA probes associated with a QA group, use the following commands:

QA Group Type	QA Group Command	Command Behavior
Display the QA Probes associated with a QA Group		
QA Probes		Displays the QA probes associated with the QA group
UNIX	*$NnmInstallDir/bin/nmsqacustomgrouputil.ovpl -u <username> -p <password> -display -gt QAProbes -g <QA group name>*	
Windows	*%NnmInstallDir%\bin\nmsqacustomgrouputil.ovpl -u <username> -p <password> -display -gt QAProbes -g <QA group name>*	
CBQoS		
UNIX	*$NnmInstallDir/bin/nmsqacustomgrouputil.ovpl -u <username> -p <password> -display -gt CBQOS -g <QA group name> -<interface or action for which the QA probe is configured>*	
Windows	*%NnmInstallDir%\bin\nmsqacustomgrouputil.ovpl -u <username> -p <password> -display -gt CBQOS -g <QA group name> -<interface or action for which the QA probe is configured>*	
Save the QA Probes For the QA Group		
QA Probes		Saves the QA Probes associated with the selected QA Group in a file. Provide absolute path for the file where you want to save the QA probes associated with the selected QA group.
UNIX	*$NnmInstallDir/bin/nmsqacustomgrouputil.ovpl -u <username> -p <password> -gt qaprobes -g <QA group name> -savetofile <filename>*	
Windows	*%NnmInstallDir%\bin\nmsqacustomgrouputil.ovpl -u <username> -p <password> -gt qaprobes -g <QA group name> -savetofile <filename>*	
CBQoS		
UNIX	*$NnmInstallDir/bin/nmsqacustomgrouputil.ovpl -u <username> -p <password> -gt CBQOS -g <custom group name> -<interface/action> -savetofile <filename>*	
Windows	*%NnmInstallDir%\bin\nmsqacustomgrouputil.ovpl -u <username> -p <password> -gt CBQOS -g <custom group name> -<interface/action> -savetofile <filename>*	

Viewing Source Interface for a QA Probe

HP Network Node Manager iSPI Performance for Quality Assurance Software enables you to view source interfaces to the QA probes and analyze the traffic flows passing through the interface.

The NNM iSPI Performance for QA maps the interface only if the HP Network Node Manager i Software discovered the interface and the interface information is available in the NNMi database. If the source IP is management IP, the NNM iSPI Performance for QA does not display the interface.

Using this feature, you can:

- Monitor the interface health for a specific time range.
- Monitor the traffic flow through the specified source interface for a specific time range.
- Launch the NNMi Interface form and view the interface details.

Follow any of these techniques to configure the source interface to a QA probe:

- For QA probes, specify the source IP address to the QA probe.
- For RFC 4560 QA probes or Juniper RPM QA probes, specify the source interface index when configuring the QA probes.
- You can also use the Probe Configuration form. For more information,see Configure Probes

The NNM iSPI Performance for QA maps the source IP address or the interface index configured for the QA probe to the interface in NNMi.

To launch the interface and traffic flow related reports for the source interface:

1. Click ▣ next to the Source Interface in the QA Probes form.
2. Select **Open**.

   The Interface form opens.
3. Select **Actions** and **Reporting - Report Menu** to display the reports related to the interface.

Consider this use case, the Jitter or VoIP QA probe is configured on the edge router; the edge router is a multi homed with different ISPs. So the selected metrics makes more sense when the right interface for sending traffic is picked. So the customer would configure the QA probe with specific interface. In this case the interface is stored in the DB and also dumped to HP NNM iSPI Performance for Metrics Software for reporting.

Assume that there is a threshold violation and the customer wants to see all the Top N talkers , scoped by the interface. This is achieved because the interface is stored in NPS and all reports is scoped by interface.

Customer can pick all the ‘conversations’ between this source and destination to find the root cause.

QA Probe Status

The system displays any one of the following valid QA probe status while polling:

Status	Description for Operators	Description for Administrators
✓ Normal	The source node is Ok or Enabled	The source node or site is Active or Enabled

Status	Description for Operators	Description for Administrators
▲ Warning	The source node has returned any of the following status: • Other • Disconnected • Over the threshold value • Busy • Not Connected • Dropped	The source node or site is Active or Enabled
▼ Major	Indicates the metric in QA probe breaches the threshold level.	Indicates the metric in QA probe breaches the threshold level.
✖ Critical	The source node has returned any of the following errors: • Timed out error • Sequence error • Verify error • Application specific error • DNS server timeout error • TCP connect timeout error • HTTP transaction timeout error • DNS query error • HTTP error • State error • Source node or site disabled	The source node or site has returned any of the following status: • Not ready • Create and go • Create and wait • Destroy
? Unknown	The source node has returned any of the following errors: • SNMP error • If there is no polling policy	The source node or site is Active or Enabled
▨ Disabled	The source node is disabled	The source node or site has returned any of the following status: • Not in service • Disabled

Status	Description for Operators	Description for Administrators
Not Polled	When the user selected not to poll the source node	When the user selects not to poll the source node
No Status	• When the node is not managed – Indicates the node is intentionally not managed. For example, certain nodes may not be managed during scheduled network maintenance cycles. HP Network Node Manager i Software does not update discovery information or monitor these nodes. • When the node is out of service – Indicates a node is unavailable because it is out of service. NNMi does not update discovery information or monitor these nodes. This attribute is useful for notifying NNMi when a device has been temporarily out of service, or should never be managed.	• When the node is not managed – Indicates the node is intentionally not managed. For example, certain nodes may not be managed during scheduled network maintenance cycles. NNMi does not update discovery information or monitor these nodes. • When the node is out of service – Indicates a node is unavailable because it is out of service. NNMi does not update discovery information or monitor these nodes. This attribute is useful for notifying NNMi when a device has been temporarily out of service, or should never be managed.

NNM iSPI Performance for QA Baseline Incidents

The following table lists the NNM iSPI Performance for QA baseline incidents:

Incident Name	Severity	Interpretation
• DestinationToSourceNegativeJitterAbnormal • SourceToDestinationNegativeJitterAbnormal	Critical	Measured value for negative jitter is abnormal during the baseline monitoring time
• DestinationToSourcePositiveJitterAbnormal • SourceToDestinationPositiveJitterAbnormal	Critical	Measured value for positive jitter is abnormal during the baseline monitoring time
TwoWayJitterAbnormal	Critical	Measured value for two way jitter is abnormal during the baseline monitoring time
• DestinationToSourcePacketLossAbnormal • SourceToDestinationPacketLossAbnormal	Critical	Measured value for packet loss percentage is abnormal during the baseline monitoring time
TwoWayPacketLossAbnormal	Critical	Measured value for packet loss percentage is abnormal during the baseline monitoring time

MeanOpinionScoreAbnormal	Critical	Measured value for Mean Opinion Score (MOS) is abnormal during the baseline monitoring time
RoundTripTimeAbnormal	Critical	Measured value for round trip time is abnormal during the baseline monitoring time
	Critical	Measured value for negative jitter is abnormal during the baseline monitoring time
	Critical	Measured value for packet loss percentage is abnormal during the baseline monitoring time

NNM iSPI Performance for QA Threshold Incidents

The following table lists the incidents raised for NNM iSPI Performance for QA threshold violations:

Incident Name	Severity	Interpretation
• DestinationToSourceNegativeJitterHigh • SourceToDestinationNegativeJitterHigh	Critical	Measured value for negative jitter is higher than the upper bound of configured threshold value
• DestinationToSourcePositiveJitterHigh • SourceToDestinationPositiveJitterHigh	Critical	Measured value for positive jitter is higher than the upper bound of configured threshold value
TwoWayJitterHigh	Critical	Measured value for two way jitter is higher than the upper bound of configured threshold value
• DestinationToSourcePacketLossHigh • SourceToDestinationPacketLossHigh	Critical	Measured value for packet loss percetage is higher than the upper bound of configured threshold value
TwoWayPacketLossHigh	Critical	Measured value for packet loss percetage is higher than the upper bound of configured threshold value
MeanOpinionScoreLow	Critical	Measured value for Mean Opinion Score (MOS) is less than the lower bound of configured threshold value
RoundTripTimeHigh	Critical	Measured value for round trip time is higher than the upper bound of configured threshold value

TestDisabled	Critical	Selected QA probe is in Disabled state
TestError	Warning	Selected QA probe returned an error
TestFalied	Critical	Selected QA probe failed to run
TestTransient	Critical	Selected QA probe is in transient state

Administrative State

The following table describes the different Administrative State for QA probes:

QA Probe State Attributes	Description
rttMonCtrlAdminStatus	The status of the conceptual RTT control row. The current Administrative State contributes towards the status calculation for this QA probe. Possible values are: • active[1] • notInService[1] • notReady[1] • createAndGo[1] • createAndWait[1] • destroy[1]

[1] Indicates that the conceptual row is available for use by the managed device

[1] Indicates that the conceptual row exists in the agent, but is unavailable for use by the managed device.

[1] Indicates that the conceptual row exists in the agent, but is missing information necessary in order to be available for use by the managed device.

[1] Supplied by a management station wishing to create a new instance of a conceptual row and to have its status automatically set to active, making it available for use by the managed device.

[1] Supplied by a management station wishing to create a new instance of a conceptual row (but not make it available for use by the managed device).

[1] Supplied by a management station wishing to delete all of the instances associated with an existing conceptual row.

RFC QA Probe or Juniper RPM QA Probe State Attributes	Description
pingCtlAdminStatus	For RFC the following values are supported for the Administrative State: • Enabled[1] • Disabled [1]

Operational State

The following table describes the different Operational State for QA probes:

QA Probe State Attributes	Description
• rttMonLatestJitterOperSense • rttMonLatestRttOperSense	The rttMonLatestJitterOperSense status defines an application specific sense cod the completion status of the latest Jitter RTT operation. The rttMonLatestRttOperSense status defines an application sense code for the completion status of the latest RTT operation. The current Operational State contributes towards the status calculation for this QA probe.

[1] Attempt to activate the QA probe.
[1] Deactivate the QA probe.

QA Probe State Attributes	Description
	Possible values are: - other(0)[1] - ok(1)[1] - disconnected(2)[1] - overThreshold(3)[1] - timeout(4)[1] - busy(5)[1] - notConnected(6)[1] - dropped(7)[1] - sequenceError(8)[1]

[1] The operation is not started or completed or this object is not applicable for the probe type.
[1] A valid completion occurred and timed successfully.
[1] The operation did not occur because the connection to the target was lost.
[1] A valid completion was received but the completion time exceeded a threshold value.
[1] An operation timed out; no completion time recorded.
[1] The operation did not occur because a previous operation is still outstanding.
[1] The operation did not occur because no connection (session) exists with the target.
[1] The operation did not occur due to lack of internal resource.
[1] A completed operation did not contain the correct sequence id; no completion time recorded.

QA Probe State Attributes	Description
	• verifyError(9)[1] • applicationSpecific(10)[1] • dnsServerTimeout(11)[1] • tcpConnectTimeout(12)[1] • httpTransactionTimeout(13)[1] • dnsQueryError(14)[1] • httpError(15)[1] • error(16)[1]

RFC QA Probe or Juniper RPM QA Probe State Attributes	Description
pingResultsOperStatus	For RFC the following values are supported for the Operational State: • Enabled[9]

[1] A completed operation was received, but the data it contained did not match the expected data; no completion time recorded.

[1] The application generating the operation had a specific error.

[1] DNS Server Timeout

[1] TCP Connect Timeout

[1] HTTP Transaction Timeout

[1] DNS Query error (because of unknown address etc.)

[1] HTTP Response StatusCode is not OK (200) then HTTP error is set.

[1] If there are socket failures or some other errors not relevant to the actual probe, they are recorded under this error.

[9] QA probe is active.

RFC QA Probe or Juniper RPM QA Probe State Attributes	Description
	- Disabled [1]

HP Network Node Manager iSPI Performance for Quality Assurance Software Real Time Line Graph

The Real Time Line graph enables you to do the following tasks :

- View the graph based on the real-time data of the metrics
- View the graph for QA probes configured on a node
- View the graph for selected QA probes
- View the trend of the selected metric value, and analyze the performance based on the metric values at polling intervals

The NNM iSPI Performance for QA supports Multi-Tenancy architecture configured in NNMi. A user can view the Real Time Line graph only if the source node or QA probe can be accessed by the user.

You can view a toolbar in the Real Time Line graph. See *Using Line Graphs* topic in the *HP Network Node Manager i Software Online Help* for information on the toolbar.

Launching the Real Time Line Graph

Perform the following steps to launch the Real Time Line graph:

1. Log on to NNMi console using your username and password.
2. You can either launch the graph for the QA probes configured on the node, or you can launch the graph for selected QA probes from any one of the following Inventory views:

   QA Probes View

   Critical Probes View

   Threshold Exceptions Probe View

   Baseline Exception Probes View
3. To launch the graph for QA probes configured on a node, follow these steps:
   a. Click **Inventory** in the Workspaces panel.
      The **Inventory** tab expands.
   b. Click **Nodes**, and the Node view appears.
      Select the node for which you need to view the Real Time Line graph.

[1] QA probe has stopped.

   c. Select **Actions** → **Quality Assurance** → **Graph** → **<Service>** → **<metric name>** → **<metric sub menu>**

4. Alternatively, to launch the graph for selected QA probes, follow these steps:
   a. Click **Quality Assurance** in the Workspaces panel. The Quality Assurance tab expands, displaying the **QA Probes** view.

   b. Select the QA probes for which you require to view the Real Time Line graph.

   c. Select **Actions** → **Quality Assurance** → **Graph** →**<metric name>** → **<metric sub menu>**

   If a node has numerous probes configured, it is recommended you launch the Real Time Line graph for selected probes rather than launching the Real Time Line graph for a node. This facilitates you to make use of the Real Time Line graph effectively.

5. The following table lists the valid **service**, **metric name** and the **metric sub menu**:

Service	Metric Name	Metric Sub Menu
UDP or TCP or VOIP	Jitter	▪ Negative Jitter DS ▪ Negative Jitter SD ▪ Positive Jitter DS ▪ Positive Jitter SD ▪ Two Way Jitter DS is the acronym for Destination to Source and SD is the acronym for Source to Destination.
	Packet Loss	▪ Packet Loss DS ▪ Packet Loss SD ▪ Two Way Packet Loss DS is the acronym for Destination to Source and SD is the acronym for Source to Destination.
	Round Trip Time	▪ Average RTT in Milliseconds ▪ Average RTT in Microseconds
	Mean Opinion Score This option appears only for VOIP service	
ICMP Echo	Round Trip Time	▪ Average RTT in Milliseconds ▪ Average RTT in Microseconds
UDP Echo	Round Trip Time	▪ Average RTT in Milliseconds ▪ Average RTT in Microseconds

The Real Time Line Graph appears. In a Global Network Management environment, you cannot view the Real Time Line graph for the **Remote QA Probes**[1].

Also, you can view the Real Time Line graph only for the metrics supported by the vendor-specific devices.

All the metrics of NNM iSPI Performance for QA are supported by Cisco devices.

The Juniper RPM devices supports the following metrics:

- Negative Jitter DS
- Negative Jitter SD
- Positive Jitter DS
- Positive Jitter SD
- Two Way Packet Loss
- Average RTT in Milliseconds

The other devices supporting the DISMAN Ping using RFC 4560 supports only the RTT Milliseconds metric.

An error message appears if you select a metric not supported by the vendor device.

6. You can view a tool bar in the Real Time Line Graph, which facilitates you to traverse and extensively use the graph. The tool bar has the following menus and sub-menus:

Menus	Sub-Menus	Description
File	Select Lines...	Used to select lines in the real time line graph
	Export to CSV	Used to export the real time line graph to a `csv` file
	Print...	Used to print the real time line graph
View	Legend	Used to view the legend for the real time line graph.
	Time Line Viewer	Used to highlight the section of the data in the graph and continues to display all the data available.
	Lock Y-Axis	Used to lock or unlock the Y-axis while viewing time segments of the graph
	Notification History	Used to view the notification history in a pop up window.
Help	Graph Data Description	Used to get a help on the graph data description
	Using Line Graphs	Used to get a help on using line graphs

[1] Remote QA probes are primarily discovered and polled at the regional manager.

See *Using Line Graphs* topic in the *HP Network Node Manager Online Help* for more information on the toolbar menus, sub-menus, zoom factor, timeline viewer, and any other details pertaining to the graph.

7. You can select the polling interval:

Field Name	Description
Polling Interval (s)	Select the polling interval in seconds to view the real time line graph for the selected interval.

You can specify a polling interval, which is greater than the QA probe polling frequency to make optimal usage of the graph.

If you launch the graph for QA probes configured on multiple nodes, you can view the following:

The X-Axis displays the unit of time, and the Y-Axis displays the selected metric for which you can view the graph.

You can view the graph of all the QA probes configured on the nodes and infer the trend of the metric for the time period. Each QA probe is identified by a unique color to distinguish the trend of all the QA probes in the graph. The color representing each QA probe appears in the legend of the graph.

If you launch the graph for for selected QA probes, you can view the following:

The X-Axis displays the unit of time, and the Y-Axis displays the selected metric for which you can view the graph.

You can view the graph of the selected QA probes and infer the trend of the metric for the time period. Each QA probe is identified by a unique color to distinguish the trend of all the selected probes in the graph. The color representing each QA probe appears in the legend of the graph.

Related Topics

Overview of Real Time Line Graph

Root Cause Analysis for QA Probe Failure

Using root cause analysis, NNM iSPI Performance for QA performs the following tasks on the failed QA probes:

- Identify the underlying cause when a QA probe fails to run.
- Correlate the probe failures that can be associated with the same cause.
- Generate a common incident for the QA probes failed for a common cause.

You can identify the cause of probe failure using these incidents:

Causes for QA Probe Failure Between Nodes

When a specific source IP address fails to reach a specific destination IP address

Incident Generated: TestDestNotReachable

Severity: Critical

Root Cause Analysis:

- All ICMP probes from a source IP address to a destination IP address fail.
- Destination IP address cannot be reached from the source IP address.

As a result, all other QA probes configured for the destination IP address fail. The incident denotes reachability failure and correlates all the other probe failures with it.

When any source IP address fails to reach a specific destination IP address

Incident Generated: TestDestDown

Severity: Critical

Root Cause Analysis:

- All ICMP probes from any source IP address to a specific destination IP address fail.
- Destination node is down.

As a result, all other QA probes configured for the destination IP address fail. The incident denotes that the destination node is down and correlates all the other probe failures from all source IP addresses with it.

When a service type fails between a source IP address and destination IP address

Applicable only if more than one QA probe of the same service type runs between the selected source and destination IP addresses.

Incident Generated: TestServiceNotReachable

Severity: Critical

Root Cause Analysis:

- All probes for a service type fail between a specific source IP addresses and destination IP address.
- The service type is unavailable between the source and destination IP addresses.

As a result, all other QA probes of the same service type configured for the destination IP address fail. The incident denotes that the service type is unavailable and correlates all the other probe failures with it.

When a service type fails between any source IP address and a specific destination IP address

Incident Generated: TestServiceDown

Severity: Critical

Root Cause Analysis:

- All probes for a service type fail from all source IP addresses to a specific destination IP address.
- The service type is unavailable on the destination IP address.

As a result, all other QA probes of the same service type configured for the destination IP address fail. The incident denotes that the service type on the destination node is unavailable and correlates all the other probe failures from all source IP addresses with it.

Causes for QA Probe Failure Between Sites

When a specific source site fails to reach a specific destination site

Incidents Generated:

- SiteNotReachable

  Severity: Critical
- SiteReachable

  Severity: Normal

Root Cause Analysis:

- All ICMP probes from a source site to a destination site fail.
- Destination site cannot be reached from the source site.

As a result, all other QA probes configured for the destination site fail. The incident denotes reachability failure and correlates all the other probe failures with it.

When any source site fails to reach a specific destination site

Incidents Generated:

- SiteDown

  Severity: Critical
- SiteUp

  Severity: Normal

Root Cause Analysis:

- All ICMP probes from any source site to a specific destination site fail.
- Destination site is down.

As a result, all other QA probes configured for the destination site fail. The incident denotes that the destination site is down and correlates all the other probe failures from all source sites with it.

When a service type fails between a source site and destination site

Incidents Generated:

- ServiceToSiteNotReachable

  Severity: Critical
- ServiceToSiteReachable

  Severity: Normal

Root Cause Analysis:

- All probes for a service type fail between a specific source site and destination site.
- The service type is unavailable between the source and destination sites.

As a result, all other QA probes of the same service type configured for the destination site fail. The incident denotes that the service type is unavailable and correlates all the other probe failures with it.

When a service type fails between any source site and a specific destination site

Incident Generated:

- ServiceToSiteDown

  Severity: Critical

- ServiceToSiteUp

  Severity: Normal

Root Cause Analysis:

- All probes for a service type fail from all source sites to a specific destination site.
- The service type is unavailable on the destination site.

As a result, all other QA probes of the same service type configured for the destination site fail. The incident denotes that the service type on the destination site is unavailable and correlates all the other probe failures from all source sites with it.

Correlated Incidents

The following table lists the incidents raised and affected by NNM iSPI Performance for QA Root Cause Analysis:

TestDestNotReachable	Critical	TestFailed
TestDestDown	Critical	• TestDestNotReachable • TestServiceDown
TestServiceNotReachable	Critical	TestFailed
TestServiceDown	Critical	TestServiceNotReachable
SiteNotReachable	Critical	TestDestDown
SiteDown	Critical	SiteNotReachable

NNM iSPI Performance for QA Site Map

You can view the performance of a network in a QA probe inventory view or form view. However, in a large enterprise networks, you need to assess the performance of each site, and monitor the overall network performance. Site Map enables you to easily identify the performance of any site and gives a holistic view of the network.

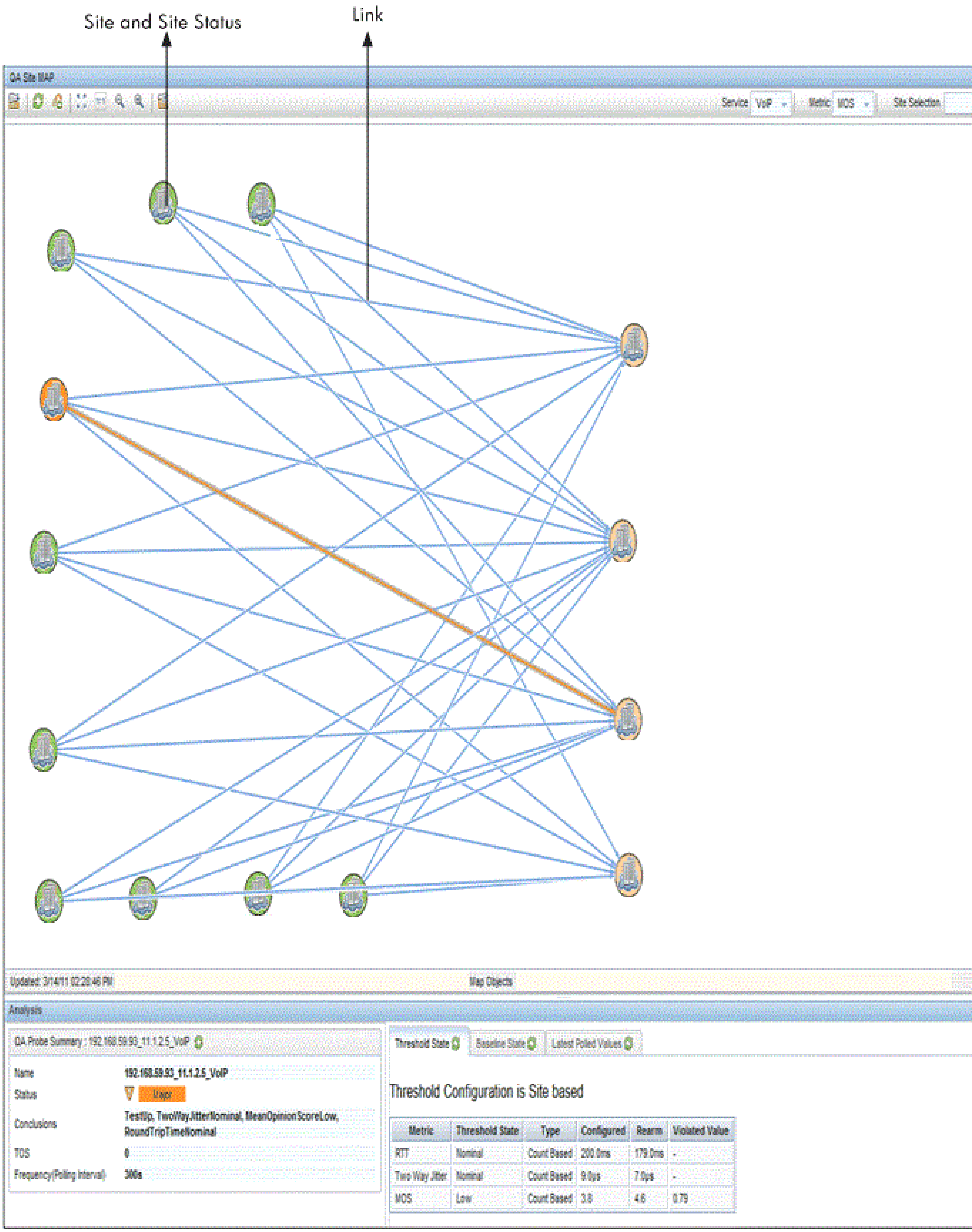
The site map represents the **sites**[1] as nodes, and the most severe probe status as links between the sites.

You can understand the terminologies used in site map by referring to the following table:

Terminology	Description
Site Status	Links are unidirectional for the QA probes originating from the source to destination site. The color of the link is based on the threshold state of the probe for the selected service and metric. In the case of a two-way jitter, the link color is based on the threshold state of the metric in the source, and destination sites.
Links	Links are unidirectional for the QA probes originating from the source to destination site. The color of the link is based on the threshold state of the probe for the selected service and metric. In the case of a two-way jitter, the link color is based on the threshold state of the metric in the source, and destination sites

Example: The following site map with the labels enable you to understand the icons used to depict the site, site status, and links in a site map.

[1] A logical organization of networking devices. In the scope of enterprise networks, a site can be a logical grouping of networking devices generally situated in similar geographic location. The location can include a floor, building or an entire branch office or several branch offices which connect to head quarters or another branch office via WAN/MAN. Each site is uniquely identified by its name. In case of the service provider networks the Virtual Routing and Forwarding (VRF) on a Provider Edge (PE) router or a Customer Edge (CE) routers can be defined as a site.



Service: VoIP

Metric: MOS

Updated: 3/14/11 02:20:46 PM

QA Probe Summary : 192.168.59.93_11.1.2.5_VoIP

Name	192.168.59.93_11.1.2.5_VoIP
Status	Major
Conclusions	TestUp, TwoWayJitterNominal, MeanOpinionScoreLow, RoundTripTimeNominal
TOS	0
Frequency(Polling Interval)	300s

Threshold Configuration is Site based

Metric	Threshold State	Type	Configured	Rearm	Violated Value
RTT	Nominal	Count Based	200.0ms	179.0ms	-
Two Way Jitter	Nominal	Count Based	9.0µs	7.0µs	-
MOS	Low	Count Based	3.8	4.6	0.79

You can retrieve the data from NNM iSPI Performance for QA, and you can view the site map in the NNMi console.

You can view the site map only if you have the permission to access at least one QA probe in the site.

Site status and the overall view of the site map varies based on your access to a set of probes in a site. If you have access to a set of probes in a site, the site status appears based on the overall status of those probes in a site.

The following table shows the coloring scheme for the site status or the QA probe status:

Status Color	Status Description
⬜	No Status/Disabled/Warning
🟩	Normal
🟦	Unknown
🟧	Major
🟥	Critical

If there are no probes configured in a destination site, the site status displays in Gray color indicating - No Status. However, if there are no probes configured from the source to the destination site, no link appears between the source and the destination site.

The following table shows the coloring scheme of the link or the Threshold state:

Link Color	Threshold State Description
🟥	High
🟩	Nominal
🟥	Low Applicable only for the Mean Opinion Score (MOS) metric of the VoIP service
🟦	Threshold Not Set / Undefined / Not Polled / No Polling Policy

You can double-click on the link in the site map to view the QA Probe summary details in the Analysis pane. In addition, you can double-click on the site to get a form view of all the QA Probes originating from the site.

Launching the Site Map

To launch the site map, follow these steps:

1. Log on to NNMi console using your username and password.
2. Select **Action** → **Quality Assurance** → **Site Map** from the NNMi console to view the site map.

3. Select the service from the **Service** drop-down list. By default, NNM iSPI Performance for QA populates the `ICMP Echo` service. See the table below for more information.

4. Select the metric from the **Metric** drop-down list. By default, NNM iSPI Performance for QA populates the `RTT` metric name. See the table below for more information.

5. Optionally, type the site or search string of the sites for which you intend to view the site map in the **Site Selection** box.

6. Click on **Launch** to launch the site map for the selected service and metric.

The site map displays the source site if the destination site is not configured. The site map appears only if there are probes configured in the source site.

The site map automatically refreshes every five minutes.

You can perform the following tasks using the Site Map page:

Icons Available in the Site Map Toolbar	Description
Open	Opens the selected site details
Refresh	Refreshes the view, site **status**[1] and **link status**[2] in the site map.
Refresh Status	Refreshes only the site status in the site map
Service ICMP Echo Service	Select any one of the following Services from the drop-down list for which you intend to view the site map: • UDP Echo • ICMP Echo • UDP • TCP Connect • VoIP By default, NNM iSPI Performance for QA populates the `ICMP Echo` Service.
Metric RTT Metric	Select any one of the following metrics from

[1] The status and coloring scheme of the map component is derived based on the most severe operational status of all the QA probes originating from the source map component for the selected service, and metric. A map component can be a site in Site Map or node in Node Map.

[2] Links are unidirectional for the QA probes originating from the source to destination site. The color of the link is based on the threshold state of the probe for the selected service and metric. Note: In the case of a two-way jitter, the link color is based on the threshold state of the metric in the source, and destination sites

Icons Available in the Site Map Toolbar	Description
	the drop-down list for which you intend to view the site map: • RTT • + ve Jitter • -ve Jitter • TwoWay Packet Loss • TwoWay Jitter • MOS By default, NNM iSPI Performance for QA populates the `RTT` Metric Type. +ve and -ve Jitter are always from source to destination in the site map. +ve Jitter, -ve Jitter, and Two-Way Jitter metrics are applicable only for UDP and VoIP service. The Mean Opinion Score (MOS) metric is applicable only for VoIP service.
Site Selection	Type the name of the site or the search string of the sites, and click ↻ to view a specific set of sites in the site map . You can enter the site name partially with the wild card asterisk "*" (to replace any number of characters) to retrieve all the sites based on the search string. For example, if you intend to view all the sites starting with `Ban`, you need to enter `Ban*` in the search string. Also, you can use the wild card "?" to replace one character in the search string. For example, if you intend to view the sites starting with any one character followed by the string `test_site`, you need to enter `?test_site` in the search string. You can also use a combination of the wildcard * and ? in the search string. This search for the sites is **case-sensitive**.
⚙ Launch	Launches the site map based on the selection. The site map also launches for the sites

Icons Available in the Site Map Toolbar	Description
	which have no destination sites.
🔍 Find	Displays a drop-down list where you can select the site which you want to find in the site map.

Click here to view a typical site map.

The site map displays a message if you select a wrong combination of the service and metric. For example, if you select ICMP Echo and +ve Jitter metric, a message appears indicating that the +ve Jitter metric is valid for UDP or VOIP Service.

If some QA probes in a site are disabled and others are of Nominal status, the Site map displays the Site status as Nominal. While displaying the color of the Site Status, the QA probes of Disabled status has lesser priority compared to Normal QA probe status.

Analysis Pane

Select the site by clicking on the site in the site map to view the Analysis pane of the selected site. You can view the summary of the selected site. In addition, you can view the pie charts of the Destination Site Probe Status Distribution in percentage, and Source Site Probe Status Distribution in percentage by clicking on the respective tabs.

The Site status displays the over all status of all probes from the source node.

NNM iSPI Performance for QA Global Node Response View

Global Node Response View enables you to view the status of all the discovered nodes and provides you with a comprehensive overview of the network health and performance.

The Global Node Response View represents all nodes available in the network. You can select a source node or destination node and filter the view to display the status of selected nodes.

The links between the nodes reflect the status of the probes running between the nodes.

You can understand the terminologies used in Global Node Response View by referring to the following table:

Terminology	Description
Node Status	The status and coloring scheme of a node is derived based on the node status as displayed in NNMi
Links	The status and coloring scheme of the links is derived based on the most severe operational status of the QA probes originating from the source node for the selected service, and metric. NNM iSPI Performance for QA displays a thick link more than one QA probe of the selected type runs between the source node and destination nodes. The status of the link is derived based on the most severe QA probe status.

The node status and the Global Node Response View depends on whether you have access to a set of probes originating from a node. If you have access to a set of probes originating from a node, the node status appears based on the overall status of those probes.

The node status and Global Node Response View can be different for another user depending on the QA probes that they can access.

The following table lists the coloring scheme for the node status in a Global Node Response View:

Status Color	Status Description
▨	No Status/Disabled/Warning/Undiscovered Destination Node
✓	Normal
?	Unknown NNM iSPI Performance for QA displays the node status as Unknown for the following reasons: • If the destination node is not yet polled. • If the destination node is not reachable due to router failure.
▼	Major
✖	Critical

If there are no probes configured between the source and destination node, no link appears between the source and the destination node.

The following table lists the coloring scheme of the link between two nodes (threshold state):

Link Color	Threshold / Baseline State
✖	High
✓	Nominal
✖	Low Applicable only if you select the following: • Service: VoIP • Metric: Mean Opinion Score (MOS)
?	Threshold Not Set / Undefined / Not Polled / No Polling Policy

You can double-click on the link in the Global Node Response View to view the QA Probe summary details in the Analysis pane. In addition, you can double-click on the node to get a form view of all the QA Probes originating from the node.

Launching the Global Node Response View

To launch the Global Node Response View, follow these steps:

1. Log on to NNMi console using your username and password.
2. Select **Actions** → **Quality Assurance** → **Global Node Response View** from the NNMi console to view the Global Node Response View.
3. Select the type of the view in the **Type** list.
4. Select the service in the **Service** list. By default, NNM iSPI Performance for QA displays the `ICMP Echo` service.
5. Select the metric in the **Metric** list. By default, NNM iSPI Performance for QA displays the `Availability` metric.
6. Select the type of exception raised on the selected metric in the Exception Mode list.
7. *Optional.* Type the source or destination node in the **Source** and **Destination** box.

   The response view appears only if there are probes configured in the source node.
8. Click on **Launch** to launch the Global Node Response View for the selected filter criteria.

The Global Node Response View automatically refreshes every five minutes.

You can perform the following tasks using the Global Node Response View form:

Icons Available in the Global Node Response View Toolbar	Description
Open	Opens the selected node details
Refresh	Refreshes the view, node **status**[1] and **link status**[2] in the Global Node Response View
Refresh Status	Refreshes only the node status in the Global Node Response View
Type	Select any of the following options: • Between[3]

[1] The status and coloring scheme of the map component is derived based on the most severe operational status of all the QA probes originating from the source map component for the selected service, and metric. A map component can be a site in Site Map or node in Node Map.

[2] Links are unidirectional for the QA probes originating from the source to destination site. The color of the link is based on the threshold state of the probe for the selected service and metric. Note: In the case of a two-way jitter, the link color is based on the threshold state of the metric in the source, and destination sites

[3] Enables the Global Node Response View to display bi-directional links between the selected source and destination nodes.

Icons Available in the Global Node Response View Toolbar	Description
	- Source Centric[1] - Destination Centric[2]
Service	Select any one of the following Services from the drop-down list: - DNS - HTTP - HTTPS - ICMP Echo (Default) - ORACLE - TCP Connect - UDP Echo - UDP Jitter - VoIP
Metric	Select any one of the following metrics: - + ve Jitter - -ve Jitter - Availability (Default) - MOS - RTT - Two Way Jitter - Two Way Packet Loss - +ve and -ve Jitter always apply from source node to destination node - +ve Jitter, -ve Jitter, and Two Way Jitter metrics are applicable only for UDP and VoIP services. - Mean Opinion Score (MOS) metric is applicable only for the VoIP service.

[1] Enables the Global Node Response View to display links from the selected source node and all the destination nodes. This is the default selection.
[2] Enables the Global Node Response View to display links between the selected destination node and the source node.

Icons Available in the Global Node Response View Toolbar	Description
Launch	Launches the Global Node Response View based on the selection.
Find	Displays a drop-down list where you can select the node which you want to find in the Global Node Response View.

If some QA probes configured for a node are disabled and others are of Nominal status, the Global Node Response View displays the node status as Nominal. While displaying the color of the Node Status, the QA probes of Disabled status has lesser priority compared to Normal QA probe status.

Select the node by clicking on the node in the Global Node Response View to view the Analysis pane of the selected node. The Analysis pane displays the summary and the detailed information of the selected node.

The node status displays the over all status of all probes from the source node.

NNM iSPI Performance for QA Node Response View

You can view the performance of a network in a QA probe inventory view or form view. However, to understand the network performance on a more granular level, you need to assess the performance of each node that builds your network. Node Response View enables you to easily monitor the performance of any node and identify the performance of a network path.

You can view the performance of selected nodes using this map.

The Node Response View represents nodes available in the network for a selected filter criteria. The links between the nodes reflect the status of the probes running between the nodes.

You can understand the terminologies used in Node Response View by referring to the following table:

Terminology	Description
Node Status	The status and coloring scheme of a node is derived based on the node status as displayed in NNMi
Links	The status and coloring scheme of the links is derived based on the most severe operational status of the QA probes originating from the source node for the selected service, and metric. NNM iSPI Performance for QA displays a thick link more than one QA probe of the selected type runs between the source node and destination node. The status of the link is derived based on the most severe QA probe status.

You can view the Node Response View only if you have permissions to access at least one QA probe originating from the source node.

The node status and the Node Response View depends on whether you have access to a set of probes originating from a selected node. If you have access to a set of probes originating from a selected node, the node status appears based on the overall status of those probes.

The node status and Node Response View can be different for another user depending on the QA probes that they can access.

The following table lists the coloring scheme for the node status in a Node Response View:

Status Color	Status Description
▨	No Status/Disabled/Warning/Undiscovered Destination Node
✓	Normal
?	Unknown NNM iSPI Performance for QA displays the node status as Unknown for the following reasons: • If the destination node is not yet polled. • If the destination node is not reachable due to router failure.
▼	Major
✖	Critical

If there are no probes configured between the source and destination node, no link appears between the source and the destination node.

The following table lists the coloring scheme of the link between two nodes (threshold state):

Link Color	Threshold / Baseline State
✖	High
✓	Nominal
✖	Low Applicable only if you select the following: • Service: VoIP • Metric: Mean Opinion Score (MOS)
?	Threshold Not Set / Undefined / Not Polled / No Polling Policy

You can double-click on the link in the Node Response View to view the QA Probe summary details in the Analysis pane. In addition, you can double-click on the node to get a form view of all the QA Probes originating from the node.

Launching the Global Node Response View

To launch the Global Node Response View, follow these steps:

1. Log on to NNMi console using your username and password.
2. Select **Actions** → **Quality Assurance** → **Global Node Response View** from the NNMi

console to view the Global Node Response View.

3. Select the type of the view in the **Type** list.
4. Select the service in the **Service** list. By default, NNM iSPI Performance for QA displays the `ICMP Echo` service.
5. Select the metric in the **Metric** list. By default, NNM iSPI Performance for QA displays the `Availability` metric.
6. Select the type of exception raised on the selected metric in the Exception Mode list.
7. *Optional.* Type the source or destination node in the **Source** and **Destination** box.

   The response view appears only if there are probes configured in the source node.

8. Click on **Launch** to launch the Global Node Response View for the selected filter criteria.

The Global Node Response View automatically refreshes every five minutes.

You can perform the following tasks using the Global Node Response View form:

Icons Available in the Global Node Response View Toolbar	Description
Open	Opens the selected node details
Refresh	Refreshes the view, node **status**[1] and **link status**[2] in the Global Node Response View
Refresh Status	Refreshes only the node status in the Global Node Response View
Type	Select any of the following options: • Between[3] • Source Centric[4] • Destination Centric[5]

[1] The status and coloring scheme of the map component is derived based on the most severe operational status of all the QA probes originating from the source map component for the selected service, and metric. A map component can be a site in Site Map or node in Node Map.

[2] Links are unidirectional for the QA probes originating from the source to destination site. The color of the link is based on the threshold state of the probe for the selected service and metric. Note: In the case of a two-way jitter, the link color is based on the threshold state of the metric in the source, and destination sites

[3] Enables the Global Node Response View to display bi-directional links between the selected source and destination nodes.

[4] Enables the Global Node Response View to display links from the selected source node and all the destination nodes. This is the default selection.

[5] Enables the Global Node Response View to display links between the selected destination node and the source node.

Icons Available in the Global Node Response View Toolbar	Description
Service	Select any one of the following Services from the drop-down list: • DNS • HTTP • HTTPS • ICMP Echo (Default) • ORACLE • TCP Connect • UDP Echo • UDP Jitter • VoIP
Metric	Select any one of the following metrics: • + ve Jitter • -ve Jitter • Availability (Default) • MOS • RTT • Two Way Jitter • Two Way Packet Loss • +ve and -ve Jitter always apply from source node to destination node • +ve Jitter, -ve Jitter, and Two Way Jitter metrics are applicable only for UDP and VoIP services. • Mean Opinion Score (MOS) metric is applicable only for the VoIP service.
Launch	Launches the Global Node Response View based on the selection.
Find	Displays a drop-down list where you can select the node which you want to find in the Global Node Response View.

If some QA probes configured for a node are disabled and others are of Nominal status, the Global Node Response View displays the node status as Nominal. While displaying the color of the Node Status, the QA probes of Disabled status has lesser priority compared to Normal QA probe status.

Select the node by clicking on the node in the Global Node Response View to view the Analysis pane of the selected node. The Analysis pane displays the summary and the detailed information of the selected node.

The node status displays the over all status of all probes from the source node.

NNM iSPI Performance for QA Class Based Quality of Service (CBQoS)

NNM iSPI Performance for QA enables you to monitor **Class Based Quality of Service** (CBQoS) managed network elements available in your NNMi environment. Using NNM iSPI Performance for QA, you can monitor the health and performances of CBQoS managed interfaces, policies and classes. The CBQoS related views enable you to:

- Discover and list the CBQoS interfaces available in the network and the CBQoS policies and actions applied on the CBQoS interfaces
- Discover and list the CBQoS policies configured in the network. Also the mapping between these policies, classes and CBQoS interfaces
- Monitor the threshold state and raise incidents for the breached thresholds

NNM iSPI Performance for QA supports only Cisco CBQoS interfaces and nodes. NNM iSPI Performance for QA uses the CISCO-CLASS-BASED-QOS-MIB to collect the CBQoS performance data.

Accessing the CBQoS Interfaces Inventory View

CBQoS Interfaces inventory view enables you to view the list of discovered interfaces for which the CBQoS Policies are configured. The traffic can be ingress or egress for an interface.

To launch the CBQoS Interfaces Inventory view:

1. Log on to NNMi console using your username and password.
2. Click **Quality Assurance** in the Workspaces panel.
3. Click **CBQoS Interfaces** to view the CBQoS enabled interfaces that are discovered in the network.

To view the Interface Inventory for a selected interface:

1. Select an interface in the CBQoS Interface Inventory view and click **Open**.
2. In the CBQoS Interface form, click **Lookup** for the Interface Name field to open the Interface form for the selected interface.

You can open the CBQoS Interface Inventory view using the Nodes Inventory view. To open the CBQoS Interface Inventory view:

1. Select **Inventory** in the Workspaces panel.
2. Select **Nodes**.

3. Select a node and click **Open**.
4. In the Node form, select CBQoS Interfaces tab.
5. Select a CBQoS interface and click **Open** to open the CBQoS Interface Inventory view.

Key Attributes of the CBQoS Interfaces Inventory View

The CBQoS Interfaces Inventory view displays the following key attributes

Attribute Name	Description
Interface Name	The name of interface.
Hosted on Node	The name of the node on which the interface resides.
In Policy	The name of the **In policy**[1] associated with the interface. This attribute displays only the **parent policy**[2] name.
Out Policy	The name of the **Out policy**[3] associated with the interface. This attribute displays only the **parent policy**[4] name.
Applied On	The interface on which the policy is applied. Possible values are: - Control Plane - Interface
Tenant	Specifies the NNMi tenant selected for the interface
Management Server	Specifies whether the NNMi management server is local or specifies the name of the regional manager.
Management Mode	Specifies whether the source node is managed or not

[1] In Policy defines the policy which is applied to the incoming traffic.

[2] The policy that contains references to other policy configurations. NNM iSPI Performance for QA displays only one hierarchical level for policies. For example, Policy1 contains references for Policy2 and NNM iSPI Performance for QA considers Policy2 as the child policy of Policy1. If Policy2 contains references to Policy3, the inventory views do not display Policy3 as a child of Policy1. NNM iSPI Performance for QA does not support hierarchical policies in Global Network Management environment.

[3] Out Policy defines the policy which is applied to the outgoing traffic.

[4] The policy that contains references to other policy configurations. NNM iSPI Performance for QA displays only one hierarchical level for policies. For example, Policy1 contains references for Policy2 and NNM iSPI Performance for QA considers Policy2 as the child policy of Policy1. If Policy2 contains references to Policy3, the inventory views do not display Policy3 as a child of Policy1. NNM iSPI Performance for QA does not support hierarchical policies in Global Network Management environment.

Attribute Name	Description
	Possible states are as follows: • Managed: Indicates that the node is managed. • Not Managed: Indicates that the node is not managed on purpose. • Out of Service: Indicates that a node is unavailable because it is out of service.

You can filter the interfaces listed in this view based on all columns of this view. However, make sure that you apply filter on either the In Policy or the Out Policy column. If you apply filter on both these columns, NNM iSPI Performance for QA discards both these filters and applies any other filter that you may have configured for the other columns.

If you apply the filter 'Not Equal To This Value' on either the In Policy or the Out Policy columns, NNM iSPI Performance for QA filters out the following interfaces:

- Interfaces whose in policy or out policy names do not match the filter value
- Interfaces whose in policy or out policy values are NULL.

Note: The default time interval to refresh is 300 seconds, or 5 minutes.

Analysis Pane

The Analysis Pane shows the details of the selected CBQoS Interface, such as, Interface Name, Interface Description, Interface Speed, In Policy, and Out Policy.

The **Performance** panel enables you to analyze the performance faults for the selected CBQoS Interface, in the form of graphs. The graph shows the following information:

- Interface utilization of the selected CBQoS Interface.
- Bandwidth utilization of the selected CBQoS Interface.
- Availability of the selected CBQoS Interface. It denotes whether the interface is active or not.
- Pre-policy rate and Post-policy rate of the selected CBQoS Interface

You can easily monitor and analyze the performance of the CBQoS Interface, from the color of the status. Whenever any problem arises, you can view the status in the **Performance** panel. The status of the CBQoS interface enables you to easily determine the root cause of the fault.

The following table indicates the status information:

CBQoS Interface Status	Status color indicating in the graph
Nominal	🟩 Normal
High, Low	🟧 Major
Critical	🟥 Critical
No status	□ No Status

CBQoS Interface Status	Status color indicating in the graph
Unavailable, Unknown	🟦 Unknown
Not Polled, Threshold not set, Not defined	⬜ Disabled

CBQoS Interface Form: In Policy Tab

The **In Policy** tab displays information about the policies applied on the incoming traffic of the selected interface.

The In Policy tab displays the policy information for the **parent policy**[1] as well as the **child policy**[2].

Attributes: In Policy Details Tab

Attribute	Description
Action	The name of a CBQoS action. The CBQoS action can be any one of the following: • Queuing • Policing • Shaping • Packet Marking • RED
Traffic Class Name	Name of a Traffic Class mapped to the policy Click **Lookup** for the In Policy and the Out Policy fields to view information on the policies associated with the traffic class. To view the CBQoS class map details for the selected traffic class, see CBQoS Class Map Form.

[1] The policy that contains references to other policy configurations. NNM iSPI Performance for QA displays only one hierarchical level for policies. For example, Policy1 contains references for Policy2 and NNM iSPI Performance for QA considers Policy2 as the child policy of Policy1. If Policy2 contains references to Policy3, the inventory views do not display Policy3 as a child of Policy1. NNM iSPI Performance for QA does not support hierarchical policies in Global Network Management environment.

[2] The policy that the parent policy refers to. NNM iSPI Performance for QA does not support hierarchical policies in Global Network Management environment.

CBQoS Interfaces Form: Out Policy Details Tab

The **Out Policy** tab displays information about the policies applied on the outgoing traffic of the selected interface.

The Out Policy tab displays the policy information for the **parent policy**[1] as well as the **child policy**[2].

Attributes: Out Policy Details Tab

Attribute	Description
Action	The name of a CBQoS action. The CBQoS action can be any one of the following: • Queuing • Policing • Shaping • Packet Marking • RED
Traffic Class Name	Name of a Traffic Class mapped to the policy Click **Lookup** for the In Policy and the Out Policy fields to view information on the policies associated with the traffic class. To view the CBQoS class map details for the selected traffic class, see CBQoS Class Map Form.

CBQoS Interfaces Form: Threshold State Tab

The **Threshold State** tab displays information on discovered threshold states for the selected interface.

[1] The policy that contains references to other policy configurations. NNM iSPI Performance for QA displays only one hierarchical level for policies. For example, Policy1 contains references for Policy2 and NNM iSPI Performance for QA considers Policy2 as the child policy of Policy1. If Policy2 contains references to Policy3, the inventory views do not display Policy3 as a child of Policy1. NNM iSPI Performance for QA does not support hierarchical policies in Global Network Management environment.

[2] The policy that the parent policy refers to. NNM iSPI Performance for QA does not support hierarchical policies in Global Network Management environment.

The Threshold State tab displays the threshold states for the **parent policy**[1] as well as the **child policy**[2].

The threshold defined on a policy is applied to all the classes configured for the policy. Even if you do not configure any action for a class of a policy, but configure a threshold for the policy, NNM iSPI Performance for QA applies the threshold on every class and displays them in the Threshold State tab. For example, even if you have not defined an action for the Class-Default for a policy, but configured a threshold on the policy, NNM iSPI Performance for QA displays Class-Default in the Threshold State tab.

Attributes: Threshold State Tab

Attribute	Description
State	Threshold state for the CBQoS elements Can be any of the following values: • High:[3] • Nominal:[4] • Not Defined:[5]
Metric	Name of the metric that has crossed the threshold state for the configured CBQoS interface
Direction	Indicates whether the threshold was applied on the incoming or outgoing traffic for the selected interface.
Traffic Class Name	Displays the name of a Traffic Class mapped to the policy Click **Lookup** for the In Policy and the Out Policy fields to view information on the policies associated with the traffic class. To view the CBQoS Class Details for the selected traffic class, follow these steps:

[1] The policy that contains references to other policy configurations. NNM iSPI Performance for QA displays only one hierarchical level for policies. For example, Policy1 contains references for Policy2 and NNM iSPI Performance for QA considers Policy2 as the child policy of Policy1. If Policy2 contains references to Policy3, the inventory views do not display Policy3 as a child of Policy1. NNM iSPI Performance for QA does not support hierarchical policies in Global Network Management environment.

[2] The policy that the parent policy refers to. NNM iSPI Performance for QA does not support hierarchical policies in Global Network Management environment.

[3] Specifies that the metric value for the CBQoS policy crossed the configured threshold value.

[4] Specifies that the metric value for the CBQoS policy is within the configured threshold value

[5] Specifies that the threshold was configured, but NNM iSPI Performance for QA did not poll the device.

Attribute	Description
	1. Click **Lookup** for the In Policy or Out Policy fields. 2. Select **Open** to open the CBQoS Policy form. 3. Select **Traffic Classes** tab, select a traffic class and click **Open** to open the CBQoS Class Map form. This form displays the action definitions associated with a class. For example, if the queuing action is configured for Class A, the CBQoS Class Map form displays a tab for queuing action. The tab displays the properties and the value for each property. The values for these properties are measured in bits per second (bps). This form does not display the details for nested classes.
Type	Type of the threshold set for the metric. Can be of the following types: - Count: [1] - Time: [2]
High Value	Threshold value that the administrator has configured for the policy NNM iSPI Performance for QA raises an incident when the metric value crosses the configured threshold value and sets the threshold state to High.
High Value Rearm	Rearm value that the administrator has configured for the policy NNM iSPI Performance for QA raises an incident when the metric value crosses the configured threshold value. When the metric value reaches the rearm value, NNM iSPI Performance for QAclears the incident and sets the threshold state to Nominal.

Each time the NNM iSPI Performance for QA starts running on the Global Manager, the Global Manager pulls the changed threshold states from all Regional Managers since the last run of NNM iSPI Performance for QA. The Global Manager then raises incidents for the overall health of the configured CBQoS policies in the network, based on these threshold states. However, the Global Manager does not display the threshold values configured in the Regional Managers.

To view the details about a threshold, select a threshold and click **Open** and display the Threshold State Details form.

CBQoS Interfaces Form: Incidents Tab

The Incidents tab displays information on the incidents raised on the selected interface.

[1] NNM iSPI Performance for QA raises an incident only if the threshold for the configured CBQoS policy is crossed for a pre-specified number of times consecutively.

[2] NNM iSPI Performance for QA raises an incident only if the metric value is beyond the threshold value for a pre-specified time period.

Attributes: Incidents Tab

Attribute	Description
Severity	Seriousness that NNMi calculates for the incident. Possible values are: • Normal • Warning • Minor • Major • Critical • Unknown • Disabled • Not Polled • No Status
Lifecycle State	Identifies where the incident is in the incident lifecycle.
Last Occurrence	Used when suppressing duplicate incidents or specifying an incident rate. Indicates the time when the duplicate or rate criteria were last met for a set of duplicate incidents or for a set of incidents that has a rate criteria that was met. If there are no duplicate incidents or incidents that have a rate criteria that were met, this date is the same as the First Occurrence Time.
Correlation Nature	This incident's contribution to a root-cause calculation, if any.
Source Node	The Name attribute value of the node associated with the incident. Click the **Lookup** icon and select **Show Analysis** or **Open** to display the Node Form for more information about the node.
Source Object	Name used to indicate the configuration item that is malfunctioning on the source node. Click the **Lookup** icon and select **Show Analysis** or **Open** to display the Node Form for more information about the object.
Message	The incident message defined by NNMi

The global manager raises incidents for the overall health of the configured CBQoS interfaces in the network, based on the threshold states collected from all regional managers.

For detailed information on NNMi incidents, see *Incident Form* topic in HP Network Node Manager i Software *Help for Operators*.

CBQoS Interfaces Form: Analysis Pane

The Analysis Pane shows the details of the selected CBQoS Interface, such as, Interface Name, Interface Description, Interface Speed, In Policy, and Out Policy.

The **Performance** panel enables you to analyze the performance faults for the selected CBQoS Interface, in the form of graphs. The graph shows the following information:

- Interface utilization of the selected CBQoS Interface.
- Availability of the selected CBQoS Interface. It denotes whether the interface is active or not.

You can easily monitor and analyze the performance of the CBQoS Interface, from the color of the status. Whenever any problem arises, you can view the status in the **Performance** panel. The status of the probe enables you to easily determine the root cause of the fault.

The following table indicates the status information:

CBQoS Interface Status	Status color indicating in the graph
Nominal, NOMINAL	🟩 Normal
High, Low	🟧 Major
Critical	🟥 Critical
No status	🟨 No Status
UNAVAILABLE, UNKNOWN	🟦 Unknown
NOT POLLED, Not Polled, Threshold not set, Not defined	⬜ Disabled

CBQoS In or Out Policy Form

The CBQoS In or Out Policy form displays the following details:

- Traffic Class name: Name of the Traffic Class mapped to the policy
- Action: Type of action applied to the policy and associated with the Traffic Class.

Accessing the CBQoS Policies Inventory View

CBQoS Policies Inventory view enables you to view the CBQoS policies, which are configured on the interfaces and the type of CBQoS Actions applied on it.

To launch the CBQoS Policies Inventory view:

1. Log on to NNMi console using your username and password.
2. Click **Quality Assurance** in the Workspaces panel.
3. Click **CBQoS Policies** to view the CBQoS enabled policies that are discovered in the network.

Key Attributes of the CBQoS Policies Inventory View

The CBQoS Policies Inventory view displays the following key attributes

Attribute Name	Description
Policy Name	The name of the policy applied By default, this attribute displays only the **parent policy**[1] name. This attribute displays the **child policy**[2], only if the child policy is directly applied on an interface. This attribute does not display a child policy, if it is referred to by multiple parent policies.
Applied on Interfaces	The total number of interfaces to which the policy is mapped.
Hosted on Node	The name of the node on which the interface mapped to the selected policy resides
Policing	Indicates that the "Policing" action is configured for one or more traffic classes associated with the selected policy
Shaping	Indicates that the "Shaping" action is configured for one or more traffic classes associated with the selected policy
Queuing	Indicates that the "Queuing" action is configured for one or more traffic classes associated with the selected policy
Packet Marking	Indicates that the "Packet Marking" action is configured for one or more traffic classes associated with the selected policy
RED	Indicates that the "RED" action is configured for one or more traffic classes associated with the selected policy
Tenant	Specifies the NNMi tenant selected for the selected policy
Management Server	Specifies whether the NNMi management server is local or specifies the name of the regional manager.
Management Mode	Specifies whether the source node is managed or not Possible states are as follows: • Managed: Indicates that the node is managed.

[1] The policy that contains references to other policy configurations. NNM iSPI Performance for QA displays only one hierarchical level for policies. For example, Policy1 contains references for Policy2 and NNM iSPI Performance for QA considers Policy2 as the child policy of Policy1. If Policy2 contains references to Policy3, the inventory views do not display Policy3 as a child of Policy1. NNM iSPI Performance for QA does not support hierarchical policies in Global Network Management environment.

[2] The policy that the parent policy refers to. NNM iSPI Performance for QA does not support hierarchical policies in Global Network Management environment.

Attribute Name	Description
	• Not Managed: Indicates that the node is not managed on purpose. • Out of Service: Indicates that a node is unavailable because it is out of service.

You can filter the policies listed in this view based on all columns except the Hosted on Node column.

The default time interval to refresh is 300 seconds, or 5 minutes.

To view a selected CBQoS Policy:

1. In the CBQoS Policies Inventory View, select a CBQoS policy.
2. Click **Open**.
3. In the CBQoS Policy form, you can view the following information on the selected policy:
   - Interface: Displays the interface on which the policy is configured. Select the interface and click **Open** to open the CBQoS Interfaces Inventory View for the selected interface.
   - Traffic Classes: Displays the traffic classes configured for the selected policy. For more information, see CBQoS Policies Form: Traffic Classes Tab.

CBQoS Policies Form: Interface Tab

The **Interface** tab displays information on discovered interfaces for which the CBQoS policies are configured.

Attributes: Interface Tab

Attribute	Description
Interface Name	The name of interface.
Hosted On Node	The name of the node on which the interface resides.
In Policy	The name of the **In policy**[1] associated with the interface.
Out Policy	The name of the **Out policy**[2] associated with the interface.
Applied On	The interface on which the policy is applied. Possible values are: • Control Plane • Interface
Management Server	Specifies whether the NNMi management server is local or specifies the name of the regional manager.

[1] In Policy defines the policy which is applied to the incoming traffic.
[2] Out Policy defines the policy which is applied to the outgoing traffic.

CBQoS Policies Form: Traffic Classes Tab

The **Traffic Classes** tab displays the information on the set of Traffic Class names and the CBQoS actions implemented on it.

For a **parent policy**[1], the Traffic Classes tab displays the class configurations for the parent policy as well as the **child policy**[2].

Attributes: Traffic Classes Tab

Attribute	Description
Traffic Class Name	Displays the name of a Traffic Class mapped to the policy Click **Lookup** for the In Policy and the Out Policy fields to view information on the policies associated with the traffic class. To view the CBQoS Class Details for the selected traffic class, follow these steps: 1. Click **Lookup** for the In Policy or Out Policy fields. 2. Select **Open** to open the CBQoS Policy form. 3. Select **Traffic Classes** tab, select a traffic class and click **Open** to open the CBQoS Class Map form. This form displays the action definitions associated with a class. For example, if the queuing action is configured for Class A, the CBQoS Class Map form displays a tab for queuing action. The tab displays the properties and the value for each property. The values for these properties are measured in bits per second (bps). This form does not display the details for nested classes.

[1] The policy that contains references to other policy configurations. NNM iSPI Performance for QA displays only one hierarchical level for policies. For example, Policy1 contains references for Policy2 and NNM iSPI Performance for QA considers Policy2 as the child policy of Policy1. If Policy2 contains references to Policy3, the inventory views do not display Policy3 as a child of Policy1. NNM iSPI Performance for QA does not support hierarchical policies in Global Network Management environment.

[2] The policy that the parent policy refers to. NNM iSPI Performance for QA does not support hierarchical policies in Global Network Management environment.

Attribute	Description
Policy Name	Displays the name of the policy for which you have defined the class. You can use this attribute to identify the policy name for nested policies. For example, you have defined Policy1 as the parent policy. Policy2 and Policy21 are children of Policy1. The Traffic Classes tab displays the classes defined for Policy1, Policy2, and Policy21; the Policy Name attribute displays the names of the policies for each class.
Policing	Indicates that the "Policing" action is configured for one or more traffic classes associated with the selected policy
Shaping	Indicates that the "Shaping" action is configured for one or more traffic classes associated with the selected policy
Queuing	Indicates that the "Queuing" action is configured for one or more traffic classes associated with the selected policy
Packet Marking	Indicates that the "Packet Marking" action is configured for one or more traffic classes associated with the selected policy
RED	Indicates that the "RED" action is configured for one or more traffic classes associated with the selected policy

You can sort the data displayed in this tab based on all the above attributes.

CBQoS Policies Form: CBQoS Policy Hierarchy Tab

The CBQoS Policy Hierarchy tab displays the hierarchical details of the selected policy. The CBQoS Policy Hierarchy tab appears only for a policy that contains references to other policies. In other words, the CBQoS Policy form for only a parent policy displays this tab.

Attributes: CBQoS Policy Hierarchy Tab

Attribute	Description
Policy Name	The name of the parent or child policy
Direct Parent Policy	The name of the parent policy
Hierarchy Level	The hierarchy level of the policy For a parent policy, this attribute displays 0 For a child policy, this attribute displays 1

To view the traffic class associated with the selected CBQoS child policy:

1. In the CBQoS Policy Hierarchy Tab, select a CBQoS child policy.
2. Click **Open**.

3. The CBQoS Policy Hierarchy form opens displaying the traffic classes configured for the selected policy. For more information, see CBQoS Policies Form: Traffic Classes Tab.

Accessing the CBQoS Actions Inventory View

CBQoS Actions inventory view enables you to view the overview of CBQoS Actions, which are applied to interfaces based on a particular traffic flow and a policy (Incoming and Outgoing traffic).

This view displays actions configured for the **parent policy**[1] as well as the **child policy**[2]. However, the view lists all actions under the parent policy name and does not display the child policy name.

To launch the CBQoS Actions Inventory view:

1. Log on to NNMi console using your username and password.
2. Click **Quality Assurance** in the Workspaces panel.
3. Click **CBQoS Actions** to view the CBQoS enabled actions that are discovered in the network.

Key Attributes of the CBQoS Actions Inventory View

The CBQoS Actions Inventory view displays the following key attributes

<table>
<tr><th>Attribute Name</th><th>Description</th></tr>
<tr><td>State</td><td>The threshold state for the action
Can be any of the following values:
<b>Threshold States</b>
<table>
<tr><th>State</th><th>Description</th></tr>
<tr><td>🟥 High</td><td><i>For Count-Based Threshold Configuration:</i>
Indicates that the measured value of the metric is above the configured High Value and recurs for the consecutive number of times specified in the Trigger Count
<i>For Time-Based Threshold Configuration:</i>
Indicates that the measured value of the metric is above the configured High Value and this high value</td></tr>
</table>
</td></tr>
</table>

[1] The policy that contains references to other policy configurations. NNM iSPI Performance for QA displays only one hierarchical level for policies. For example, Policy1 contains references for Policy2 and NNM iSPI Performance for QA considers Policy2 as the child policy of Policy1. If Policy2 contains references to Policy3, the inventory views do not display Policy3 as a child of Policy1. NNM iSPI Performance for QA does not support hierarchical policies in Global Network Management environment.

[2] The policy that the parent policy refers to. NNM iSPI Performance for QA does not support hierarchical policies in Global Network Management environment.

Attribute Name	Description	
	State	**Description**
		persists for the specified High Duration within the High Duration Window persists for the specified High Duration within the High Duration Window persists for the specified High Duration within the High Duration Window
	🟩 Nominal	Indicates that the measured value of the metric is within the normal healthy range
	🟥 Low	*For Count-Based Threshold Configuration*: Indicates that the measured value of the metric is below the configured Low Value for the consecutive number of times specified in the Trigger Count *For Time-Based Threshold Configuration:* Indicates that the measured value of the metric is below the configured Low Value and this low value persists for the specified Low Duration within the Low Duration Window. Typically, this threshold state is applicable for metrics like Mean Opinion Score (MOS).
	⊘ Not Polled	Indicates that the metric is intentionally not polled. Some of the possible reasons are: • Performance Monitoring is notMean Opinion Score (MOS) enabled, because of current Communication Configuration settings in NNMi • The parent Node or Interface is set to Not Managed or Out of Service.
	? Unavailable	Unable to compute the metric or the computed value is outside the valid range
	? Threshold Not Set	Indicates that the threshold is not set for the metric
	⬜ None	*For Count-Based Threshold Configuration:* Indicates that the measured value of the metric is zero, and recurs for the consecutive number of times specified in the Trigger Count

<table>
<tr><th>Attribute Name</th><th>Description</th></tr>
<tr><td></td><td><table><tr><th>State</th><th>Description</th></tr><tr><td></td><td><em>For Time-Based Threshold Configuration:</em>
Indicates that the measured value of the metric is zero and this zero value persists for the specified duration within the High or Low Duration Window (depending on the metric).</td></tr></table></td></tr>
<tr><td>Action</td><td>The type of Action applied. Possible values are:
• Policing
• Shaping
• Queuing
• Packet Marking
• RED</td></tr>
<tr><td>Traffic Class Name</td><td>Name of the Traffic Class associated with the selected action</td></tr>
<tr><td>Policy Name</td><td>The name of the policy applied.</td></tr>
<tr><td>Direction</td><td>Indicates whether the policy was applied on the incoming or outgoing traffic for an interface</td></tr>
<tr><td>Interface Name</td><td>The name of the interface mapped to the CBQoS action</td></tr>
<tr><td>Hosted On Node</td><td>The name of the node on which the interface resides</td></tr>
<tr><td>Tenant</td><td>Specifies the NNMi tenant selected for the node (specified in Hosted On Node attribute)</td></tr>
<tr><td>Management Server</td><td>Specifies whether the NNMi management server is local or specifies the name of the regional manager.</td></tr>
<tr><td>Management Mode</td><td>Specifies whether the source node is managed or not
Possible states are as follows:
• Managed: Indicates that the node is managed.
• Not Managed: Indicates that the node is not managed on purpose.
• Out of Service: Indicates that a node is unavailable because it is out of service.</td></tr>
</table>

You can filter the CBQoS actions listed in this view based on all columns except the Traffic Class Name column.

The default time interval to refresh is 300 seconds, or 5 minutes.

To view a selected CBQoS Action:

1. In the CBQoS Actions Inventory View, select a CBQoS action.
2. Click **Open**.
3. In the CBQoS Action form, you can view the following information on the selected action:
   - Interface: This tab displays the interface on which the action is configured. Select the interface and click **Open** to open the CBQoS Interfaces Inventory View for the selected interface.
   - CBQoS Policies: This tab displays the policy that is associated with the action. . Select a policy and click **Open** to open the CBQoS Policies Inventory View for the selected policy

The Analysis panel of the CBQoS Action view displays the Threshold States tab. This tab displays the details about the states of the thresholds configured on the interface. For more information about the Threshold States tab, see Threshold States Tab (Analysis Panel).

CBQoS Actions Form: Interface Tab

The **Interface** tab displays information on the interfaces for which the selected CBQoS action is configured.

Attributes: Interface Tab

Attribute	Description
Interface Name	The name of interface
Hosted On Node	The name of the node on which the interface resides
In Policy	The name of the **In policy**[1] associated with the interface.
Out Policy	The name of the **Out policy**[2] associated with the interface.
Applied On	The interface on which the policy is applied. Possible values are: • Control Plane • Interface
Management Server	Specifies whether the NNMi management server is local or specifies the name of the regional manager.

Class Based Quality of Service (CBQoS) Actions

The CBQoS actions are listed below:

Traffic Queuing

[1] In Policy defines the policy which is applied to the incoming traffic.
[2] Out Policy defines the policy which is applied to the outgoing traffic.

The Queuing action is required only when the interface is busy. Typical queuing is based on the First in First Out (FIFO) principle wherein the packet that has been waiting for the longest period is transmitted first. This results in a tail drop once the queue is full. So, to override this, you can specify the queuing algorithm which is the deciding factor to determine which packet must be transmitted first in the queue. There are several queuing strategies, such as WFQ, Random Early Detector (RED), priority, and custom queuing. You can also specify the bandwidth allotted, and the maximum allowed queue size for the traffic class.

Traffic Policing

Traffic Policing is the process of dropping or discarding packets in a traffic stream, with accordance to the corresponding meter, which enforces a traffic flow.

Traffic Shaping

Traffic Shaping is the process of delaying the packet within a traffic stream, in order to conform some of the defined traffic profiles / flows. You can specify the committed traffic-shaping rate, burst size, excess burst size, adaptive traffic shaping rate (if enabled) and the limit type (peak rate / average rate).

Traffic Marking

Traffic Marking involves setting or changing one or more attributes of the traffic that belongs to a specific traffic class. Traffic Marking can be defined as the process of setting a Differentiated Services (DS) code point on a packet, in accordance to the defined rules.

RED

Random Early Detect (RED) is also known as random early drop or random early discard. RED mechanism can be applied on network components, to ensure better results during the network congestion. During a network congestion, a network component (example: Router) buffers maximum packets, and drops other packets, which cannot be buffered. RED mechanism estimates the average queue size and decides which packets are to be dropped. By using the RED algorithm, it is ensured that all important packets reach the destination.

CBQoS Actions Form: CBQoS Policies Tab

The **CBQoS Policies** tab displays information on the interfaces and CBQoS policies mapped to the selected CBQoS action.

Attributes: CBQoS Policies Tab

Attribute	Description
Policy Name	The name of the policy mapped to the selected CBQoS action To view the interfaces and traffic classes associated with the selected policy, click **Open** after selecting a policy.

Attribute	Description
	To view the CBQoS class map details for the selected traffic class, select a traffic class in the Traffic Class tab of the CBQoS Policy form, and click 📂 **Open**. The CBQoS Class Map form does not display the details for nested classes.
Applied on Interfaces	The total number of interfaces to which the selected CBQoS policy is mapped
Policing	Indicates that the "Policing" action is configured for one or more traffic classes associated with the selected policy
Shaping	Indicates that the "Shaping" action is configured for one or more traffic classes associated with the selected policy
Queuing	Indicates that the "Queuing" action is configured for one or more traffic classes associated with the selected policy
Packet Marking	Indicates that the "Packet Marking" action is configured for one or more traffic classes associated with the selected policy
RED	Indicates that the "RED" action is configured for one or more traffic classes associated with the selected policy
Management Server	Specifies whether the NNMi management server is local or specifies the name of the regional manager.

Accessing the CBQoS Interfaces Threshold Exceptions Inventory View

CBQoS Interfaces Threshold Exceptions inventory view enables you to view the list of CBQoS interfaces for which any of the following actions crossed the threshold and NNM iSPI Performance for QA raised an exception:

- Class State
- Packet Marking
- Policing
- Queuing
- Shaping
- RED

For information on each of these actions, see CBQoS Actions

To launch the CBQoS Interfaces Threshold Exceptions inventory view:

1. Log on to NNMi console using your username and password.
2. Click **Quality Assurance** in the Workspaces panel.

3. Click **CBQoS Interfaces Threshold Exceptions** to view the CBQoS interfaces that crossed the threshold for an action.

The CBQoS Threshold Exceptions Interfaces Inventory view displays the following key attributes

Attribute Name	Description
Interface Name	The name of interface
Hosted on Node	The name of the node on which the interface resides
Policy Name	The name of the policy applied on the selected interface By default, this attribute displays only the **parent policy**[1] name.
Direction	Indicates the policy applied on the incoming or outgoing traffic for the selected interface.
Traffic Class Name	Name of an associated Traffic Class, based on a specific criterion.
Class State	The threshold state for the thresholds configured on the traffic class
Packet Marking	Indicates the threshold state for the "Packet Marking" action configured for one or more traffic classes associated with the selected policy
Policing	Indicates the threshold state for the "Policing" action configured for one or more traffic classes associated with the selected policy
Queuing	Indicates the threshold state for the "Queuing" action configured for one or more traffic classes associated with the selected policy
Shaping	Indicates the threshold state for the "Shaping" action configured for one or more traffic classes associated with the selected policy
RED	Indicates the threshold state for the "RED" action configured for one or more traffic classes associated with the selected policy
Tenant	Indicates the NNMi tenant selected for the node (specified in Hosted On Node attribute)

The actions and class states show the following threshold states:

[1] The policy that contains references to other policy configurations. NNM iSPI Performance for QA displays only one hierarchical level for policies. For example, Policy1 contains references for Policy2 and NNM iSPI Performance for QA considers Policy2 as the child policy of Policy1. If Policy2 contains references to Policy3, the inventory views do not display Policy3 as a child of Policy1. NNM iSPI Performance for QA does not support hierarchical policies in Global Network Management environment.

Threshold States

State	Description
High	*For Count-Based Threshold Configuration:* Indicates that the measured value of the metric is above the configured High Value and recurs for the consecutive number of times specified in the Trigger Count *For Time-Based Threshold Configuration:* Indicates that the measured value of the metric is above the configured High Value and this high value persists for the specified High Duration within the High Duration Window
Nominal	Indicates that the measured value of the metric is within the normal healthy range
Low	*For Count-Based Threshold Configuration*: Indicates that the measured value of the metric is below the configured Low Value for the consecutive number of times specified in the Trigger Count *For Time-Based Threshold Configuration:* Indicates that the measured value of the metric is below the configured Low Value and this low value persists for the specified Low Duration within the Low Duration Window. Typically, this threshold state is applicable for metrics like Mean Opinion Score (MOS).
Not Polled	Indicates that the metric is intentionally not polled. Some of the possible reasons are: • Performance Monitoring is notMean Opinion Score (MOS) enabled, because of current Communication Configuration settings in NNMi • The parent Node or Interface is set to Not Managed or Out of Service.
? Unavailable	Unable to compute the metric or the computed value is outside the valid range
Threshold Not Set	Indicates that the threshold is not set for the metric
None	*For Count-Based Threshold Configuration:* Indicates that the measured value of the metric is zero, and recurs for the consecutive number of times specified in the Trigger Count *For Time-Based Threshold Configuration:* Indicates that the measured value of the metric is zero and this zero value persists for the specified duration within the High or Low Duration Window (depending on the metric).

The view shows threshold states for the traffic class and four different actions: Packet Marking, Policing, Queuing, Shaping, and RED. An interface appears in this view if at least one of the above thresholds is violated for the interface.

To open the CBQoS Interface inventory view for an interface, select the interface and click **Open**. For information on CBQoS Interface inventory view, see Accessing the CBQoS Interfaces Inventory View.

You can filter the interfaces listed in this view based on all columns of this view.

Accessing the CBQoS Threshold Exceptions Actions Inventory View

CBQoS Threshold Exceptions Actions inventory view enables you to view the list of CBQoS actions that crossed the threshold and NNM iSPI Performance for QA raised an exception.

For information on each of the actions, see CBQoS Actions

To launch the CBQoS Threshold Exceptions Actions Inventory view:

1. Log on to NNMi console using your username and password.
2. Click **Quality Assurance** in the Workspaces panel.
3. Click **CBQoS Threshold Exceptions Actions** to view the CBQoS actions that crossed the threshold.

The CBQoS Threshold Exceptions Actions Inventory view displays the following key attributes

<table>
<tr><th>Attribute Name</th><th>Description</th></tr>
<tr><td>State</td><td>The threshold state for the action
Can be any of the following values:
<b>Threshold States</b>
<table>
<tr><th>State</th><th>Description</th></tr>
<tr><td>High</td><td><i>For Count-Based Threshold Configuration:</i>
Indicates that the measured value of the metric is above the configured High Value and recurs for the consecutive number of times specified in the Trigger Count
<i>For Time-Based Threshold Configuration:</i>
Indicates that the measured value of the metric is above the</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Attribute Name</th><th>Description</th></tr>
<tr><td></td><td>
<table>
<tr><th>State</th><th>Description</th></tr>
<tr><td></td><td>configured High Value and this high value persists for the specified High Duration within the High Duration Window
configured High Value and this high value persists for the specified High Duration within the High Duration Window
configured High Value and this high value persists for the specified High Duration within the High Duration Window</td></tr>
<tr><td>Nominal</td><td>Indicates that the measured value of the metric is within the normal healthy range</td></tr>
<tr><td>Low</td><td><i>For Count-Based Threshold Configuration</i>:
Indicates that the measured value of the metric is below the configured Low Value for the consecutive number of times specified in the Trigger Count
<i>For Time-Based Threshold Configuration:</i>
Indicates that the measured value of the metric is below the configured Low Value and this low value persists for the specified Low Duration within the Low Duration Window.
Typically, this threshold state is applicable for metrics like Mean Opinion Score (MOS).</td></tr>
<tr><td>Not Polled</td><td>Indicates that the metric is intentionally not polled.
Some of the possible reasons are:
• Performance Monitoring is notMean Opinion Score (MOS) enabled, because of current Communication Configuration settings in NNMi
• The parent Node or Interface is set to Not Managed or Out of Service.</td></tr>
<tr><td>? Unavailable</td><td>Unable to compute the metric or the computed value is outside the valid range</td></tr>
<tr><td>?</td><td>Indicates that the threshold is not set for the metric</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Attribute Name</th><th>Description</th></tr>
<tr><td></td><td>
<table>
<tr><th>State</th><th>Description</th></tr>
<tr><td>Threshold Not Set Threshold Not Set Threshold Not Set</td><td></td></tr>
<tr><td>▯ None</td><td><em>For Count-Based Threshold Configuration:</em>
Indicates that the measured value of the metric is zero, and recurs for the consecutive number of times specified in the Trigger Count
<em>For Time-Based Threshold Configuration:</em>
Indicates that the measured value of the metric is zero and this zero value persists for the specified duration within the High or Low Duration Window (depending on the metric).</td></tr>
</table>
</td></tr>
<tr><td>Action</td><td>The name of the action that crossed the threshold</td></tr>
<tr><td>Traffic Class Name</td><td>Name of an Traffic Class associated with the selected action</td></tr>
<tr><td>Policy Name</td><td>The name of the policy associated with the selected action
By default, this attribute displays only the <strong>parent policy</strong>[1] name.</td></tr>
<tr><td>Direction</td><td>Indicates the policy applied on the incoming or outgoing traffic for the selected interface.</td></tr>
<tr><td>Interface Name</td><td>The name of the interface associated with the selected action</td></tr>
<tr><td>Hosted on Node</td><td>The name of the node on which the interface resides</td></tr>
</table>

[1] The policy that contains references to other policy configurations. NNM iSPI Performance for QA displays only one hierarchical level for policies. For example, Policy1 contains references for Policy2 and NNM iSPI Performance for QA considers Policy2 as the child policy of Policy1. If Policy2 contains references to Policy3, the inventory views do not display Policy3 as a child of Policy1. NNM iSPI Performance for QA does not support hierarchical policies in Global Network Management environment.

Attribute Name	Description
Tenant	Specifies the NNMi tenant selected for the node (specified in Hosted On Node attribute)
Management Server	Specifies whether the NNMi management server is local or specifies the name of the regional manager.
Management Mode	Specifies whether the source node is managed or not Possible states are as follows: • Managed: Indicates that the node is managed. • Not Managed: Indicates that the node is not managed on purpose. • Out of Service: Indicates that a node is unavailable because it is out of service.

The actions shows any of the following threshold states:

Threshold States

State	Description
High	*For Count-Based Threshold Configuration:* Indicates that the measured value of the metric is above the configured High Value and recurs for the consecutive number of times specified in the Trigger Count *For Time-Based Threshold Configuration:* Indicates that the measured value of the metric is above the configured High Value and this high value persists for the specified High Duration within the High Duration Window
Nominal	Indicates that the measured value of the metric is within the normal healthy range
Low	*For Count-Based Threshold Configuration*: Indicates that the measured value of the metric is below the configured Low Value for the consecutive number of times specified in the Trigger Count *For Time-Based Threshold Configuration:* Indicates that the measured value of the metric is below the configured Low Value and this low value persists for the specified Low Duration within the Low Duration Window. Typically, this threshold state is applicable for metrics like Mean Opinion Score (MOS).
Not Polled	Indicates that the metric is intentionally not polled. Some of the possible reasons are:

State	Description
	- Performance Monitoring is notMean Opinion Score (MOS) enabled, because of current Communication Configuration settings in NNMi - The parent Node or Interface is set to Not Managed or Out of Service.
? Unavailable	Unable to compute the metric or the computed value is outside the valid range
? Threshold Not Set	Indicates that the threshold is not set for the metric
None	*For Count-Based Threshold Configuration:* Indicates that the measured value of the metric is zero, and recurs for the consecutive number of times specified in the Trigger Count *For Time-Based Threshold Configuration:* Indicates that the measured value of the metric is zero and this zero value persists for the specified duration within the High or Low Duration Window (depending on the metric).

To open the CBQoS Action inventory view for an interface, select the interface and click **Open**. For information on CBQoS Action inventory view, see Accessing the CBQoS Actions Inventory View.

You can filter the actions listed in this view based on all columns of this view.

NNM iSPI Performance for QA CBQoS Class Map Form

Displays the name of a Traffic Class mapped to the policy

Click **Lookup** for the In Policy and the Out Policy fields to view information on the policies associated with the traffic class.

To view the CBQoS Class Details for the selected traffic class, follow these steps:

1. Click **Lookup** for the In Policy or Out Policy fields.
2. Select **Open** to open the CBQoS Policy form.
3. Select **Traffic Classes** tab, select a traffic class and click **Open** to open the CBQoS Class Map form. This form displays the action definitions associated with a class.

   For example, if the queuing action is configured for Class A, the CBQoS Class Map form displays a tab for queuing action. The tab displays the properties and the value for each property. The values for these properties are measured in bits per second (bps).

This form does not display the details for nested classes.

Incident Types Supported by NNM iSPI Performance for QA

NNM iSPI Performance for QA supports the following incident types:

Metric Name	Measurement	Management Incident Name	Severity
Pre Policy Bit Rate	Kbps	PrePolicyBitRateHigh	Warning
Post Policy bit Rate	Kbps	PostPolicyBitRateHigh	Warning
% of Dropped Packets	Percentage	PacketDropForClassHigh	Major
% of Exceeded Packets	Percentage	PacketsExceedingPolicedRate	Warning
% of Violated Packets	Percentage	PacketsViolatingPolicedRate	Major
% of Discarded Packets	Percentage	QueueDiscardPacketsHigh	Major
Queue utilization	Queue Depth/Maximum Queue Depth * 100	QueueUtilizationHigh	Major
% of Dropped Packets Shaping	Percentage	ShapeDroppedPacketsHigh	Warning
% of Delayed Packets Shaping	Percentage	ShapedDelayedPacketsHigh	Warning
% of Tail Drop	Percentage	REDTailDropPacketsHigh	Major
% of Random Drop	Percentage	REDDropPacketsHigh	Major
PacketsMarkedDSCPHigh	Percentage	PacketsMarkedDSCPHigh	Warning
PacketsMarkedFRDEHigh	Percentage	PacketsMarkedFRDEHigh	Warning
PacketsMarkedIPPrecedenceHigh	Percentage	PacketsMarkedIPPrecedenceHigh	Warning

Measuring Ping Latency Between a Router and a Node

The NNM iSPI Performance for QA enables you to measure the connectivity between a router and another node on your network with the help of ping requests. Using a configuration file provided by the NNM iSPI Performance for QA, you can define a router-node pair to trigger ping requests from the router to the node. The NNM iSPI Performance for QA initiates ping requests originating from a source router to a destination node (defined by a router-node pair or a **ping latency pair**[1]), collects the statistics of the ping from the router, and displays the statistics, such as round-trip time (RTT) and packet loss details, in the Ping Latency Pairs inventory view.

Note: The Ping Latency Pair feature works only with Cisco routers.

The NNM iSPI Performance for QA collects the ping statistics from the router immediately after a response for the ping request arrives. If the ping request for a router-node pair fails, the NNM iSPI Performance for QA generates an incident. The incident is closed automatically when the ping request for the router-node pair is successful.

[1] A router-node pair used by the NNM iSPI Peformance for QA to measure and monitor the connectivity between the router and the node. The router-node pair definition must be available in a configuration file provided by the NNM iSPI Peformance for QA.

To use this feature, you must configure ping pairs by defining source routers and destinations nodes in the `PingPair.conf` file (see " Configuring Ping Latency Pairs " (on page 287)). You can also modify the default size and frequency of ping requests if you have administrator's or root access to the NNMi management server (see "Configure Default Ping Attributes" (on page 290)).

Accessing the Ping Latency Pairs Inventory View

The Ping Latency Pairs inventory view enables you to view the list of configured **ping latency pair**[1]s on the network.

To launch the Ping Latency Pair Inventory view:

1. Log on to the NNMi console using your user name and password.
2. Click **Quality Assurance** in the Workspaces panel.
3. Click **Ping Latency Pairs** to view the discovered ping pair nodes in the network.

Key Attributes of the Ping Latency Pair Inventory View

The Ping Latency Pairs Inventory view displays the following key attributes

Attribute Name	Description
Status	The status of the configured ping pair. NNM iSPI Performance for QA calculates the status based on the polling status of the ping pair nodes and the threshold states. The status can be any one of the following: • ✓ Normal • ✖ Critical • ⊘ No Status
Name	This is a combination of the FQDN of the source router and IP address of the destination node. This attribute appears in the following format: *<Source_FQDN>_<Destination_IP>*
Source	The name of the source node
Source IP	The IP address of the source node
Destination	The name of the destination node
Destination IP	The IP address of the destination node
Manager	Specifies whether the NNMi management server is Local or specifies the name of the Regional Manager

Analysis Pane

[1] A router-node pair used by the NNM iSPI Peformance for QA to measure and monitor the connectivity between the router and the node. The router-node pair definition must be available in a configuration file provided by the NNM iSPI Peformance for QA.

The Analysis pane for the selected Ping Latency Pair shows the following details:

Attributes	Description
Ping Pair Details Summary	Denotes the status of the selected Ping Pair. The status can be any one of the following: • ✓ Normal • ✖ Critical • ⊘ No Status
Name	The name of the ping pair that you provide during the configuration

The **Latest Polled Values** panel shows the RTT (ms) value and Interface utilization (%) of the source interface for every status poll.

Performance Tab

The **Performance** tab enables you to analyze the performance faults for the selected ping pair with the help of graphs. The graph shows the following information:

- RTT value of the selected ping pair
- Reachability of the selected ping pair
- Packet loss of the selected ping pair

You can easily monitor and analyze the performance of the ping pair from the color of the status. Whenever any problem arises, you can view the status in the **Performance** tab. The status of the ping pair enables you to easily determine the root cause of the fault.

The following table indicates the status information:

Ping Pair Status	Status color indicating in the graph
Nominal	🟩 Normal
High, Low	🟧 Major
Critical	🟥 Critical
No status	▢ No Status
Unavailable, Unknown	🟦 Unknown
Not Polled, Threshold not set, Not defined	⬜ Disabled

Ping Latency Pair Form

The Ping Latency Pair Form view displays the details of a selected configured ping pair node.The following are the details of the selected configured ping pair node:

Ping Pair Details

Details	Description
Name	This is a combination of the FQDN of the source router and IP address of the destination node. This attribute appears in the following format: *<Source_FQDN>_<Destination_IP>*
Status	The status of the configured ping pair. The status can be any one of the following: • ✓ Normal • ⊗ Critical • ⊘ No Status

Source Details

Details	Description
Source	The name of the source node
Source IP	The IP address of the source node
Source Interface	The interface name on which the source node resides

Destination Details

Details	Description
Destination	The name of the destination node
Destination IP	The IP address of the destination node
Destination Interface	The interface name on which the destination node resides

Source Proxy Details

Details	Description
Node Name	The name of the proxy source node
IP Address	The IP address of the proxy source node

Accessing the QA Groups Inventory View

> **Tip:** See "QA Groups" (on page 275) for more details about QA groups.

The QA Groups inventory view enables you to view the list of QA Groups with QA probes and QA Groups with CBQoS probes, which are discovered in the network.

To launch the QA Groups Inventory View:

1. Log on to NNMi console using your username and password.
2. Click **Quality Assurance** in the Workspaces panel.
3. Click **QA Groups** to view the list of QA Groups with QA probes and QA Groups with CBQoS probes that are discovered in the network.

Key Attributes of the QA Groups Inventory View

The QA Groups Inventory view displays the following key attributes:

Attribute Name	Description
Group Name	The name of the QA group
Group Type	The type of the QA group. The QA group type can be QA Probes or CBQoS
Member count	The total number of QA Probes or CBQoS probes that are included in the QA group
Tenant	Specifies the NNMi tenant for the QA Group
Notes	Denotes any additional information, related to the QA group

The default time interval to refresh is 300 seconds, or 5 minutes.

QA Groups Form

The QA Groups form provides the details of the selected QA group. For QA Probes type of groups, this form also provides details about each QA probe that belongs to the group.

In the QA Group form of the QA Probes type, the following tabs are available:

- "QA Groups Form: Probes Tab" (on page 111)
- "QA Groups Form: Probes Critical Tab" (on page 114)
- " QA Groups Form View: Probes Threshold Exception Tab" (on page 114)
- "QA Groups Form: Probes Baseline Exceptions Tab" (on page 118)
- "QA Groups Form: Registration Tab" (on page 121)

In the QA Group form of the CBQoS type, the following tabs are available:

- "QA Groups Form: CBQoS"
- "QA Groups Form: CBQoS Interfaces Tab" (on page 121)
- "QA Groups Form: CBQoS Actions Threshold Exceptions Tab" (on page 125)
- "QA Groups Form: CBQoS Interfaces Threshold Exceptions Tab" (on page 123)
- "QA Groups Form: CBQoS Actions Tab" (on page 122)

QA Groups Form: Probes Tab

The **Probes** tab enables you to view the list of configured and discovered QA probes that belong to the QA group.

Key Attributes of the QA Groups- Probes Tab

The **probes** tab displays the following key attributes:

Attribute Name	Description
Status	The status that the QA probe returned. The status that the QA probe returned. NNM iSPI Performance for QA calculates the status based on the polling status of the nodes and the threshold states. A QA probe may return any of the following statuses : - ✓ Normal - ▲ Warning - ▼ Major - ✖ Critical - ? Unknown - ▨ Disabled - ▣ Not Polled - ⊘ No Status For more information on status, see the topic QA Probe Status
Name	The name of the discovered QA probe configured in the network device
Owner	The name of the discovered QA probe's owner.
Service	The type of the discovered QA probe Some of the QA probe types that the HP Network Node Manager iSPI Performance for Quality Assurance Software recognizes are as follows: - **UDP Echo** - **ICMP Echo** - **UDP** - **TCP Connect** - **VoIP**
Source	The source device in which the probe is configured
Destination	The destination network device till which the probe is configured
Source Site	The source site to which the configured probe is associated.
Destination Site	The destination site to which the configured probe is associated.
RTT	The round-trip time used by the selected QA probe

Attribute Name	Description
	Displays any one of the following threshold states for the metric High Nominal Low Not Polled Unavailable Threshold Not Set None
Jitter	The **delay**[1] variance for a data packet to reach the destination device or site Displays any one of the following threshold states for the metric High Nominal Low Not Polled Unavailable Threshold Not Set None
PL (Packet Loss)	The percentage of packets that failed to arrive at the destination. Displays any one of the following threshold states for the metric High Nominal Low Not Polled Unavailable Threshold Not Set None

[1] The time taken for a packet to travel from the sender network element to the receiver network element.

Attribute Name	Description
Manager	Specifies whether the NNMi management server is Local or specifies the name of the Regional Manager.
Tenant	Specifies the NNMi tenant selected for the network device

QA Groups Form: Probes Critical Tab

The **Probes Critical** tab displays the list of critical QA probes that belong to the QA Group.

Attributes: Probes Critical Tab

The **probes critical** tab displays the following key attributes:

Attribute Name	Description
Operational State	Operational State condition returned by the critical QA probe The QA probe status is derived from the SNMP polling results for Operational State, as well as from any conclusion.
Administrative State	Administrative State condition returned by the QA probe The QA probe status is derived from the SNMP polling results for Administrative State, as well as from any conclusion.
Name	The name of the discovered QA probe configured in the network device.
Owner	The name of the discovered QA probe's owner.
Service	The type of the discovered QA probe. Some of the QA probe types that the HP Network Node Manager iSPI Performance for Quality Assurance Software recognizes are as follows: • UDP Echo • ICMP Echo • UDP • TCP Connect • VoIP
Source	The source device from which the data packet is sent.
Source Tenant	Specifies the NNMi tenant selected for the network device

QA Groups Form View: Probes Threshold Exception Tab

The **Probes Threshold Exception** tab enables you to view the QA Probes that belong to the QA Group, and have violated the threshold for any one or more of the metrics.

Key Attributes of the Probes Threshold Exception Tab:

Attribute Name	Description
Status	Displays the QA probes of the following status: - Warning - Major - Critical
Name	The name of the discovered QA probe configured in the network device.
Service	The type of the discovered QA probe. Some of the QA probe types that the HP Network Node Manager iSPI Performance for Quality Assurance Software recognizes are as follows: - UDP Echo - ICMP Echo - UDP - TCP Connect - VoIP
Manager	Specifies whether the NNMi management server is Local or specifies the name of the Regional Manager.
RTT	The round-trip time used by the selected QA probe. Displays any one of the following threshold states for the metric High Nominal Low Not Polled Unavailable Threshold Not Set None
Jitter	The **delay**[1] variance for a data packet to reach the destination device or site. Displays any one of the following threshold states for the metric High

[1] The time taken for a packet to travel from the sender network element to the receiver network element.

Attribute Name	Description
	Nominal Low Not Polled Unavailable Threshold Not Set None
+ve Jitter SD	Indicates the threshold state of the positive jitter from the source to the destination Displays any one of the following threshold states for the metric High Nominal Low Not Polled Unavailable Threshold Not Set None
+ve Jitter DS	Indicates the threshold state of the positive jitter from the destination to the source Displays any one of the following threshold states for the metric High Nominal Low Not Polled Unavailable Threshold Not Set None
-ve Jitter SD	Indicates the threshold state of the negative jitter from the source to the destination Displays any one of the following threshold states for the metric High

Attribute Name	Description
	Nominal Low Not Polled Unavailable Threshold Not Set None
-ve Jitter DS	Indicates the threshold state of the negative jitter from the destination to the source Displays any one of the following threshold states for the metric High Nominal Low Not Polled Unavailable Threshold Not Set None
PL (Packet Loss)	The percentage of packets that failed to arrive at the destination. Displays any one of the following threshold states for the metric High Nominal Low Not Polled Unavailable Threshold Not Set None
Packet Loss SD	Indicates the threshold state of the percentage of packet loss from the source to the destination. Displays any one of the following threshold states for the metric High Nominal

Attribute Name	Description
	Low Not Polled Unavailable Threshold Not Set None
Packet Loss DS	Indicates the threshold state of the percentage of packet loss from the destination to source. Displays any one of the following threshold states for the metric High Nominal Low Not Polled Unavailable Threshold Not Set
MOS	Indicates the threshold state of the **Mean Opinion Score (MOS)** of the jitter.
Source Tenant	Specifies the NNMi tenant selected for the network device

QA Groups Form: Probes Baseline Exceptions Tab

The **Probes Baseline Exceptions** tab displays the list of QA probes that belong to the QA Group, and have the baseline state as Abnormal Range, Unavailable, No Policy, or Not Polled for any one or more of the following metrics:

- RTT
- Two Way Jitter
- Two Way Packet Loss
- MOS

Each probe displays information for a specific time interval.

Key Attributes of the Baseline Exceptions Probes tab

Attribute Name	Description
Status	Displays the QA probes of the following status:

Attribute Name	Description
	- Normal - Warning - Major - Critical - Unknown - Disabled - Not Polled - No Status For more information on status, see the topic [QA Probe Status]
Name	The name of the discovered QA probe configured in the network device.
Service	The type of the discovered QA probe. Some of the QA probe types that the HP Network Node Manager iSPI Performance for Quality Assurance Software recognizes are as follows: - UDP Echo - ICMP Echo - UDP - TCP Connect - VoIP
Manager	Specifies whether the NNMi management server is Local or specifies the name of the Regional Manager.
RTT	The round-trip time used by the selected QA probe. Displays any one of the following baseline states for the metric: - Normal Range - The metric is within the normal range of deviation - Abnormal Range - The metric is above the configured normal range of the deviation - Unavailable - The computed value for the metric is not found in HP NNM iSPI Performance for Metrics Software - Unset - No baseline is computed - Not polled - The metric is not polled for baseline deviations - No Policy - No polling policy exists for this metric
Two Way Jitter	Indicates two way jitter. This value is the average of the following values:

Attribute Name	Description
	• Positive jitter from the source to the destination • Negative jitter from the source to the destination • Positive jitter from the destination to the source • Negative jitter from the destination to the source Displays any one of the following baseline states for the metric: • Normal Range - The metric is within the normal range of deviation • Abnormal Range - The metric is either above or below the configured normal range of the deviation • Unavailable - The computed value for the metric is not found in HP NNM iSPI Performance for Metrics Software • Unset - No baseline is computed • Not polled - The metric is not polled for baseline deviations • No Policy - No polling policy exists for this metric
Two Way Packet Loss	The percentage of packets that failed to arrive from the source to destination and destination to source. Displays any one of the following baseline states for the metric: • Normal Range - The metric is within the normal range of deviation • Abnormal Range - The metric is either above or below the configured normal range of the deviation • Unavailable - The computed value for the metric is not found in HP NNM iSPI Performance for Metrics Software • Unset - No baseline is computed • Not polled - The metric is not polled for baseline deviations • No Policy - No polling policy exists for this metric
MOS	Indicates the baseline state of the Mean Opinion Score (MOS) of the jitter. Displays any one of the following baseline states for the metric: • Normal Range - The metric is within the normal range of deviation • Abnormal Range - The metric is either above or below the configured normal range of the deviation • Unavailable - The computed value for the metric is not found in HP NNM iSPI Performance for Metrics Software

Attribute Name	Description
	• Unset - No baseline is computed • Not polled - The metric is not polled for baseline deviations • No Policy - No polling policy exists for this metric
Source Tenant	Specifies the NNMi tenant selected for the network device

QA Groups Form: Registration Tab

The ID and UUID attributes are valid for all object types. NNMi displays the ID and UUID attribute values on the object form's **Registration** tab:

- `${uuid}` Universally Unique Object Identifier -Unique across all databases.
- `${id}` Unique Object Identifier - Unique across the Entire NNMi Database.

For more information, see *NNMi Online Help for Administrators*

QA Groups Form: CBQoS Interfaces Tab

The **CBQoS Interfaces** tab enables you to view the CBQoS QA group list of discovered interfaces, for which the CBQoS Policies are configured. The traffic can be ingress or egress for an interface.

The **CBQoS Interfaces** tab displays only the parent policies name, or only the policies name that are configured on the interfaces.

Key Attributes of the CBQoS Interfaces Tab

The **CBQoS Interfaces** tab displays the following key attributes:

Attribute Name	Description
Interface Name	The name of the interface.
Hosted on Node	The name of the node on which the interface resides.
In Policy	The name of the **In policy**[1] associated with the interface.
Out Policy	The name of the **Out policy**[2] associated with the interface.
Applied On	The interface on which the policy is applied. Possible values are:

[1] In Policy defines the policy which is applied to the incoming traffic.
[2] Out Policy defines the policy which is applied to the outgoing traffic.

Attribute Name	Description
	• Control Plane • Interface
Tenant	Specifies the NNMi tenant selected for the interface
Management Server	Specifies whether the NNMi management server is local or specifies the name of the regional manager.
Management Mode	Specifies whether the source node is managed or not Possible states are as follows: • Managed: Indicates that the node is managed. • Not Managed: Indicates that the node is not managed on purpose. • Out of Service: Indicates that a node is unavailable because it is out of service.

The default time interval to refresh is 300 seconds, or 5 minutes.

QA Groups Form: CBQoS Actions Tab

The **CBQoS Actions** tab enables you to view the list of CBQoS Actions, which are applied to the CBQoS interfaces that belong to the QA Group, based on a particular traffic flow and a policy (Incoming and Outgoing traffic).

Key Attributes of the CBQoS Actions Tab

The **CBQoS Actions** tab displays the following key attributes

Attribute Name	Description
Action	The type of Action applied. Possible values are: • Policing • Shaping • Queuing • Packet Marking • RED
Traffic Class Name	Name of the Traffic Class associated with the selected action
Policy Name	The name of the policy applied. This attribute displays only the parent policies name, or the policies that are configured on the interfaces.

Attribute Name	Description
Direction	Indicates whether the policy was applied on the incoming or outgoing traffic for an interface
Interface Name	The name of the interface mapped to the CBQoS action
Hosted On Node	The name of the node on which the interface resides
Tenant	Specifies the NNMi tenant selected for the interface
Management Server	Specifies whether the NNMi management server is local or specifies the name of the regional manager
Management Mode	Specifies whether the source node is managed or not Possible states are as follows: • Managed: Indicates that the node is managed. • Not Managed: Indicates that the node is not managed on purpose. • Out of Service: Indicates that a node is unavailable because it is out of service.

The default time interval to refresh is 300 seconds, or 5 minutes.

QA Groups Form: CBQoS Interfaces Threshold Exceptions Tab

The **CBQoS Interfaces Threshold Exceptions** tab enables you to view the list of CBQoS interfaces that belong to the QA Group, for which any of the following actions crossed the threshold and NNM iSPI Performance for QA raised an exception:

- Class State
- Packet Marking
- Policing
- Queuing
- Shaping
- RED

For information on each of these actions, see CBQoS Actions

The **CBQoS Interfaces Threshold Exceptions** tab displays the following key attributes:

Attribute Name	Description
Interface Name	The name of interface
Hosted on Node	The name of the node on which the interface resides

Attribute Name	Description
Policy Name	The name of the policy applied on the selected interface. It displays only the parent policies name, or only the policies name that are configured on the interfaces.
Direction	Indicates the policy applied on the incoming or outgoing traffic for the selected interface.
Traffic Class Name	Name of an associated Traffic Class, based on a specific criterion.
Class State	Specifies the traffic class state.
Packet Marking	Specifies the threshold state for the "Packet Marking" action configured for one or more traffic classes associated with the selected policy
Policing	Specifies the threshold state for the "Policing" action configured for one or more traffic classes associated with the selected policy
Queuing	Specifies the threshold state for the "Queuing" action configured for one or more traffic classes associated with the selected policy
Shaping	Specifies the threshold state for the "Shaping" action configured for one or more traffic classes associated with the selected policy
RED	Specifies the threshold state for the "RED" action configured for one or more traffic classes associated with the selected policy
Tenant	Specifies the NNMi tenant selected for the interface

The actions shows any of the following threshold states:

Threshold States

State	Description
🟥 High	*For Count-Based Threshold Configuration:* Indicates that the measured value of the metric is above the configured High Value and recurs for the consecutive number of times specified in the Trigger Count *For Time-Based Threshold Configuration:* Indicates that the measured value of the metric is above the configured High Value and this high value persists for the specified High Duration within the High Duration Window
🟩 Nominal	Indicates that the measured value of the metric is within the normal healthy range
🟥 Low	*For Count-Based Threshold Configuration*: Indicates that the measured value of the metric is below the configured Low Value for the consecutive number of times specified in the Trigger Count

State	Description
	For Time-Based Threshold Configuration: Indicates that the measured value of the metric is below the configured Low Value and this low value persists for the specified Low Duration within the Low Duration Window. Typically, this threshold state is applicable for metrics like Mean Opinion Score (MOS).
Not Polled	Indicates that the metric is intentionally not polled. Some of the possible reasons are: • Performance Monitoring is notMean Opinion Score (MOS) enabled, because of current Communication Configuration settings in NNMi • The parent Node or Interface is set to Not Managed or Out of Service.
? Unavailable	Unable to compute the metric or the computed value is outside the valid range
Threshold Not Set	Indicates that the threshold is not set for the metric
None	*For Count-Based Threshold Configuration:* Indicates that the measured value of the metric is zero, and recurs for the consecutive number of times specified in the Trigger Count *For Time-Based Threshold Configuration:* Indicates that the measured value of the metric is zero and this zero value persists for the specified duration within the High or Low Duration Window (depending on the metric).

QA Groups Form: CBQoS Actions Threshold Exceptions Tab

The **CBQoS Actions Threshold Exceptions** tab enables you to view the list of CBQoS actions that crossed the threshold and NNM iSPI Performance for QA raised an exception.

For information on each of the actions, see CBQoS Actions

The **CBQoS Actions Threshold Exceptions** tab displays the following key attributes:

Attribute Name	Description
State	The threshold state for the action Can be any of the following values:

Attribute Name	Description
	Threshold States

State	Description
High	*For Count-Based Threshold Configuration:* Indicates that the measured value of the metric is above the configured High Value and recurs for the consecutive number of times specified in the Trigger Count *For Time-Based Threshold Configuration:* Indicates that the measured value of the metric is above the configured High Value and this high value persists for the specified High Duration within the High Duration Window
Nominal	Indicates that the measured value of the metric is within the normal healthy range
Low	*For Count-Based Threshold Configuration*: Indicates that the measured value of the metric is below the configured Low Value for the consecutive number of times specified in the Trigger Count *For Time-Based Threshold Configuration:* Indicates that the measured value of the metric is below the configured Low Value and this low value persists for the specified Low Duration within the Low Duration Window. Typically, this threshold state is applicable for metrics like Mean Opinion Score (MOS).
Not Polled	Indicates that the metric is intentionally not polled. Some of the possible reasons are: • Performance Monitoring is notMean Opinion Score (MOS) enabled, because of current Communication Configuration settings in NNMi • The parent Node or Interface is set to Not Managed or Out of Service.
? Unavailable	Unable to compute the metric or the computed value is outside the valid range
? Threshold Not Set	Indicates that the threshold is not set for the metric
None	*For Count-Based Threshold Configuration:*

<table>
<tr><th>Attribute Name</th><th>Description</th></tr>
<tr><td></td><td><table><tr><th>State</th><th>Description</th></tr><tr><td></td><td>Indicates that the measured value of the metric is zero, and recurs for the consecutive number of times specified in the Trigger Count
<i>For Time-Based Threshold Configuration:</i>
Indicates that the measured value of the metric is zero and this zero value persists for the specified duration within the High or Low Duration Window (depending on the metric).</td></tr></table></td></tr>
<tr><td>Action</td><td>The name of the action that crossed the threshold</td></tr>
<tr><td>Traffic Class Name</td><td>Name of an Traffic Class associated with the selected action</td></tr>
<tr><td>Policy Name</td><td>The name of the policy associated with the selected action.
This attribute displays only the parent policies name, or only the policies that are configured on the interfaces.</td></tr>
<tr><td>Direction</td><td>Indicates the policy applied on the incoming or outgoing traffic for the selected interface.</td></tr>
<tr><td>Interface Name</td><td>The name of the interface associated with the selected action</td></tr>
<tr><td>Hosted on Node</td><td>The name of the node on which the interface resides</td></tr>
<tr><td>Tenant</td><td>Specifies the NNMi tenant selected for the interface</td></tr>
<tr><td>Management Server</td><td>Specifies whether the NNMi management server is local or specifies the name of the regional manager.</td></tr>
<tr><td>Management Mode</td><td>Specifies whether the source node is managed or not
Possible states are as follows:
• Managed: Indicates that the node is managed.
• Not Managed: Indicates that the node is not managed on purpose.
• Out of Service: Indicates that a node is unavailable because it is out of service.</td></tr>
</table>

The actions shows any of the following threshold states:

Threshold States

State	Description
High	*For Count-Based Threshold Configuration:*

State	Description
	Indicates that the measured value of the metric is above the configured High Value and recurs for the consecutive number of times specified in the Trigger Count *For Time-Based Threshold Configuration:* Indicates that the measured value of the metric is above the configured High Value and this high value persists for the specified High Duration within the High Duration Window
Nominal	Indicates that the measured value of the metric is within the normal healthy range
Low	*For Count-Based Threshold Configuration*: Indicates that the measured value of the metric is below the configured Low Value for the consecutive number of times specified in the Trigger Count *For Time-Based Threshold Configuration:* Indicates that the measured value of the metric is below the configured Low Value and this low value persists for the specified Low Duration within the Low Duration Window. Typically, this threshold state is applicable for metrics like Mean Opinion Score (MOS).
Not Polled	Indicates that the metric is intentionally not polled. Some of the possible reasons are: • Performance Monitoring is notMean Opinion Score (MOS) enabled, because of current Communication Configuration settings in NNMi • The parent Node or Interface is set to Not Managed or Out of Service.
? Unavailable	Unable to compute the metric or the computed value is outside the valid range
? Threshold Not Set	Indicates that the threshold is not set for the metric
None	*For Count-Based Threshold Configuration:* Indicates that the measured value of the metric is zero, and recurs for the consecutive number of times specified in the Trigger Count *For Time-Based Threshold Configuration:* Indicates that the measured value of the metric is zero and this zero value persists for the specified duration within the High or Low Duration Window (depending on the metric).

QA Groups Form: Registration Tab

The ID and UUID attributes are valid for all object types. NNMi displays the ID and UUID attribute values on the object form's Registration tab:

- `${uuid}` Universally Unique Object Identifier -Unique across all databases.
- `${id}` Unique Object Identifier - Unique across the Entire NNMi Database.

For more information, see *NNMi Online Help for Administrators*

Analysis Pane: QA Groups

Analysis Pane

The Analysis Pane of QA Groups shows the details of the selected QA Group (QA Probes or CBQoS).

QA Probes

The analysis pane for QA Probes shows the details such as, QA Group summary, QA probes on QA groups, baseline state, and Threshold state.

QA Group Summary

The QA Group summary displays the following details about the QA Group and the probes that belong to the selected QA Group:

- Filter String
- Total number of probes
- Total number of normal probes
- Total number of disabled probes
- Total number of critical probes
- Total number of threshold exceeded probes
- Total number of baseline exceeded probes

QA Probes on QA Groups

This tab displays a pie-chart for the following QA Probes' status that belong to the selected QA Group:

- 🟩 Normal
- ■ Warning
- 🟧 Major
- 🟥 Critical
- 🟦 Unknown

- ⬜ Disabled
- 🟨 No Status

Baseline State

This tab displays a pie-chart for the following QA Probes' baseline threshold status that belong to the selected QA Group:

Threshold Status	Status indicating in the Pie-chart for the corresponding threshold status
Nominal, NOMINAL	🟩 Normal
High, Low	🟧 Major
Critical	🟥 Critical
No status	🟨 No Status
UNAVAILABLE, UNKNOWN	🟦 Unknown
NOT POLLED, Not Polled, Threshold not set, Not defined	⬜ Disabled

Threshold State

This tab displays a pie-chart for the following QA Probes' threshold status that belong to the selected QA Group:

Threshold Status	Status indicating in the Pie-chart for the corresponding threshold status
Nominal, NOMINAL	🟩 Normal
High, Low	🟧 Major
Critical	🟥 Critical
No status	🟨 No Status
UNAVAILABLE, UNKNOWN	🟦 Unknown
NOT POLLED, Not Polled, Threshold not set, Not defined	⬜ Disabled

CBQoS

The analysis pane for CBQoS probes shows the details such as, QA Group summary, Threshold Exception Interfaces, and CBQoS Actions Threshold State.

QA Group Summary

The QA Group summary displays the following details about the QA Group and the probes that belong to the selected QA Group:

- Filter string
- Total number of CBQoS interfaces
- Total number of CBQoS Actions

Threshold Exception Interfaces

This tab displays the tabular representation for all CBQoS interfaces that belong to the QA Group, which at least one of the metric thresholds is violated.

Threshold Status	Status indicating in the Pie-chart for the corresponding threshold status
Nominal, NOMINAL	🟩 Normal
High, Low	🟧 Major
Critical	🟥 Critical
No status	🟨 No Status
UNAVAILABLE, UNKNOWN	🟦 Unknown
NOT POLLED, Not Polled, Threshold not set, Not defined	⬜ Disabled

CBQoS Actions Threshold State

This tab displays a pie-chart for the following CBQoS actions threshold states that belong to the QA Group:

Threshold Status	Status indicating in the Pie-chart for the corresponding threshold status
Nominal, NOMINAL	🟩 Normal
High, Low	🟧 Major
Critical	🟥 Critical
No status	🟨 No Status
UNAVAILABLE, UNKNOWN	🟦 Unknown
NOT POLLED, Not Polled, Threshold not set, Not defined	⬜ Disabled

NNM iSPI Performance for QA QA Application Health Report

You can check the health of the NNM iSPI Performance for QA by viewing the QA Health Report.

Launching the QA Application Health Report

Select **Help** → **Help for NNM iSPIs** → **QA Application Health** from the NNMi console to check the health status of NNM iSPI Performance for QA.

The user interface displays seven tabs; Memory, CPU Usage, System, Database, Site Associations, State Poller, and GNM

The **Memory** tab contains the following information:

- Name
- Status
- Used (%)
- Maximum (MB)
- Committed (MB)

The **CPU Usage** tab displays the following information only for UNIX platforms:

- CPU Utilization
- Load Average

The **System** tab contains the following information:

- Available Processors
- Free Physical Memory
- Physical Memory
- Committed Virtual Memory
- Free Swap Space
- Total Swap Space

The **Database** tab contains the following information:

- Connections Available
- Connections in Use
- Maximum Connections Used
- Total Connections
- Maximum Connections Allowed

The **Site Associations** tab contains the following information:

- Site Associations Recompute in Progress
- Site Queue Length
- Last Recompute Started
- Last Recompute Completed

The **StatePoller** tab contains the following information:

- Collections Requested in Last 5 minutes
- Collections Completed in Last 5 minutes
- Collections in Process
- Time to Execute Skips in Last 5 minutes
- Collection Collector State Count in Last 5 minutes

The **GNM** tab contains the details of the Regional Managers configured

HP Network Node Manager iSPI Performance for Quality Assurance Software Help for Administrators

NNM iSPI Performance for QA enables you to do the following:

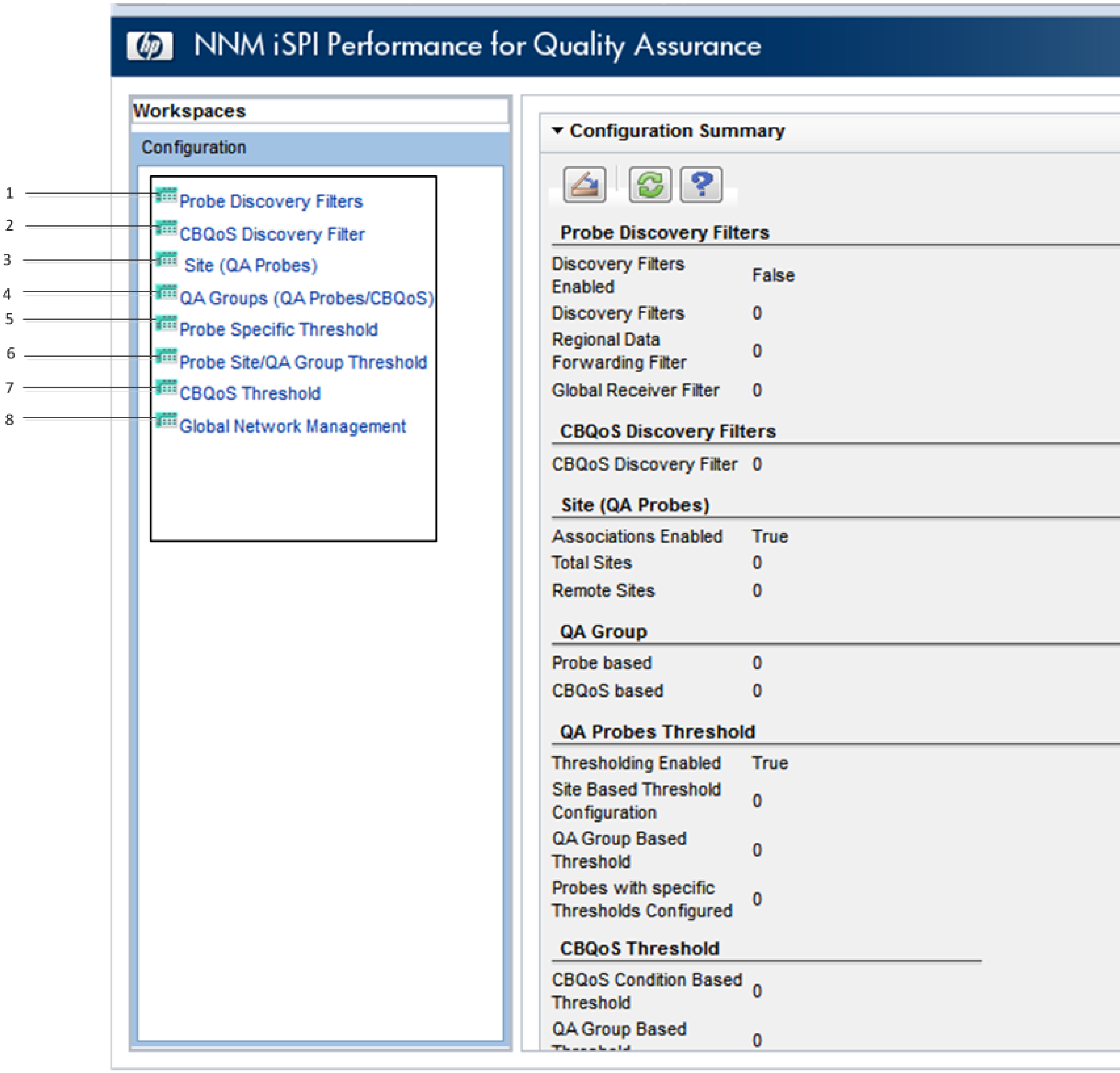
- Discover the QA probes configured in the nodes managed by NNMi
- Configure QA probes
- Configure threshold for a **Site**[1], QA probe, CBQoS element, or QA Group.
- Organize NNM iSPI Performance for QA elements (QA probes, nodes, node groups, CBQoS elements, etc) in sites based on their geographical locations.
- Organize NNM iSPI Performance for QA elements (QA probes, nodes, node groups, CBQoS elements, etc) in QA groups based on any other common attribute.
- Support the Multi-Tenancy architecture configured in NNMi. The security group and tenants configured in NNMi is also applicable for the QA probes in NNM iSPI Performance for QA. See the topic *Configuring Security* in the *NNMi Online Help* for more information on Tenants and Security Groups.

You can access the Quality Assurance Configuration Console from the Configuration workspace in NNMi to configure sites, threshold, discovery filters, and global manager. However, the following configuration tasks can be performed directly in the NNMi console:

- Probe Configuration
- Probe Maintenance
- Configure Thresholds for QA Probes and CBQoS elements

The following diagram and table explain the main tasks that the Quality Assurance workspace enables you to perform:

[1] A logical organization of networking devices. In the scope of enterprise networks, a site can be a logical grouping of networking devices generally situated in similar geographic location. The location can include a floor, building or an entire branch office or several branch offices which connect to head quarters or another branch office via WAN/MAN. Each site is uniquely identified by its name. In case of the service provider networks the Virtual Routing and Forwarding (VRF) on a Provider Edge (PE) router or a Customer Edge (CE) routers can be defined as a site.



Probe Discovery Filters

Discovery Filters Enabled	False
Discovery Filters	0
Regional Data Forwarding Filter	0
Global Receiver Filter	0

CBQoS Discovery Filters

CBQoS Discovery Filter	0

Site (QA Probes)

Associations Enabled	True
Total Sites	0
Remote Sites	0

QA Group

Probe based	0
CBQoS based	0

QA Probes Threshold

Thresholding Enabled	True
Site Based Threshold Configuration	0
QA Group Based Threshold	0
Probes with specific Thresholds Configured	0

CBQoS Threshold

CBQoS Condition Based Threshold	0
QA Group Based	0

Legend	Task
1	NNM iSPI Performance for QA Site Configuration
2	NNM iSPI Performance for QA QA Probe Threshold Configuration
3	NNM iSPI Performance for QA Threshold Configuration for QA Probes
4	NNM iSPI Performance for QA Discovery Filter Configuration

HP Network Node Manager iSPI Performance for Quality Assurance Software Quality Assurance Configuration Console

The Quality Assurance Configuration console is a separate console that contains links to user interfaces for configuring the NNM iSPI Performance for QA specific objects. Examples of objects are sites, threshold, discovery filters, and regional managers. You can do the configuration task only if you have Administrator privileges. This console also gives the configuration summary details, which displays the statistic details of the configuration.

The following configuration tasks can be performed directly in the NNMi console:

- Probe Configuration
- Probe Maintenance
- Configure Thresholds for Probes

The thresholds for probes can be edited in the Probe Specific Thresholds form in the Quality Assurance Configuration console.

Launching the Quality Assurance Configuration Console

To launch the Quality Assurance Configuration console:

1. Log on to NNMi console using your username and password.

   You must have administrator privileges.

2. From the workspace navigation panel, select the **Configuration** workspace.
3. Select **Quality Assurance Configuration Console**

   The Quality Assurance Configuration console opens.

   The following list of configuration links appear below the **Configuration** workspace in the left pane.

   - Site(QA Probes): You can configure sites for a global manager or a regional manager. By grouping the networking devices into sites, you can get an overview of the network performance
   - QA Probe Threshold Configuration: You can configure thresholds for all the configured sites and QA Groups.
   - Probe Specific Threshold: You can view the list of QA probes for which you have configured the threshold, and you can edit the probe-specific threshold if required.

- Probe Discovery Filters: You can configure a discovery filter to exclude the QA probes based on some of the attributes of the QA probe
- CBQoS Threshold: You can configure thresholds for the available CBQoS elements in your network.
- CBQoS Discovery Filter: You can configure a discovery filter to exclude the CBQoS elements based on some of the attributes of the CBQoS element.
- QA Groups (QA Probes / CBQoS): You can configure a QA Group based on a specific NNM iSPI Performance for QA entity type and assign all probes that belong to the same group.
- Global Network Management: You can configure the regional manager specific to NNM iSPI Performance for QA using this user interface in the global manager.

4. You can click on the required link in the left pane for configuration.

   The configuration summary details appear as follows:

   a. **Site**

Field Name	Description
Associations Enabled	Displays the value True if the site associations are enabled, otherwise displays the value False
Total Sites	Indicates the total number of **Local Sites**[1] and **Remote Sites**[2] configured in the NNMi management server
Remote Sites	Indicates the number of **Remote Sites**[3] configured

   b. **Threshold**

Field Name	Description
Thresholding Enabled	Displays the value True if threshold computation and association are enabled, otherwise displays the value False
Site Based Threshold Configuration	Indicates number of site based thresholds configured
Probes with Specific Thresholds Configured	Indicates number of probes based threshold configured

   c. **Discovery Filters**

Field Name	Description
Discovery Filters	Displays the value True if discovery filters is enabled,

[1] Sites configured in the local NNMi management server are referred to as Local Sites. The local sites are owned by the Manager on which it is configured.
[2] Sites exported from the regional manager to the global manager are known as Remote Sites.
[3] Sites exported from the regional manager to the global manager are known as Remote Sites.

Field Name	Description
Enabled	otherwise displays the value False
Discovery Filters	Indicates the number of discovery filters configured
Regional Data Forwarding Filter	Indicates the number of regional data forwarding filter configured
Global Receiver Filter	Indicates the number of global receiver filters configured.

d. **Global Network Management**

Field Name	Description
Regional Managers	Indicates the number of regional managers configured (if any) for the logged in NNMi management server

e. **CBQoS Discovery Filters**

Field Name	Description
CBQoS Discovery Filters	Indicates the number of CBQoS discovery filters configured

f. **CBQoS Threshold**

Field Name	Description
CBQoS Threshold	Indicates the number of CBQoS thresholds configured

3. You can perform the following actions in the Quality Assurance Configuration console:

Icons Available in the Quality Assurance Configuration Toolbar	Description
Close	Closes the Quality Assurance Configuration console
Refresh	Retrieves the last saved configuration details from the database, update the summary details and displays the data in the Quality Assurance Configuration console

Enabling Single Sign-On

To enable Single Sign-On between NNMi and the NNM iSPI Performance for QA (for easy access of the Quality Assurance Configuration Console):

1. Go to the following location on the NNMi management server:

   On Windows:

   ```
   %nnmdatadir%\shared\nnm\conf\props
   ```

On UNIX\Linux:

`/var/opt/OV/shared/nnm/conf/props`

2. Open the `nms-ui.properties` file with a text editor.
3. Make sure that the `com.hp.nms.ui.sso.isEnabled` property is set to `true`.
4. Go to the following location on the NNMi management server:

   On Windows:

   `%nnminstalldir%\qa\server\conf`

   On UNIX\Linux:

   `/opt/OV/qa/server/conf`
5. Open the `lwssofmconf.xml` file with a text editor.
6. Note down the value of the `initString` property.
7. Go to the following location on the NNMi management server:

   On Windows:

   `%nnmdatadir%\shared\nnm/conf\props`

   On UNIX\Linux:

   `/var/opt/OV/shared/nnm/conf/props`
8. Open the `nms-ui.properties` file with a text editor.
9. Make sure that the value of the `initString` property is the same as that in the `lwssofmconf.xml` file (the value that you noted down in step 3).
10. Run the following commands on the NNMi management server:
    a. **nnmsso.ovpl –reload**

    b. **nmsqassoreload.ovpl**

Configuring QA Probes

Probe configuration form enables you to do the following:

- Create a probe
  - Identify the type of test or probe to run on the node. For example, the QA probe service type, and VRF name etc.
  - Define the duration details to run the test or probe. For example, the frequency, the life time of the probe etc.
  - Optionally, define the payload details. For example, the size of the packet, inter packet delay etc.
- Create a template for probe that can be reused and associated with any source and destination node
- Deploy the probe, or save the probe details to a file and deploy at a later point of time
- View the Real Time Line graph for the metrics of QA probes that are deployed successfully

- Reconfigure the probes if the deployment for the configured probes fail
- View the probe list and template list
- View the preconfigured probes and launch the real time line graph (if required)

> **Note:** The NNM iSPI Performance for QA supports multitenant architecture. Multitenant architecture establishes a node to tenant association and determines the nodes that can be accessed by the user. However, you can configure the QA probes for a source node irrespective of whether you can access the destination node. A user with administrator privileges can configure probes.

Tasks	How
Launch the probe configuration form	Launching the probe configuration form
Configure Probes	Configuring QA Probes
Deploy Probes	Deploying QA Probes
View Deployment Status	Viewing the deployment status
View Preconfigured Probes	Viewing the preconfigured probes
Create a Template	Creating a Template
View a Probe List	Viewing a Probe List
View a Template List	Viewing a Template List

Discovering QA Probes Using nmsqadisco.ovpl Command

HP Network Node Manager iSPI Performance for Quality Assurance Software discovers the QA probes configured in the network managed by NNMi during each NNMi discovery.

Use the following command to discover the QA probes configured on the managed NNMi nodes:

```
nmsqadisco.ovpl -u <username> -p <password> [- node <nodename>] [-all]
```

Parameters

- `-u <username>`: Type the NNMi administrator username required to run the command. This is a required parameter.
- `-p <password>`: Type the NNMi administrator password required to run the command. This is a required parameter.
- `-node <nodename>`: Type the node name to initiate the discovery of QA probes on the selected node.
- `-all`: Type this parameter to initiate the discovery of QA probes on all the managed nodes.

You should use either the -node <nodename> or the -all parameter to run the command.

Configuring QA Probes Using nmsqaprobeconfig.ovpl Command

You can use `nmsqaprobeconfig.ovpl` command to configure QA probes on a node for the following test types or services:

- ICMP Echo
- UDP
- UDP Echo
- TCP Connect
- HTTP (supported by iRA only)
- HTTPS (supported by iRA only)
- Oracle (supported by iRA only)
- DNS (supported by iRA only)

Usage

For NNM iSPI Performance for QA

```
nmsqaprobeconfig.ovpl -u <username> -p <password> -c <write community
string> -n <hostname> -da <destination address> -tn <test name> -fr
<test frequency> -tt icmp_echo [-htn <Host Tenant Name> -da
<destination address>  -dp <destination port> -sa <source address>] [-
si <source interface name>] [-sp <source port>] [-vn <VRF name>] [-tos
<type of service>] [-lt <test life time in seconds>] [-to <test time
out in milliseconds>] [-ps <packet size>] [-pn <number of packets> [-
pd <inter packet delay in milliseconds>] [-ct <Cdec type>]
```

Option `-dp` is not valid for ICMP Echo.

Option `-ct` is valid only for VOIP tests.

For iRA

```
nmsqaprobeconfig.ovpl -u <username> -p <password> -c <write community
string> -n <hostname> -da <destination address> -tn <test name> -fr
<test frequency> -tt icmp_echo [-htn <Host Tenant Name> -da
<destination address> -dp <destination port> -sa <source address>] [-
si <source interface name>] [-sp <source port>] [-lt <test life time
in seconds>] [-to <test time out in milliseconds>] [-ps <packet size>]
[-pn <number of packets> [-pd <inter packet delay in milliseconds>]
```

Option `-dp` is not valid for ICMP Echo.

Parameters

- `-u <username>`: Type the username. This is a required parameter.
- `-p <password>`: Type the password. This is a required parameter.

- `-c <write community string>`: Type the write community string to use for authentication on the remote node. If you leave this field blank, the value is retrieved from NNMi.
- `-n <hostname>`: Type the hostname of the node. This is a required parameter.
- `-tn <test name>`: Type the name of the probe.This is a required parameter.
- `-tt <test type>`: Type the test type or service for which you intend to configure QA probes. This is a required parameter.
  - The valid test types for NNM iSPI Performance for QA are `icmp_echo, udp_echo, tcp_connect, udp, and voip`.
  - The valid test types for iRA are `icmp_echo, udp, tcp_connect, http, https, dns, and oracle`.
- `-fr <test frequency>`: Type the frequency at which the specific QA probe test must be repeated in seconds. This is a required parameter.
- `-htn <host tenant name>`: Type the tenant name for the host node. If you do not specify a tenant name, NNM iSPI Performance for QA uses NNMi default tenant.
- `-sa <source address>]`: Type the source address of the probe in the node.
- `-si <source interface name>`: Type the source interface name of the probe in the node.
- `-sp <source port>`: Type the source port of the probe in the node.
- `-da <destination address>`: Type the destination address of the node for which you intend to configure QA probes. This is a required parameter.
- `-dp <destination port>`: Type the destination port. This is a required parameter if you selected `udp_echo, tcp_connect, udp`, or `voip` service or test type.
- `-vn` <VRF name>: Type the name of the VRF.

  This parameter is not valid for iRA probes.
- `-tos <type of service>`: Type the type of service.

  This parameter is not valid for iRA probes.
- `-lt <test life time>:`: Type the life time of the probe in seconds.
- `-to<test time out>`: Type the maximum time the source node will wait for a response from the destination node before stopping the request in milliseconds.
- `-ps <packet size>`: Type the size of the packet sent.
- `-pn <number of packets>`: Type the number of packets sent.
- `-pd <inter packet delay>`: Type the inter packet delay in milliseconds.
- `-ct <CdecType>`: Type the codec type for which you need to configure the QA probes. The valid codec types are `g711_u_law` or `g711_a_law` or `g729a`. This is a required parameter if you selected the `voip` service.

The probes configured will be discovered in the next discovery cycle.

Batch Upload of QA Probes Using Command Line Utility

Use the following command to to do a batch upload of a number of QA probes in NNM iSPI

Performance for QA

`nmsqaprobeconfig.ovpl -u <username> -p <password> -f` < *qa probe setup input file*>

You can find the input file format `qaprobeconfig.tmpl` in the following directory:

On UNIX: */var/opt/OV/shared/qa/conf*

On Windows: *%NnmDataDir%\shared\qa\conf*

This file gives you the format to enter the probe configuration details and upload the QA probes.

While you enter probe configuration details for a specific test type or service type in the *qa probe setup input file*, the user needs to enter only those parameters that are required and delete the other parameters. However, you **must** specify the test name in the *qa probe setup input file* for all the test type or service type.

Launching the Probe Configuration Form

Perform the following steps to launch the Probe Configuration form:

1. Log on to NNMi console using your username and password.

   You must have administrator privileges.

2. You can launch the Probe Configuration form from the Nodes Inventory, Network Overview, Interfaces Inventory or IP Addresses inventory view.

   To launch the Probe Configuration form from the Nodes Inventory

   a. Click **Inventory**.

   b. Click **Nodes**

   c. Select the required nodes in the Nodes inventory for which you need to configure the QA probes

   d. Go to step 3

   To launch the Probe Configuration form from the Network Overview

   a. Click **Topology Maps**. The Topology Maps expand.

   b. Click **Network Overview**

   c. Select the required nodes in the Network Overview for which you need to configure the QA probes

   d. Go to step 3

   To launch the Probe Configuration form from the Interfaces Inventory

   a. Click **Inventory**.

   b. Click **Interfaces**.

   c. Select the required interfaces in the Interfaces inventory

   d. Go to step 3

   To launch the Probe Configuration form from the IP Addresses Inventory

   a. Click **Inventory**. The Inventory expands

   b. Click **IP Addresses**

   c. Select the required IP Addresses in the IP Addresses inventory

   d. Go to step 3

3. Select **Actions** → **Quality Assurance** → **Probe Configuration**

   The Probe Configuration form opens.

   The following icons are available in the Probe Configuration form:

Icons Available in the Probe Configuration Toolbar	Description
Open	Opens a dialog box where you can specify to open a file that has the probe configuration details. Browse button is provided to access the file.
Close	Closes the Probe Configuration form without saving the current configuration
Save	Opens a dialog box where you can specify to save the probe configuration details to a file in a specified directory.

Probe Configuration Form: Probe Definition Tab

You can use the **Probe Definition** tab to do the following tasks for the selected source and destination node:

- Create a new probe
- Create a probe using a pre-defined template
- Deploy the configured QA probes on the node
- Copy the probe definition

To create a new probe definition:

1. Launch the Probe Configuration form.
2. Enter the Source Node and Destination Node details.

   Source Node Details

Field Name	Description
Hostname	*Mandatory information* Specify the hostname of the source node for which you intend to configure the probes.
Tenant Name	Select an NNMi tenant from the list of tenants created in NNMi. NNMi provides a tenant named Default Tenant and assigns each newly discovered node to the Default Tenant and the Security Group attribute value configured for the Default Tenant. As an NNMi administrator, you can create new tenants and security groups. See *Configure Tenants* and *Configuring Security* in *HP Network Node Manager i Software Online Help: Help for Administrators*.
IP Address	Specify the IP address of the source node.
Port Number	*Mandatory information* Appears after you select the Service in the Probe Definition form. However, this field does not appear if you select ICMP Echo service. Specify the source port from which you intend to configure probes.
Write Community String	Specify the write community string to authenticate the source node. If you leave this field blank, NNM iSPI Performance for QA retrieves the SNMP Write Community String value from NNMi.

Destination Node Details

Field Name	Description
Hostname	Specify the hostname of the destination node for which you intend to configure the iRA probes.
IP Address	*Mandatory information* Specify the destination IP address for the iRA probe.
Port Number	*Mandatory information* Appears after you select the Service in the Probe Definition form.

Field Name	Description
	However, this field does not appear if you select ICMP Echo service. Specify the destination port for the probe.

3. In the **Probe Definition** tab, specify the following details:

   Protocol Details

Field Name	Description
Probe Name	*Mandatory information* Specify the name of the new probe.
VRF Name	Specify the VRF name.
Service	*Mandatory information* Select any of the following service types: ▪ ICMP Echo ▪ TCP Connect ▪ UDP ▪ UDP Echo ▪ VoIP After you select a service, the Port Number field appears for the Source Node Details and Destination Node Details sections. However, the Port Number field does not appear if you select ICMP Echo service.
ToS	Specify the Type of Service.

4. Enter the following Duration Details:

Field Name	Description
Frequency	*Mandatory information* The frequency at which the probe must run the tests. Click on this field to enter the hour, minute, and seconds.

Field Name	Description
Life Time	Specify the life time of the Probe. The default value is `Forever`. To override this value, click on this field to enter the day, hour, and minute.
Time Out	Specify the maximum time period for the source node to wait for a response from the destination node. Click on this field to enter the hour, minute, and seconds.

Based on the Service type that you selected, specify the following service details:

ICMP Details

In the Packet Size field, specify the packet size.

TCP Connect Details

In the Packet Size field, specify the packet size.

UDP Details

Specify the following information:

Field Name	Description
Packet Size	Specify the packet size.
Number of Packets	Specify the number of packets sent.
Inter Packet Delay (Milliseconds)	Specify the inter packet delay in milliseconds.

UDP Echo Details

In the Packet Size field, specify the packet size.

VoIP Details

Field Name	Description
Packet Size	Specify the packet size.
Number of Packets	Specify the number of packets sent.
Inter Packet Delay (Milliseconds)	Specify the inter packet delay in milliseconds.
Codec Type	*Mandatory information* Select the codec type.

5. You can also create a probe using a pre-defined probe template by following the step below: Select the template in the **Select Template** list.

6. In the Probe Definition tab, click **Deploy** to deploy a single probe. The Deploy operation performs the SNMP set operation on the selected source node.
7. To deploy multiple probes, follow these steps:
   a. Click **Add** to add the probes temporarily to the Probe List table.
   b. Select the probes, and click **Deploy**.
8. You can view the deployment status the iRA probes that you configured in the Deploy Status tab.
9. Alternatively, you can save the probe configuration details to a file and deploy the probes at a later point of time. To save the probe configuration details to a file, you must click **Save** in the Probe Configuration toolbar.

Probe Configuration Form: Template Definition Tab

You can use the **Template Definition** tab to do the following tasks:

- Define a QA probe template that can be reused and associated with any source and destination node
- Edit or view an existing template
- View the probe definition template based on the author name
- Copy the template definition

To define a new probe template:

1. Launch the Probe Configuration form.
2. Select the **Template Definition** tab.
3. Click **New** in the toolbar below the **Template Definition** tab.
4. Select the author name to retrieve the template list based on the authors. NNM iSPI Performance for QA retrieves the author names defined in NNMi. The template list appears only if any template exists for the selected author.
5. Specify the Protocol Details and Duration Details for the QA probe:

   Protocol Details

Field Name	Description
Template Name	*Mandatory information* Specify the name of the new probe template.

Field Name	Description
VRF Name	Specify the VRF name.
Service	*Mandatory information* Select any of the following service types: ▪ DNS ▪ HTTP ▪ HTTPS ▪ ICMP Echo ▪ Oracle ▪ TCP Connect ▪ UDP Echo ▪ UDP ▪ VoIP
ToS	Specify the Type of Service.

Duration Details

Field Name	Description
Frequency	*Mandatory information* The frequency at which the probe must run the tests. Click on this field to enter the hour, minute, and seconds.
Life Time	Specify the life time of the Probe. The default value is `Forever`. To override this value, click on this field to enter the day, hour, and minute.
Time Out	Specify the maximum time period for the source node to wait for a response from the destination node. Click on this field to enter the hour, minute, and seconds.

Based on the Service type that you selected, specify the following service details:

DNS Details

Specify the DNS address for the probe to resolve.

HTTP and HTTPS Details

Field Name	Description
Download Content	Specify whether to download the content of the destination web page
Proxy Server	Specify the HTTP proxy hostname if you intend to use proxy server
Proxy User Name	Specify the HTTP proxy username
HTTP URI	Specify the HTTP URL that the probe should use
Proxy Port	Specify the HTTP proxy port number
Proxy Password	Specify the HTTP proxy password

ICMP Details

Field Name	Description
Packet Size	Specify the packet size.
Number of Packets	Specify the number of packets sent.
Inter Packet Delay (Milliseconds)	Specify the inter packet delay in milliseconds.

Oracle Details

Field Name	Description
User Name	*Mandatory information* Specify the Oracle database user name.
Database Name	*Mandatory information* Specify the name of the database running on the target Oracle server.
Password	*Mandatory information* Specify the Oracle database password.
SQL Query	Specify the SQL Query that the QA probe would run

TCP Connect Details

Field Name	Description
Packet Size	Specify the packet size.
Number of Packets	Specify the number of packets sent.
Inter Packet Delay	Specify the inter packet delay in milliseconds.

Field Name	Description
(Milliseconds)	

UDP and UDP Echo Details

Specify the following information:

Field Name	Description
Packet Size	Specify the packet size.
Number of Packets	Specify the number of packets sent.
Inter Packet Delay (Milliseconds)	Specify the inter packet delay in milliseconds.

VoIP Details

Field Name	Description
Packet Size	Specify the packet size.
Number of Packets	Specify the number of packets sent.
Inter Packet Delay (Milliseconds)	Specify the inter packet delay in milliseconds.
Codec Type	*Mandatory information* Select the codec type.

6. Click 💾 **Save** in the Template Definition toolbar.
7. After you save the template definition details, the details appear in the template list.

You can select a template in the template list and open, copy, or delete the template.

Probe Configuration Form: Deploy Status Tab

You can use the **Deploy Status** tab to do the following tasks:

- View the probe deployment status
- Launch the real time graph
- Select the probes to be reconfigured. You can only reconfigure probes whose Deploy Status is Failure.

To view the probe deploy status:

1. Select the **Deploy Status** tab in the Probe Configuration form.
2. On the left pane, you can view the following details:

Field Name	Description
Total Count	The total number of probes that you attempted to deploy irrespective of the status.
In Progress Count	The number of probes that are being deployed.
Success Count	The number of probes that were successfully deployed.
Failed Count	The number of probes that did not get deployed successfully.

3. On the right pane, you can view the following details:

Field Name	Description
Operational Status	The deployment status of the probe. The valid statuses are: ▪ In-progress: Indicates the SNMP set operation is in-progress ▪ Success: Indicates the SNMP set operation is successful ▪ Failure: Indicates the SNMP set operation is a failure
Source Hostname	The hostname of the source node.
Probe Name	The name of the QA probe.
Owner	The owner of the QA probe.
Status Details	Displays a message on successful deployment of the probe, or indicates the reason for failure in the event of failure

You can view the percentage of QA probes deployed irrespective of the deployment status in the status bar.

4. Select any one of the following options:

Icons Available in the Deploy Status Tab	Description
Edit	Allows to reconfigure the selected QA Probe details for which the deployment status is Failure
Launch Real Time Graph	Launches the real time line graph in a new window for the selected probes and metric
Refresh	Refreshes the details

Probe Configuration Form: Probe List Tab

You can use the **Probe List** tab to do the following tasks for the selected source and destination node:

- View the configured probe definition in a new window
- Delete the selected probe definition
- Open the selected probe
- Deploy the selected probes on the node
- Enable to select all the probes in the Probe List

To access the probe list:

1. Launch the Probe Configuration form

   You can view three tabs below the Probe Configuration form; Probe List, Template List, and Real Time Graph

2. Select the **Probe List** tab.

   You can view the following details:

Field Name	Description
Probe Name	The name of the QA probe.
Source IP Address	The source IP address of the node.
Destination IP Address	The destination IP address of the node.
Service	The service type of the QA probe can be any one of the following: ▪ UDP Echo ▪ ICMP Echo ▪ UDP ▪ TCP Connect ▪ VoIP
ToS	The Type of Service specified in an IP packet header that indicates the service level required for the packet.
VRF Name	The name of the VRF.
Frequency	The frequency at which the specific QA probe test must be repeated.
Source Port	The source port from which the QA probes are configured.
Destination Port	The destination port until which the QA probes are configured.

Field Name	Description
Life Time	The life time of the QA Probe.
Time Out	Maximum time the source node will wait for a response from the destination node before stopping the probes to run on the node.
Codec Type	The type of codec.
Source Hostname	The hostname of the source node for which the QA probes are configured.
Destination Hostname	The hostname of the destination node for which the QA probes are configured.

3. You can find a list of options on the left-side below the Probe Configuration form. Select any one of the following options (if required):

Icons Available in the Probe List Tab	Description
Deploy	Deploys the selected configured probes on the selected node
Open	Opens and allows to edit the selected probe definition
Copy	Copies the selected probe that appears in the Probe Definition form
Delete	Deletes the selected probe definition
Select All	Selects or deselects all the probes in the probe list

Probe Configuration Form: Template List Tab

You can use the **Template List** tab to do the following tasks for the selected source and destination node:

- View the template definition in a new window
- Delete the selected template definition
- Allows to select all the templates in the Template List

To access the template list:

1. Launch the Probe Configuration form

   You can view two tabs below the Probe Configuration form; Probe List, and Template List

2. Select the **Template List** tab.

You can view the following details:

Field Name	Description
Template Name	The name of the QA probe template.
Service	The service type of the QA probe can be any one of the following: ▪ **UDP Echo** ▪ **ICMP Echo** ▪ **UDP** ▪ **TCP Connect** ▪ **VoIP**
VRF Name	The name of the VRF.
ToS	The Type of Service specified in an IP packet header that indicates the service level required for the packet.
Frequency	The frequency at which the specific QA probe test must be repeated.
Life Time	The life time of the QA Probe.
Time Out	Maximum time the source node will wait for a response from the destination node before stopping the probes to run on the node.
Codec Type	The type of codec.
Packet Size	The size of each packet.
Number of Packets	The number of packets sent.
Inter Packet Delay (milliseconds)	The inter packet delay in milliseconds.

3. You can find a list of options on the left-side below the Probe Configuration form. Select any one of the following options (if required):

Icons Available in the Template List Tab	Description
Open	Opens and allows to edit the selected template in the Template Definition form
Copy	Copies the selected template that appears in the Template Definition form
Delete	Deletes the selected template definition
Select All	Selects or deselects all the templates in the template list

Probe Configuration Form: Preconfigured Probes Tab

You can use the **Preconfigured Probes** tab to view the list of configured probes discovered and monitored by NNM iSPI Performance for QA. Also, you can launch the real time line graph for the probes.

To view the preconfigured probes list:

1. Launch the Probe Configuration form
2. Select the **Preconfigured Probes** tab.

   You can view the following details:

Field Name	Description
Probe Status	The status that the QA probe returned. A QA probe may return any of the following statuses : ■ Normal ■ Warning ■ Major ■ Critical ■ Unknown ■ Disabled ■ Not Polled ■ No Status For more information on status, see the topic QA Probe Status
Probe Name	The name of the QA probe.
Owner	The owner of the QA probe.
Source Hostname	The hostname of the source node for which the QA probes are configured.
Destination IP Address	The destination IP address of the node.
Service	The service type of the QA probe. The valid service types are: ■ DNS ■ HTTP ■ HTTPS

Field Name	Description
	▪ ICMP Echo ▪ Oracle ▪ TCP Connect ▪ UDP Echo ▪ UDP ▪ VoIP
VRF Name	The VRF name
ToS	The Type of Service specified for the probe

3. To launch the Real Time Line Graph for the probes:
   a. Select the probes and select the metric from the drop-down list.
   b. Select **Launch Real Time Graph**
   The Real Time Line Graph opens in a new window

   See the topic Real Time Line Graph for more information.

Probe Configuration Form: Probe Definition Tab

Use the **Probe Definition** tab to do the following tasks for the selected source and destination node:

- Create a new iRA probe
- Create a probe using a pre-defined template
- Deploy the configured iRA probes on the node
- Copy the probe definition

To create a new probe definition:

1. Launch the Probe Configuration form.
2. Specify the Source Node and Destination Node details.

   Source Node Details

Field Name	Description
Hostname	*Mandatory information* Specify the hostname of the source node for which you intend to configure the probes.

Field Name	Description
Tenant Name	Select an NNMi tenant from the list of tenants created in NNMi. NNMi provides a tenant named Default Tenant and assigns each newly discovered node to the Default Tenant and the Security Group attribute value configured for the Default Tenant. As an NNMi administrator, you can create new tenants and security groups. See *Configure Tenants* and *Configuring Security* in *HP Network Node Manager i Software Online Help: Help for Administrators*.
IP Address	Specify the IP address of the source node.
Port Number	*Mandatory information* Appears after you select the Service in the Probe Definition form. However, this field does not appear if you select ICMP Echo service. Specify the source port from which you intend to configure probes.
Write Community String	Specify the write community string to authenticate the source node. If you leave this field blank, NNM iSPI Performance for QA retrieves the SNMP Write Community String value from NNMi.

Destination Node Details

Field Name	Description
Hostname	Specify the hostname of the destination node for which you intend to configure the iRA probes.
IP Address	*Mandatory information* Specify the destination IP address for the iRA probe.
Port Number	*Mandatory information* Appears after you select the Service in the Probe Definition form. However, this field does not appear if you select ICMP Echo service. Specify the destination port for the probe.

3. In the **Probe Definition** tab, specify the following details:

Protocol Details

Field Name	Description
Probe Name	*Mandatory Information* Specify the name of the new probe
VRF Name	Specify the VRF name
Service	Select any one of the following service types: - DNS - HTTP - HTTPS - ICMP Echo - Oracle - TCP Connect - UDP After you select a service, the Port Number field appears for the Source Node Details and Destination Node Details sections. However, the Port Number field does not appear if you select ICMP Echo and DNS service.
ToS	Specify the Type of Service

Duration Details

Field Name	Description
Frequency	*Mandatory information* The frequency at which the probe must run the tests. Click on this field to enter the hour, minute, and seconds.
Life Time	Specify the life time of the Probe. The default value is `Forever`. To override this value, click on this field to enter the day, hour, and minute.
Time Out	Specify the maximum time period for the source node to wait for a response from the destination node. Click on this field to enter the hour, minute, and seconds.

Service Details

Based on the Service type that you selected, specify the following service details:

DNS Details

Specify the DNS address for the probe to resolve.

HTTP and HTTPS Details

Field Name	Description
Download Content	Specify whether to download the content of the destination web page
Proxy Server	Specify the HTTP proxy hostname if you intend to use proxy server
Proxy User Name	Specify the HTTP proxy username
HTTP URI	Specify the HTTP URL that the probe should use
Proxy Port	Specify the HTTP proxy port number
Proxy Password	Specify the HTTP proxy password

ICMP Details

Field Name	Description
Packet Size	Specify the packet size.
Number of Packets	Specify the number of packets sent.
Inter Packet Delay (Milliseconds)	Specify the inter packet delay in milliseconds.

Oracle Details

Field Name	Description
User Name	*Mandatory information* Specify the Oracle database user name.
Database Name	*Mandatory information* Specify the name of the database running on the target Oracle server.
Password	*Mandatory information* Specify the Oracle database password.
SQL Query	Specify the SQL Query that the QA probe would run

TCP Connect Details

Field Name	Description
Packet Size	Specify the packet size.
Number of Packets	Specify the number of packets sent.
Inter Packet Delay (Milliseconds)	Specify the inter packet delay in milliseconds.

UDP and UDP Echo Details

Specify the following information:

Field Name	Description
Packet Size	Specify the packet size.
Number of Packets	Specify the number of packets sent.
Inter Packet Delay (Milliseconds)	Specify the inter packet delay in milliseconds.

VoIP Details

Field Name	Description
Packet Size	Specify the packet size.
Number of Packets	Specify the number of packets sent.
Inter Packet Delay (Milliseconds)	Specify the inter packet delay in milliseconds.
Codec Type	*Mandatory information* Select the codec type.

4. You can also create a probe using a pre-defined probe template by following the step below: Select the template in the **Select Template** list.
5. In the Probe Definition tab, click **Deploy** to deploy a single probe. The Deploy operation performs the SNMP set operation on the selected source node.
6. To deploy multiple probes, follow these steps:
   a. Click **Add** to add the probes temporarily to the Probe List table.
   b. Select the probes, and click **Deploy**.
7. You can view the deployment status the iRA probes that you configured in the Deploy Status tab.

8. Alternatively, you can save the probe configuration details to a file and deploy the probes at a later point of time. To save the probe configuration details to a file, you must click **Save** in the Probe Configuration toolbar.

Probe Configuration Form: Template Definition Tab

Use the **Template Definition** tab to perform the following tasks:

- Define an iRA probe template that can be reused and associated with any source and destination node
- Edit or view an existing template
- View the probe definition template based on the author name
- Copy the template definition

To define a new probe template:

1. Launch the Probe Configuration form.
2. Select the **Template Definition** tab.
3. Click **New** in the Template Definition toolbar.
4. Select the author name to retrieve the template list based on the authors. NNM iSPI Performance for QA retrieves the author names defined in NNMi. The template list appears only if any template exists for the selected author.
5. Specify the Protocol Details and Duration Details for the iRA probe:

   Protocol Details

Field Name	Description
Template Name	*Mandatory information* Specify the name of the new probe template.
VRF Name	Specify the VRF name.
Service	*Mandatory information* Select any of the following service types: ▪ DNS ▪ HTTP ▪ HTTPS

Field Name	Description
	ICMP Echo Oracle TCP Connect UDP Echo UDP VoIP
ToS	Specify the Type of Service.

Duration Details

Field Name	Description
Frequency	*Mandatory information* The frequency at which the probe must run the tests. Click on this field to enter the hour, minute, and seconds.
Life Time	Specify the life time of the Probe. The default value is `Forever`. To override this value, click on this field to enter the day, hour, and minute.
Time Out	Specify the maximum time period for the source node to wait for a response from the destination node. Click on this field to enter the hour, minute, and seconds.

Based on the Service type that you selected, specify the following service details:

DNS Details

Specify the DNS address for the probe to resolve.

HTTP and HTTPS Details

Field Name	Description
Download Content	Specify whether to download the content of the destination web page
Proxy Server	Specify the HTTP proxy hostname if you intend to use proxy server
Proxy User Name	Specify the HTTP proxy username
HTTP URI	Specify the HTTP URL that the probe should use

Field Name	Description
Proxy Port	Specify the HTTP proxy port number
Proxy Password	Specify the HTTP proxy password

ICMP Details

Field Name	Description
Packet Size	Specify the packet size.
Number of Packets	Specify the number of packets sent.
Inter Packet Delay (Milliseconds)	Specify the inter packet delay in milliseconds.

Oracle Details

Field Name	Description
User Name	*Mandatory information* Specify the Oracle database user name.
Database Name	*Mandatory information* Specify the name of the database running on the target Oracle server.
Password	*Mandatory information* Specify the Oracle database password.
SQL Query	Specify the SQL Query that the QA probe would run

TCP Connect Details

Field Name	Description
Packet Size	Specify the packet size.
Number of Packets	Specify the number of packets sent.
Inter Packet Delay (Milliseconds)	Specify the inter packet delay in milliseconds.

UDP and UDP Echo Details

Specify the following information:

Field Name	Description
Packet Size	Specify the packet size.

Field Name	Description
Number of Packets	Specify the number of packets sent.
Inter Packet Delay (Milliseconds)	Specify the inter packet delay in milliseconds.

VoIP Details

Field Name	Description
Packet Size	Specify the packet size.
Number of Packets	Specify the number of packets sent.
Inter Packet Delay (Milliseconds)	Specify the inter packet delay in milliseconds.
Codec Type	*Mandatory information* Select the codec type.

6. Click **Save** in the Template Definition toolbar.
7. After you save the template definition details, the details appear in the template list.

You can select a template in the template list and open, copy, or delete the template.

Probe Configuration Form: Deploy Status Tab

You can use the **Deploy Status** tab to do the following tasks:

- View the probe deployment status
- Launch the real time graph
- Select the probes to be reconfigured. You can only reconfigure probes for which the deployment failed.

To view the probe deploy status:

1. Select the **Deploy Status** tab in the Probe Configuration form.
2. On the left pane, you can view the following details:

Field Name	Description
Total Count	The total number of probes that you attempted to deploy irrespective of the status.
In Progress Count	The number of probes that are being deployed.

Field Name	Description
Success Count	The number of probes that were successfully deployed.
Failed Count	The number of probes that did not get deployed successfully.

3. On the right pane, you can view the following details:

Field Name	Description
Operational Status	The deployment status of the probe. The valid statuses are: ▪ In-progress: Indicates the SNMP set operation is in-progress ▪ Success: Indicates the SNMP set operation is successful ▪ Failure: Indicates the SNMP set operation is a failure
Source Hostname	The hostname of the source node.
Probe Name	The name of the probe.
Owner	The owner of the probe.
Status Details	Displays a message on successful deployment of the probe, or indicates the reason for failure in the event of failure

You can view the percentage of probes deployed irrespective of the deployment status in the status bar.

4. Select any one of the following options:

Deploy Status Tool	Description
Edit	Enables you to reconfigure the selected probe details for which the deployment status is marked as Failure
Launch Real Time Graph	Launches the real time line graph in a new window for the selected probes and metric
Refresh	Refreshes the deployment status details

Probe Configuration Form: Preconfigured Probes Tab

You can use the **Preconfigured Probes** tab to view the list of configured probes discovered and monitored by NNM iSPI Performance for QA. Also, you can launch the real time line graph for the probes.

To view the pre-configured probes list:

1. Launch the Probe Configuration form
2. Select the **Preconfigured Probes** tab.

   You can view the following details:

Field Name	Description
Probe Status	The probe status A probe may return any of the following status: ■ ✓ Normal ■ ▲ Warning ■ ▼ Major ■ ✖ Critical ■ ? Unknown ■ ▨ Disabled ■ 📅 Not Polled ■ ⊘ No Status For more information on status, see the topic QA Probe Status
Probe Name	The name of the probe.
Owner	The owner of the probe.
Source Hostname	The hostname of the source node for which the probes are configured.
Destination IP Address	The destination IP address for the probe

Field Name	Description
Service	The service type for the probe. The valid service types are: ▪ DNS ▪ HTTP ▪ HTTPS ▪ ICMP Echo ▪ Oracle ▪ TCP Connect ▪ UDP Echo ▪ UDP ▪ VoIP
VRF Name	The VRF name
ToS	The Type of Service specified for the probe

3. To launch the Real Time Line Graph for the probes:

   a. Select the probes and select the metric from the drop-down list.

   b. Select **Launch Real Time Graph**
   The Real Time Line Graph opens in a new window

   See the topic Real Time Line Graph for more information.

NNM iSPI Performance for QA QA Probe Threshold Configuration

You can configure thresholds for Site and QA Group (QA Probes), using the NNM iSPI Performance for QA QA Probe Threshold Configuration.

Launching the Threshold Configuration Form

To launch the QA Probe threshold configuration form:

1. Log on to NNMi console using your username and password.

   You must have administrator privileges.

2. From the workspace navigation panel, select **Configuration** workspace.

3. Select **Quality Assurance Configuration Console**.
   The console opens.

4. In the **Configuration** workspace, select **Probe Site / QA Group Threshold Configuration**

   The Threshold Configuration form opens.

You can perform the following tasks using the Threshold Configuration form:

Any changes made to the threshold settings are applied to the poller immediately.

Icons Available in the Threshold Configuration Toolbar	Description
Close	Closes the Threshold Configuration form without saving the current configuration
Save	Saves the current configuration.
Save and Close	Saves the current configuration and closes the Threshold Configuration form
Refresh	Retrieves the last saved threshold configuration from the database and displays the data in the Threshold Configuration form
Export Export	Exports the existing thresholds • Site • QA Group
Import Import	Imports the existing thresholds • Site • QA Group

Icons Available in the Global Settings Panel	Description
Enable	Enables the site wide threshold configuration

Icons Available in the Site Wide Configuration Panel	Description
New	Adds a new threshold configuration • Site • QA Group
Edit	Edits an existing threshold configuration • Site • QA Group
Delete	Deletes an existing threshold configuration: • Site • QA Group
Refresh	Retrieves the last saved data from the database and displays the data in the Site Wide Configuration panel
Delete All Delete All	Deletes all the existing thresholds

Icons Available in the Threshold Configuration Toolbar	Description
	- Site - QA Group

NNM iSPI Performance for QAThreshold Configuration for Site

NNM iSPI Performance for QA thresholds enables you to track the health and performance of the **network elements**[1] in a network.

You can establish thresholds for the probes associated with sites. You can configure these thresholds to create an incident whenever the network performance measurement assigned to the site breaches the threshold.

To configure a threshold for a site, you must have a source site, but may not have a destination site. If you do not assign a destination site to the threshold, the threshold is applied to all the QA probes run from the source site.

You can configure thresholds for the following Quality Assurance metrics derived from the QA probes configured for an existing site:

- Round Trip Time (RTT)
- Jitter
- Packet Loss (Can be from source to destination, and from destination to source.)
- Mean Opinion Score (MOS)

NNM iSPI Performance for QA performs the following actions if a threshold is breached:

- Sets the QA probe status to Major.
- Creates an incident for the violated threshold.
- Sends the threshold violation details to the Network Performance Server for generating reports.
- Retains the threshold state as Nominal, or sets the threshold state to High or Low depending on the count based, or time based threshold configuration.

You can see the contents of the topic Probe Specific Threshold Configuration to override thresholds of probes specific to a site.

In a GNM environment, the global manager receives the threshold states from the sites in the regional managers. You **cannot** configure thresholds for remote sites. The thresholds configured for the sites of the global managers are not applicable for the sites of regional managers.

You can monitor the network performance and generate an incident based on the count based threshold or time based threshold configuration.

[1] Some examples of network elements are routers, switches, and phone connections

You can only configure either a count based or time based threshold configuration for a combination of a site, service, and metric.

Threshold Configurations

Count Based Threshold Configuration

You can generate an incident based on the count or number of consecutive times a metric violates the threshold value. You can define this count in the Threshold Configuration form, and you can specify to trigger an incident when the threshold violation exceeds this count.

Time Based Threshold Configuration

Time based threshold configuration enables you to raise an alert when the threshold breached state persists for more than a specific time period. This is derived by specifying X as the duration of time in minutes when the metric is in a threshold breached state within Y number of minutes specified in the sliding window. Based on your choice, you can trigger an incident if required.

Example for Time Based Threshold Configuration

Consider a scenario, where the polling interval is 5 minutes; High duration is 10 minutes; and High Duration Window is 60 minutes. In this scenario, an incident is generated whenever the High Duration exceeds 10 minutes within the 60 minute duration. NNM iSPI Performance for QA uses a sliding window wherein each time the High Duration (10 minutes) is reached, NNM iSPI Performance for QA drops the oldest polled value (first 5 minutes) and adds the most recent (between 60 to 65 minutes). This procedure continues and enables you to determine time based threshold violation.

You can make utmost use of the Time based threshold violation by ensuring that the duration specified in the sliding window is greater than or equal to the polling interval.

Baseline Settings Configuration

Baseline Deviation Settings Configuration

Apart from the time based and count based threshold configuration, you can also do a baseline monitoring based on the baseline deviation setting configuration in NNM iSPI Performance for QA. You can do a baseline deviation setting configuration for the selected site, service, and metric. An incident is generated and the baseline state transitions to Abnormal Range only if it meets all the criteria listed below:

- Exceeds the count or the number of standard deviation that is above the average value for the metric, or exceeds the count or the number of standard deviation that is below the average value for the metric.This count is specified in the Upper Baseline Limit Deviations or Lower Baseline Limit Deviations for the selected metric in the baseline deviation settings configuration.
- Exceeds the duration for which the upper or lower baseline deviation persists in the specified sliding window duration

Adding New Threshold Configuration

To add a new threshold configuration:

1. Launch the Threshold Configuration form.
2. Click **New** in the **Threshold Configuration** panel.

   The Add Threshold Configuration form opens.
3. Select **Site** in Threshold Type field.
4. Specify the following information in the **Threshold Configuration** panel:

Field Name	Description
Threshold Type	In the Threshold Type, select **Site Based**.
Order	Specify a numeric value. NNM iSPI Performance for QA checks the configuration settings in the order you define (lowest number first)
Source Site	Select the name of the source site. This field is mandatory.
Destination Site	Select the destination site for the QA probes. This field is optional.
Service	The type of the discovered QA probe. This field is mandatory. NNM iSPI Performance for QA recognizes the following QA probe types: ▪ **UDP Echo** ▪ **ICMP Echo** ▪ **UDP** ▪ **TCP Connect** ▪ **VoIP**

3.

You can view the two tabs; Threshold Settings and Baseline Settings.

4. You can perform the following tasks when you click on the **Threshold Settings** tab.

Icons Available in the Threshold Settings Tab	Description
New	Adds a new threshold for the site
Edit	Edits the threshold for the site
Delete	Deletes the selected threshold for the site
Refresh	Retrieves the last saved threshold configuration from the database and displays the data
✕ Delete All Delete All	Deletes all the threshold configured for the site

5. You can perform the following tasks when you click on the **Baseline Settings** tab.

Icons Available in the Baseline Settings Tab	Description
New	Adds a new baseline setting for the site
Edit	Edits the baseline setting for the site
✕ Delete	Deletes the selected baseline settings for the site
Refresh	Retrieves the last saved threshold configuration from the database and displays the data
✕ Delete All Delete All	Deletes all the baseline settings configured for the site

Adding New Threshold Settings Using the Threshold Configuration Form

To add a new threshold:

1. Make sure that you selected the Source Site, and Service in the Add Threshold Configuration
2. Click **New** in the **Threshold Settings** tab.

   The Add Threshold Settings form opens.
3. Specify the following to configure the threshold settings:

Field Name	Description
Type	Select the type of threshold violation. The valid types are Count Based and Time Based.
Metric	Select the metric for which you are configuring the threshold. The metrics are populated based on the service.

4. After you select the metric to configure the threshold, the list of fields relevant to the selected metric appear. You can specify the following values to configure the new threshold:

Field Name	Description
High Value	Enter the threshold value. This value indicates the maximum value above which the metric will be considered to have violated the Nominal range. For Packet Loss metric, enter the High Value in percentage.
High Value Rearm	Enter the high value rearm for the threshold. For Packet Loss metric, enter the High Value Rearm in percentage. The High Value Rearm is used to indicate the end of the high threshold state and NNM iSPI Performance for QA clears the incident once it reaches below this value. The high value rearm must always be lower than the high value. **Example** For the **Round Trip Time (RTT)** you must generate an incident when the RTT is 150 and clear the incident when the RTT value comes down to 100. Set the following values for the threshold: ▪ High Value: `150` ▪ High Value Rearm: `100`

Field Name	Description
	This value enables you to be aware when a network performance problem starts to improve.
Low Value	Enter the low threshold value. This value indicates the maximum value below which the metric will be considered to have violated the Nominal range.
Low Value Rearm	Enter the low value rearm for the threshold. For Packet Loss metric, enter the Low Rearm Value in percentage. The low value rearm is used to indicate the end of the low threshold state and NNM iSPI Performance for QA clears the incident once it reaches above this value. The low value rearm must be greater than the low value. **Example** For the **Mean Opinion Score (MOS)** you must generate an incident when the MOS score is 3 and clear the incident when the score is improved to 4.5. Set the following values for the threshold: ▪ Low Value: `3` ▪ Low Value Rearm: `4.5` This value enables you to be aware when a network performance problem starts to improve.

The following field appears, if you selected the Type as Count Based:

Field Name	Description
Trigger Count	Specify after how many consecutive threshold violations NNM iSPI Performance for QA must alert the operator by transitioning the threshold state to High or Low accordingly.

The following fields appear if you selected the Type as Time Based:

Field Name	Description
High Duration	Enter the minimum amount of time for which the QA probes must report high metric values. For example if you specify this value to be 20 minutes for Packet Loss Percentage metric, NNM iSPI Performance for QA considers the threshold to be violated if the Packet Loss Percentage is high for 20 minutes.

Field Name	Description
	You define the high threshold value in the High Value field. Set the polling interval as less than or equal to the high duration value.
High Duration Window	Define a window for the high duration value. For example, if you specify this value to be 30 minutes for Packet Loss Percentage metric, NNM iSPI Performance for QA considers the threshold to be violated if the Packet Loss Percentage is high for 20 out of 30 minutes. You define the high threshold value in the High Value field and the high duration in the High Duration field. NNM iSPI Performance for QA drops the oldest polled value and adds the most recent value each time the metric value reaches the High Duration Window. This method is called Sliding Window method, where only the newest set of values are considered for the thresholds. While specifying this value follow these guidelines: ▪ This value must be greater than 0 (zero). ▪ This value can be same as the High Duration value.

The following fields appear if you selected the Type as Time Based and the metric as MOS:

Low Duration	Enter the minimum amount of time for which the QA probes must report low metric values. For example if you specify this value to be 20 minutes for MOS metric, NNM iSPI Performance for QA considers the threshold to be violated if the MOS is low for 20 minutes. You define the high threshold value in the Low Value field. Set the polling interval as less than or equal to the low duration value.
Low Duration Window	Define a window for the low duration value. For example, if you specify this value to be 30 minutes for MOS metric, NNM iSPI Performance for QA considers the threshold to be violated if the MOS is low for 20 out of 30 minutes. You define the low threshold value in the Low Value field and the low duration in the Low Duration field. NNM iSPI Performance for QA drops the oldest polled

	value and adds the most recent value each time the metric value reaches the Low Duration Window. This method is called Sliding Window method, where only the newest set of values are considered for the thresholds. While specifying this value follow these guidelines: ▪ This value must be greater than 0 (zero). ▪ This value can be same as the Low Duration value.

5. Select the following to generate an incident when the time based threshold or count based threshold value is violated:

Field Name	Description
Generate Incident	Select this option if you want NNM iSPI Performance for QA to generate an incident for count based or time based threshold violations. By default this option is selected.

6. Use any one of the following options to complete the task:

Icons	Description
Close	Closes the Add Threshold Configuration form without saving the threshold information you have entered.
Save and Close	Saves the threshold information and closes the Threshold Configuration form

7. Click **Refresh** to view the changes.

8. Click **Save** or **Save and Close** in the Threshold Configuration form.

> **Caution:** The new threshold is not saved unless you click **Save** or **Save and Close** in the Threshold Configuration form.

NNM iSPI Performance for QA applies the following rules while creating thresholds for a **site** using this form:

- You can create thresholds only for the existing sites.
- You must select a source site and service for the new threshold.
- You could select the destination site for the new threshold
- If you do not specify a destination site for the threshold, the threshold is applied to all the destination sites of the source sites.
- You cannot configure thresholds for remote sites.

For a Time Based Threshold configuration on probes, if the polling interval is greater than the High Duration or Low Duration value, the threshold cannot be configured for those QA probes. A list of these QA Probes, the UUID, and other details can be viewed in the log file, which is available in the following directory:

UNIX:*$NnmDataDir/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

Adding New Baseline Settings Using the Threshold Configuration Form

To add a new baseline setting configuration:

1. Make sure that you selected the Source Site, and Service in the Add Threshold Configuration form .
2. Click **New** in the **Baseline Settings** tab.
   The Add Baseline Settings form opens.
3. Specify the following to configure the baseline deviation settings:

   You can expand or collapse the baseline deviation settings.

Field Name	Description
Metric	Select the metric for which you require to configure baseline deviation settings. The valid metrics for baseline deviation setting configuration are as below: ▪ RTT (ms) ▪ RTT (microS) ▪ Two Way Jitter (microS) ▪ Two Way Packet Loss (%) ▪ MOS

4. After you select the metric, the list of fields relevant to the selected metric appear. You can specify the following values to configure the baseline deviation settings:

Field Name	Description
Upper Baseline Limit Enabled	If you enable this option, NNM iSPI Performance for QA uses the Upper Baseline Limit Deviations-Above Average field value to determine the number of times there is a **standard deviation** above the average value. If you disable this option NNM iSPI Performance for QA does not consider the Upper Baseline Limit Deviations-Above Average field value. This field is not relevant and does not appear for MOS metric.
Upper Baseline Limit Deviations - Above Average	The number or count of **standard deviation** above the average values for NNM iSPI Performance for QA to determine the upper baseline limit. This field is not relevant and does not appear for MOS metric.
Lower Baseline Limit Enabled	If you enable this option, NNM iSPI Performance for QA uses the

Field Name	Description
	Lower Baseline Limit Deviations-Below Average field value to determine the number of times there is a **standard deviation** below the average value. If you disable this option NNM iSPI Performance for QA does not consider the Lower Baseline Limit Deviations - Below Average field value. This field appears only for MOS metric.
Lower Baseline Limit Deviations - Below Average	The number or count of **standard deviation** below the average values for NNM iSPI Performance for QA to determine the lower baseline limit. This field appears only for MOS metric.
Duration	The minimum time for which the standard deviation must persist to deviate from the configured Baseline Range before the baseline state transitions to Abnormal Range and generates an incident. The Polling Interval should be less than or equal to the Duration.
Window Duration	The window duration within which the Upper Baseline Limit or Lower Baseline Limit Deviation criteria must be met. The value must be greater than 0 (zero) and can be the same as the Duration value. NNM iSPI Performance for QA uses a sliding window, meaning that each time the Duration is reached, NNM iSPI Performance for QA drops the oldest polling cycle and adds the most recent.

5. Use any one of the following options to complete the task:

Icons	Description
Close	Closes the Add Baseline Settings form without saving the baseline setting information you have entered.
Save and Close	Saves the baseline setting information and closes the Add Baseline Settings form

6. Click **Save and Close** in the Add Baseline Settings form to save the baseline setting information.

7. Click **Save** or **Save and Close** in the Threshold Configuration form.

The new baseline settings configuration is not saved unless you click **Save** or **Save and Close** in the Threshold Configuration form.

NNM iSPI Performance for QA applies the following rules while configuring baseline deviation settings for a **site** using this form:

- You can configure baseline settings only for the QA probes of the existing sites.
- You must select a source site, service, and metric to configure the baseline settings.
- Optionally, you can select the destination site
- If you do not specify a destination site for the baseline setting, the configuration is applied to all the QA probes of the destination sites from the source sites.
- You cannot configure baseline settings for remote sites.

Editing Threshold Configuration

To edit a threshold configuration:

1. Launch the QA Probe Threshold Configuration form.
2. Select the threshold configuration settings to modify, and click **Edit**.

   The Edit Threshold Configuration form opens.

   When you edit a QA Group threshold configuration setting, NNM iSPI Performance for QA enables you to edit only the metric values, and does not enables you to edit the following fields:

   - Threshold Type
   - Order
   - Source Site
   - Destination Site
   - Service

   If you want to edit the above mentioned fields, delete the existing configuration settings and configure a new threshold setting, based on your requirements.
3. Follow the steps in Editing an Existing Threshold to modify the metric values.

   You can view two tabs; **Threshold Settings** and **Baseline Settings**.

You can view the following options when you click on the **Threshold Settings** tab.

Icons Available in the Threshold Settings Tab	Description
New	Adds a new threshold for the site
Edit	Edits the selected threshold for the site
Delete	Deletes the selected threshold for the site
Refresh	Retrieves the last saved threshold configuration from the database and displays the data
✕ Delete All Delete All	Deletes all the threshold configured for the site

You can view the following options when you click on the **Baseline Settings** tab:

Icons Available in the Baseline Settings Tab	Description
New	Adds a new baseline deviation setting for the site
Edit	Edits the baseline deviation setting for the site
✕ Delete	Deletes the selected baseline deviation settings for the site
⟳ Refresh	Retrieves the last saved baseline deviation setting configuration from the database and displays the data
✕ Delete All Delete All	Deletes all the baseline deviation settings configured for the site

Editing an Existing Threshold Setting Using the Threshold Configuration Form

To edit an existing threshold setting:

1. Specify all the mandatory fields in Edit Threshold Configuration form

   a. Select the metric, and click **Edit** in the **Threshold Settings** tab.

   The Edit Threshold Settings form opens.

   > **Caution:** You cannot edit the metric type and threshold type (Time based or Count based). If you want to edit the metric type or threshold type (Time based or Count based), delete the existing configuration settings and configure a new threshold settings, based on your requirements.

2. You can specify the following values to edit the threshold:

   For probe based threshold configuration, you can view the threshold that was configured for the Remote QA probes, but you **cannot** configure thresholds for **Remote QA Probes**[1].

Field Name	Description
High Value	Enter the threshold value. This value indicates the maximum value above which the metric will be considered to have violated the Nominal range. For Packet Loss metric, enter the High Value in percentage.
High Value Rearm	Enter the high value rearm for the threshold. For Packet Loss metric, enter the High Value Rearm in percentage. The High Value Rearm is used to indicate the end of the high threshold state and NNM iSPI Performance for QA clears the incident once it reaches below this value. The high value rearm must always be lower than the high value. **Example** For the **Round Trip Time (RTT)** you must generate an incident when the RTT is 150 and clear the incident when the RTT value comes down to 100. Set the following values for the threshold: ▪ High Value: `150` ▪ High Value Rearm: `100` This value enables you to be aware when a network performance problem starts to improve.

[1] Remote QA probes are primarily discovered and polled at the regional manager.

Field Name	Description
Low Value	Enter the low threshold value. This value indicates the maximum value below which the metric will be considered to have violated the Nominal range.
Low Value Rearm	Enter the low value rearm for the threshold. For Packet Loss metric, enter the Low Rearm Value in percentage. The low value rearm is used to indicate the end of the low threshold state and NNM iSPI Performance for QA clears the incident once it reaches above this value. The low value rearm must be greater than the low value. **Example** For the **Mean Opinion Score (MOS)** you must generate an incident when the MOS score is 3 and clear the incident when the score is improved to 4.5. Set the following values for the threshold: ▪ Low Value: `3` ▪ Low Value Rearm: `4.5` This value enables you to be aware when a network performance problem starts to improve.

The following fields appear, if the Type is Count Based, and you can modify the information if required

Field Name	Description
Trigger Count	Specify after how many consecutive threshold violations NNM iSPI Performance for QA must alert the operator by transitioning the threshold state to High or Low accordingly.

The following fields appear if the Type is Time Based, and you can modify the information if required:

Field Name	Description
High Duration	Enter the minimum amount of time for which the QA probes must report high metric values. For example if you specify this value to be 20 minutes for Packet Loss Percentage metric, NNM iSPI Performance for QA considers the threshold to be violated if the Packet Loss Percentage is high for 20 minutes. You define the high threshold value in the High Value field.

Field Name	Description
	Set the polling interval as less than or equal to the high duration value.
High Duration Window	Define a window for the high duration value. For example, if you specify this value to be 30 minutes for Packet Loss Percentage metric, NNM iSPI Performance for QA considers the threshold to be violated if the Packet Loss Percentage is high for 20 out of 30 minutes. You define the high threshold value in the High Value field and the high duration in the High Duration field. NNM iSPI Performance for QA drops the oldest polled value and adds the most recent value each time the metric value reaches the High Duration Window. This method is called Sliding Window method, where only the newest set of values are considered for the thresholds. While specifying this value follow these guidelines: ▪ This value must be greater than 0 (zero). ▪ This value can be same as the High Duration value.

The following fields appear, if you selected the Type as Time Based and the metric as MOS:

You can modify the information if required.

Low Duration	Enter the minimum amount of time for which the QA probes must report low metric values. For example if you specify this value to be 20 minutes for MOS metric, NNM iSPI Performance for QA considers the threshold to be violated if the MOS is low for 20 minutes. You define the high threshold value in the Low Value field. Set the polling interval as less than or equal to the low duration value.
Low Duration Window	Define a window for the low duration value. For example, if you specify this value to be 30 minutes for MOS metric, NNM iSPI Performance for QA considers the threshold to be violated if the MOS is low for 20 out of 30 minutes. You define the low threshold value in the Low Value field and the low duration in the Low Duration field. NNM iSPI Performance for QA drops the oldest polled value

	and adds the most recent value each time the metric value reaches the Low Duration Window. This method is called Sliding Window method, where only the newest set of values are considered for the thresholds. While specifying this value follow these guidelines: ▪ This value must be greater than 0 (zero). ▪ This value can be same as the Low Duration value.

3. Select the following to generate an incident when the time based threshold or count based threshold value is violated:

Field Name	Description
Generate Incident	Select this option if you want NNM iSPI Performance for QA to generate an incident for count based or time based threshold violations. By default this option is selected.

4. Use any one of the following options to complete the task:

Icons	Description
Close	Closes the Add Threshold Configuration form without saving the threshold information you have entered
Save and Close	Saves the threshold information and closes the Threshold Configuration form

5. Click **Refresh** in the Threshold Settings panel to view the changes.

6. Click **Save** or **Save and Close** in the Threshold Configuration form.

   The changes you have made in the threshold will not be saved unless you click **Save** or **Save and Close** in the Threshold Configuration form.

NNM iSPI Performance for QA applies the following rules while updating thresholds:

- You can define thresholds only for the existing sites.
- Any modification in the threshold directly updates the state poller.

For a Time Based Threshold configuration on probes, if the polling interval is greater than the High Duration or Low Duration value, the threshold cannot be configured for those QA probes. A list of these QA Probes, the UUID, and other details can be viewed in the log file, which is available in the following directory:

UNIX:*$NnmDataDir/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

Note: You can select all the threshold configured settings and click **Edit** option, but edit from will open for only one threshold group.

Editing Baseline Settings Using the Threshold Configuration Form

To edit a baseline setting configuration:

1. Make sure that you selected the Source Site, and Service in the Edit Threshold Configuration form if you are launching the form from Site Wide threshold configuration. You can ignore this step if you are launching this form from Probe based threshold configuration.
2. Select the baseline settings, and click ✎ **Edit** in the **Baseline Settings** panel.

   The Edit Baseline Settings form opens.
3. To edit the baseline deviations settings in the **Baseline Deviations Settings** panel:
   a. You can view the following details:

Field Name	Description
Metric	The metric for which you require to edit the baseline deviations settings configuration.

   b. You can edit the following baseline deviation settings configuration:

   The following fields appear depending on the metric:

Field Name	Description
Upper Baseline Limit Enabled	If you enable this option, NNM iSPI Performance for QA uses the Upper Baseline Limit Deviations-Above Average field value to determine the number of times there is a **standard deviation** above the average value. If you disable this option NNM iSPI Performance for QA does not consider the Upper Baseline Limit Deviations-Above Average field value. This field is not relevant and does not appear for MOS metric.
Upper Baseline Limit Deviations - Above Average	The number or count of **standard deviation** above the average values for NNM iSPI Performance for QA to determine the upper baseline limit. This field is not relevant and does not appear for MOS metric.
Lower Baseline Limit Enabled	If you enable this option, NNM iSPI Performance for QA uses the Lower Baseline Limit Deviations-Below Average field value to determine the number of times there is a **standard deviation** below the average value.

Field Name	Description
	If you disable this option NNM iSPI Performance for QA does not consider the Lower Baseline Limit Deviations - Below Average field value. This field appears only for MOS metric.
Lower Baseline Limit Deviations - Below Average	The number or count of **standard deviation** below the average values for NNM iSPI Performance for QA to determine the lower baseline limit. This field appears only for MOS metric.
Duration	The minimum time for which the standard deviation must persist to deviate from the configured Baseline Range before the baseline state transitions to Abnormal Range and generates an incident. The Polling Interval should be less than or equal to the Duration.
Window Duration	The window duration within which the Upper Baseline Limit or Lower Baseline Limit Deviation criteria must be met. The value must be greater than 0 (zero) and can be the same as the Duration value. NNM iSPI Performance for QA uses a sliding window, meaning that each time the Duration is reached, NNM iSPI Performance for QA drops the oldest polling cycle and adds the most recent.

4. Use any one of the following options to complete the task:

Icons	Description
Close	Closes the Edit Baseline Settings form without saving the baseline setting information you have entered.
Save and Close	Saves the baseline setting information and closes the Edit Baseline Settings form

5. Click **Save and Close** in the Edit Baseline Settings form to save the baseline setting information.

6. Click **Save** or **Save and Close** in the Site Wide Threshold Configuration form.

The new baseline settings configuration is not be saved unless you click **Save** or **Save and Close** in the Threshold Configuration form.

NNM iSPI Performance for QA applies the following rules while configuring baseline deviation settings for a **site** using this form:

- You can configure baseline settings only for the QA probes of the existing sites.
- You must select a source site and service to configure the baseline settings.
- Optionally, you could select the destination site
- If you do not specify a destination site for the baseline setting, the configuration is applied to all the QA probes of the destination sites from the source sites.
- You cannot configure baseline settings for remote sites.

Deleting an Existing Threshold Using the Threshold Configuration Form

To delete an existing threshold:

1. Launch the QA Probe Threshold Configuration form.
2. Select a threshold in the **Threshold Settings** panel and click **Delete**.
3. Click **Refresh** in the Threshold Settings panel to view the changes.

The following changes occur after deleting a site based threshold configuration:

The selected thresholds configured for the metrics of the site are deleted and the threshold state is set to Threshold Not Set for the metric in the site. If any probe based configuration exists for the metric, the deletion of the site based threshold configuration has no impact on the probe based threshold configuration. The QA Probe status for the probes in the site is set to the most severe status. The incidents and conclusions are updated accordingly.

Example 1

Consider the following scenario:

Before Deleting the Threshold(s) Configured for the Site:

QA Probe Status : Major

Threshold State: High

Note: The threshold state is high for RTT and Packet Loss

Conclusion: RttThresholdStateHigh, TwoWayPktLossThresholdStateHigh, RTTAbnormal

After Deleting the Threshold(s) Configured for the Site:

QA Probe Status : Major

Threshold State: Threshold Not Set

Note: ` The threshold state is set to Threshold Not Set for RTT and Packet Loss.

Conclusion: RTTAbnormal

The QA Probe Status for the probes in the site is still set to Major as the Baseline State is in the Abnormal Range.

Example 2

Consider the following scenario:

Before Deleting the Threshold(s) Configured for the Site:

QA Probe Status : ▽ Major

Threshold State: High

Conclusion: TestUp[1], RttThresholdStateHigh,TwoWayPktLossThresholdStateHigh

After Deleting the Threshold(s) Configured for the Site:

QA Probe Status : ✓ Normal

Threshold State: ? Threshold Not Set

Conclusion: TestUp[2]

Deleting All Existing Thresholds Using the Threshold Configuration Form

To delete all the existing thresholds:

1. Launch the QA Probe Threshold Configuration form.
2. Click ✕ Delete All **Delete All**.
3. Click **Refresh** in the Threshold Settings panel to view the changes.

The following changes occur after deleting a site based threshold configuration:

The thresholds configured for the site is deleted and the threshold state is set to ? Threshold Not Set for the probes in the site for which you have not configured a probe based threshold configuration. The Probe status of the QA probes in the site is set to the most severe status. The incidents and conclusions are updated accordingly.

Example 1

Consider the following scenario:

Before Deleting all the Thresholds Configured for the Site

QA Probe Status : ▽ Major

Threshold State: High

[1] When both Administrative and Operational states are up.
[2] When both Administrative and Operational states are up.

> **Note:** The threshold state is high for RTT and Packet Loss

Conclusion: RttThresholdStateHigh, TwoWayPktLossThresholdStateHigh, RTTAbnormal

After Deleting all the Thresholds Configured for the Site:

QA Probe Status : Major

Threshold State: Threshold Not Set

> **Note:** The threshold state is set to Threshold Not Set for RTT and Packet Loss.

Conclusion: RTTAbnormal

The QA Probe Status of the probes in the site is still set to Major as the Baseline State is in the Abnormal Range.

Example 2

Consider the following scenario:

Before Deleting all the Thresholds Configured for the Site

QA Probe Status : Major

Threshold State: High

Conclusion: TestUp[1], RttThresholdStateHigh,TwoWayPktLossThresholdStateHigh

After Deleting all the Thresholds Configured for the Site:

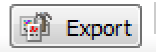
QA Probe Status : Normal

Threshold State: Threshold Not Set

Conclusion: TestUp[2]

Exporting a Threshold

To export the existing threshold configurations to an XML file:

1. Launch the QA Probe Threshold Configuration form.
2. Click 

Export.

[1] When both Administrative and Operational states are up.
[2] When both Administrative and Operational states are up.

3. Type the file name where you want to export the existing threshold configuration in the user prompt dialog.

   You must type the file name with full path information; for example, `C:\temp\threshold_conf.xml`

   If you type the XML file name without entering the absolute path, by default the file gets saved in the following directory:

   UNIX: *$NnmDataDir/shared/qa/conf*

   Windows : *%NnmDataDir%\shared\qa\conf*

4. Click **OK** in the user prompt dialog.

You can also export the existing threshold configuration using the following command line utility:

UNIX: *$NnmInstallDir/bin/nmsqathresholdconfigutil.ovpl –u <username> –p <password> –export <filename>*

Windows: *%NnmInstallDir%\bin\nmsqathresholdconfigutil.ovpl –u <username> –p <password> –export <filename>*

The threshold export utility does not export a threshold unless the threshold is associated with at least one site.

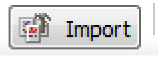
If the threshold export fails, check the following log files:

UNIX:*$NnmDataDir/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

Importing Thresholds

To import threshold configurations from an XML file:

1. [Launch the QA Probe Threshold Configuration form](#).
2. Click 

 Import.
3. In the user prompt dialog, enter the file name from where you want to import the threshold configuration information.

   You must enter the file name with full path information; for example, `C:\temp\threshold_conf.xml`

4. Click **OK** in the user prompt dialog.

   If a threshold is already defined and displayed in the Site Wide Threshold Settings panel, the import utility does not import the configuration information for this threshold from the XML file.

You can also import threshold configuration information using the following command line utility:

UNIX: *$NnmInstallDir/bin/nmsqathresholdconfigutil.ovpl –u <username> –p <password> –import <filename>*

Windows: *%NnmInstallDir%\bin\nmsqathresholdconfigutil.ovpl –u <username> –p <password> –import <filename>*

If the threshold import fails, check the following log files:

UNIX: *$NnmDataDir/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

NNM iSPI Performance for QA for QA Groups Threshold Configuration

NNM iSPI Performance for QA enables you to track the health and performance of the QA groups, which you have configured and discovered. You can configure thresholds for both QA probes and CBQoS probes, and create incidents whenever the performance value assigned to the QA groups breaches the threshold.

NNM iSPI Performance for QA performs the following actions, if a threshold is breached:

- Sets the QA Groups (QA Probes or CBQoS) probes' status to major.
- Creates an incident for the violated threshold.
- Retains the threshold state as Nominal, or sets the threshold state to High or Low depending on the count based, or time based threshold configuration.

You can monitor the QA Groups entities for both QA Probes and CBQoS, and generate an incident based on the count based threshold configuration or time based threshold configuration.

Threshold Configuration

Count Based Threshold Configuration

You can generate an incident based on the count or number of consecutive times a metric violates the threshold value. You can define this count in the Threshold Configuration form, and you can specify to trigger an incident when the threshold violation exceeds this count.

Time Based Threshold Configuration

Time based threshold configuration enables you to raise an alert when the threshold breached state persists for more than a specific time period. This is derived by specifying X as the duration of time in minutes when the metric is in a threshold breached state within Y number of minutes specified in the sliding window. Based on your choice, you can trigger an incident if required.

Example for Time Based Threshold Configuration

Consider a scenario, where the polling interval is 5 minutes; High duration is 10 minutes; and High Duration Window is 60 minutes. In this scenario, an incident is generated whenever the High Duration exceeds 10 minutes within the 60 minute duration. NNM iSPI Performance for QA uses a sliding window wherein each time the High Duration (10 minutes) is reached, NNM iSPI Performance for QA drops the oldest polled value (first 5 minutes) and adds the most recent (between 60 to 65 minutes). This procedure continues and enables you to determine time based threshold violation.

You can make utmost use of the Time based threshold violation by ensuring that the duration specified in the sliding window is greater than or equal to the polling interval.

Baseline Settings Configuration

Baseline Deviation Settings Configuration

Apart from the time based and count based threshold configuration, you can also do a baseline monitoring based on the baseline deviation setting configuration in NNM iSPI Performance for QA. You can do a baseline deviation setting configuration for the selected probe, service, and metric. An incident is generated and the baseline state transitions to Abnormal Range only if it meets all the criteria listed below:

- Exceeds the count or the number of standard deviation that is above the average value for the metric, or exceeds the count or the number of standard deviation that is below the average value for the metric.This count is specified in the Upper Baseline Limit Deviations or the Lower Baseline Limit Deviations in the baseline deviation settings configuration
- Exceeds the duration for which the upper or lower baseline deviation persists in the specified sliding window duration

Adding New QA Group Threshold Settings

To add a new QA Group threshold:

1. Launch the Threshold Configuration Form
2. Click **New** in the Threshold Configuration form panel. The threshold configuration form opens.
3. Specify the following to configure the threshold:

Field Name	Description
Threshold Type	In the Threshold Type, select **QA Groups Based**.
Order	Specify a numeric value. NNM iSPI Performance for QA checks the configuration settings in the order you define (lowest number first).
QA Group	Lists the configured and discovered QA Probes that belong to the QA Group. You can select any one of the configured and discovered QA Groups, from the drop down list to configure the threshold.
Service	The type of the discovered QA probe. This field is mandatory. NNM iSPI Performance for QA recognizes the following QA probe types: • **UDP Echo** • **ICMP Echo** • **UDP** • **TCP Connect** • **VoIP**

You can view the two tabs; Threshold Settings and Baseline Settings.

3. You can perform the following tasks when you click on the **Threshold Settings** tab.

Icons Available in the Threshold Settings Tab	Description
New	Creates a new QA Groups threshold
Edit	Edits an existing QA Groups threshold
✗ Delete	Deletes an existing QA Groups threshold
Refresh	Retrieves the last saved threshold configuration from the database and displays the data
✗ Delete All Delete All	Deletes all existing QA Groups thresholds

4. You can perform the following tasks when you click on the **Baseline Settings** tab.

Icons Available in the Baseline Settings Tab	Description
New	Creates a new QA Group threshold for baseline setting
Edit	Edits / overrides an existing QA Group threshold for baseline settings
✗ Delete	Deletes an existing QA Group threshold for baseline settings
Refresh	Retrieves the last saved threshold configuration from the database and displays the data
✗ Delete All Delete All	Deletes all existing QA Group thresholds for baseline settings

Creating New QA Group for QA Probe Threshold Setting

To add a new threshold:

1. Specify all the mandatory fields in the Adding New QA Groups Threshold Settings
2. Click **New** in the **Threshold Settings** tab.

   The Add Threshold Settings form opens.
3. Specify the following to configure the threshold settings:

Field Name	Description
Type	Select the type of threshold violation. The valid types are Count Based and Time Based.
Metric	Select the metric for which you are configuring the threshold. The metrics are populated based on the service.

4. After you select the metric to configure the threshold, the list of fields relevant to the selected metric appear. You can specify the following values to configure the new threshold:

Field Name	Description
High Value	Enter the threshold value. This value indicates the maximum value above which the metric will be considered to have violated the Nominal range. For Packet Loss metric, enter the High Value in percentage.
High Value Rearm	Enter the high value rearm for the threshold. For Packet Loss metric, enter the High Value Rearm in percentage. The High Value Rearm is used to indicate the end of the high threshold state and NNM iSPI Performance for QA clears the incident once it reaches below this value. The high value rearm must always be lower than the high value. **Example** For the **Round Trip Time (RTT)** you must generate an incident when the RTT is 150 and clear the incident when the RTT value comes down to 100. Set the following values for the threshold: ▪ High Value: `150` ▪ High Value Rearm: `100`

Field Name	Description
	This value enables you to be aware when a network performance problem starts to improve.
Low Value	Enter the low threshold value. This value indicates the maximum value below which the metric will be considered to have violated the Nominal range.
Low Value Rearm	Enter the low value rearm for the threshold. For Packet Loss metric, enter the Low Rearm Value in percentage. The low value rearm is used to indicate the end of the low threshold state and NNM iSPI Performance for QA clears the incident once it reaches above this value. The low value rearm must be greater than the low value. **Example** For the **Mean Opinion Score (MOS)** you must generate an incident when the MOS score is 3 and clear the incident when the score is improved to 4.5. Set the following values for the threshold: - Low Value: `3` - Low Value Rearm: `4.5` This value enables you to be aware when a network performance problem starts to improve.

The following field appears, if you have selected the Type as Count Based:

Field Name	Description
Trigger Count	Specify after how many consecutive threshold violations NNM iSPI Performance for QA must alert the operator by transitioning the threshold state to High or Low accordingly.

The following fields appear if you selected the Type as Time Based:

Field Name	Description
High Duration	Enter the minimum amount of time for which the QA probes must report high metric values. For example if you specify this value to be 20 minutes for Packet Loss Percentage metric, NNM iSPI Performance for QA considers the threshold to be violated if the Packet Loss Percentage is high for 20 minutes.

Field Name	Description
	You define the high threshold value in the High Value field. Set the polling interval as less than or equal to the high duration value.
High Duration Window	Define a window for the high duration value. For example, if you specify this value to be 30 minutes for Packet Loss Percentage metric, NNM iSPI Performance for QA considers the threshold to be violated if the Packet Loss Percentage is high for 20 out of 30 minutes. You define the high threshold value in the High Value field and the high duration in the High Duration field. NNM iSPI Performance for QA drops the oldest polled value and adds the most recent value each time the metric value reaches the High Duration Window. This method is called Sliding Window method, where only the newest set of values are considered for the thresholds. While specifying this value follow these guidelines: ▪ This value must be greater than 0 (zero). ▪ This value can be same as the High Duration value.

The following fields appear if you have selected the Type as Time Based and the metric as MOS:

Low Duration	Enter the minimum amount of time for which the QA probes must report low metric values. For example if you specify this value to be 20 minutes for MOS metric, NNM iSPI Performance for QA considers the threshold to be violated if the MOS is low for 20 minutes. You define the high threshold value in the Low Value field. Set the polling interval as less than or equal to the low duration value.
Low Duration Window	Define a window for the low duration value. For example, if you specify this value to be 30 minutes for MOS metric, NNM iSPI Performance for QA considers the threshold to be violated if the MOS is low for 20 out of 30 minutes. You define the low threshold value in the Low Value field and the low duration in the Low Duration field.

	NNM iSPI Performance for QA drops the oldest polled value and adds the most recent value each time the metric value reaches the Low Duration Window. This method is called Sliding Window method, where only the newest set of values are considered for the thresholds. While specifying this value follow these guidelines: ▪ This value must be greater than 0 (zero). ▪ This value can be same as the Low Duration value.

5. Select the following to generate an incident when the time based threshold or count based threshold value is violated:

Field Name	Description
Generate Incident	Select this option if you want NNM iSPI Performance for QA to generate an incident for count based or time based threshold violations. By default this option is selected.

6. Use any one of the following options to complete the task:

Icons	Description
Close	Closes the Add Threshold Configuration form without saving the threshold information you have entered.
Save and Close	Saves the threshold information and closes the Threshold Configuration form

7. Click **Refresh** to view the changes.

8. Click **Save** or **Save and Close** in the Threshold Configuration form.

Make sure that you click **Save** or **Save and Close** in the Threshold Configuration form.

Creating New QA Group Baseline Threshold Settings

To add a new baseline setting configuration:

1. Specify all the mandatory fields in the Adding New QA Group Threshold Settings
2. Click **New** in the **Baseline Settings** tab.
   The Add Baseline Settings form opens.
3. Specify the following to configure the baseline deviation settings:

Field Name	Description
Metric	Select the metric for which you require to configure baseline deviation settings. The valid metrics for baseline deviation setting configuration are as below: ▪ RTT (ms) ▪ RTT (microS) ▪ Two Way Jitter (microS) ▪ Two Way Packet Loss (%) ▪ MOS

4. After you select the metric, the list of fields relevant to the selected metric appear. You can specify the following values to configure the baseline deviation settings:

Field Name	Description
Upper Baseline Limit Enabled	If you enable this option, NNM iSPI Performance for QA uses the Upper Baseline Limit Deviations-Above Average field value to determine the number of times there is a **standard deviation** above the average value. If you disable this option NNM iSPI Performance for QA does not consider the Upper Baseline Limit Deviations-Above Average field value. This field is not relevant and does not appear for MOS metric.
Upper Baseline Limit Deviations - Above Average	The number or count of **standard deviation** above the average values for NNM iSPI Performance for QA to determine the upper baseline limit. This field is not relevant and does not appear for MOS metric.
Lower Baseline Limit Enabled	If you enable this option, NNM iSPI Performance for QA uses the Lower Baseline Limit Deviations-Below Average field value to determine the number of times there is a **standard deviation** below the average value.

Field Name	Description
	If you disable this option NNM iSPI Performance for QA does not consider the Lower Baseline Limit Deviations - Below Average field value. This field appears only for MOS metric.
Lower Baseline Limit Deviations - Below Average	The number or count of **standard deviation** below the average values for NNM iSPI Performance for QA to determine the lower baseline limit. This field appears only for MOS metric.
Duration	The minimum time for which the standard deviation must persist to deviate from the configured Baseline Range before the baseline state transitions to Abnormal Range and generates an incident. The Polling Interval should be less than or equal to the Duration.
Window Duration	The window duration within which the Upper Baseline Limit or Lower Baseline Limit Deviation criteria must be met. The value must be greater than 0 (zero) and can be the same as the Duration value. NNM iSPI Performance for QA uses a sliding window, meaning that each time the Duration is reached, NNM iSPI Performance for QA drops the oldest polling cycle and adds the most recent.

5. Use any one of the following options to complete the task:

Icons	Description
Close	Closes the Add Baseline Settings form without saving the baseline setting information you have entered.
Save and Close	Saves the baseline setting information and closes the Add Baseline Settings form

6. Click **Save and Close** in the Add Baseline Settings form to save the baseline setting information.

7. Click **Save** or **Save and Close** in the Threshold Configuration form.

Make sure you click **Save** or **Save and Close** in the Threshold Configuration form.

Editing the QA Group Threshold Settings

To edit the QA Group threshold settings:

1. Launch the QA Probe Threshold Configuration Form

2. Select the threshold configuration settings to modify, and click **Edit** in the Threshold Configuration form panel. The edit threshold configuration form opens.

   When you edit the QA Group threshold configuration settings, NNM iSPI Performance for QA enables you to edit only the metric values, and does not enables you to edit the following fields:

   - Threshold type
   - Order
   - QA Group
   - Service

   If you want to edit the above mentioned fields, delete the existing configuration settings and configure a new threshold setting, based on your requirements.

3. Follow the steps in Editing an Existing Threshold to modify the metric values.

You can view the two tabs; **Threshold Settings** and **Baseline Settings**.

You can perform the following tasks when you click on the **Threshold Settings** tab.

Icons Available in the Threshold Settings Tab	Description
New	Creates a new QA Group threshold
Edit	Edits an existing QA Group threshold
Delete	Deletes an existing QA Group threshold
Refresh	Retrieves the last saved threshold configuration from the database and displays the data
Delete All Delete All	Deletes all existing QA Group thresholds

4. You can perform the following tasks when you click on the **Baseline Settings** tab.

Icons Available in the Baseline Settings Tab	Description
New	Creates a new QA Group baseline threshold setting
Edit	Edits / overrides an existing QA Group baseline threshold settings
Delete	Deletes an existing QA Group baseline threshold settings
Refresh	Retrieves the last saved threshold configuration from the database and displays the data

Icons Available in the Baseline Settings Tab	Description
 Delete All	Deletes all existing QA Group baseline threshold settings

Editing an Existing QA Group Threshold Setting

To edit an existing threshold setting:

1. Specify all the mandatory fields in Editing the QA Group Threshold Settings.
2. Select the metric, and click ✎ **Edit** in the **Threshold Settings** tab.

   The Edit Threshold Settings form opens.

   You cannot edit the metric type and threshold type (Time based or Count based). If you want to edit the metric type or threshold type (Time based or Count based), delete the existing configuration settings and configure a new threshold settings, based on your requirements
3. You can specify the following values to edit the threshold:

Field Name	Description
High Value	Enter the threshold value. This value indicates the maximum value above which the metric will be considered to have violated the Nominal range. For Packet Loss metric, enter the High Value in percentage.
High Value Rearm	Enter the high value rearm for the threshold. For Packet Loss metric, enter the High Value Rearm in percentage. The High Value Rearm is used to indicate the end of the high threshold state and NNM iSPI Performance for QA clears the incident once it reaches below this value. The high value rearm must always be lower than the high value. **Example** For the **Round Trip Time (RTT)** you must generate an incident when the RTT is 150 and clear the incident when the RTT value comes down to 100. Set the following values for the threshold: ▪ High Value: `150` ▪ High Value Rearm: `100` This value enables you to be aware when a network performance problem starts to improve.
Low Value	Enter the low threshold value. This value indicates the maximum value below which the metric will be considered to have violated the Nominal range.
Low Value Rearm	Enter the low value rearm for the threshold. For Packet Loss metric, enter the Low Rearm Value in percentage. The low value rearm is used to indicate the end of the low threshold

Field Name	Description
	state and NNM iSPI Performance for QA clears the incident once it reaches above this value. The low value rearm must be greater than the low value. **Example** For the **Mean Opinion Score (MOS)** you must generate an incident when the MOS score is 3 and clear the incident when the score is improved to 4.5. Set the following values for the threshold: ▪ Low Value: `3` ▪ Low Value Rearm: `4.5` This value enables you to be aware when a network performance problem starts to improve.

The following field appears, if you have selected the Type as Count Based:

Field Name	Description
Trigger Count	Specify after how many consecutive threshold violations NNM iSPI Performance for QA must alert the operator by transitioning the threshold state to High or Low accordingly.

The following fields appear if you selected the Type as Time Based:

Field Name	Description
High Duration	Enter the minimum amount of time for which the QA probes must report high metric values. For example if you specify this value to be 20 minutes for Packet Loss Percentage metric, NNM iSPI Performance for QA considers the threshold to be violated if the Packet Loss Percentage is high for 20 minutes. You define the high threshold value in the High Value field. Set the polling interval as less than or equal to the high duration value.
High Duration Window	Define a window for the high duration value. For example, if you specify this value to be 30 minutes for Packet Loss Percentage metric, NNM iSPI Performance for QA considers the threshold to be violated if the Packet Loss Percentage is high for 20 out of 30 minutes.

Field Name	Description
	You define the high threshold value in the High Value field and the high duration in the High Duration field. NNM iSPI Performance for QA drops the oldest polled value and adds the most recent value each time the metric value reaches the High Duration Window. This method is called Sliding Window method, where only the newest set of values are considered for the thresholds. While specifying this value follow these guidelines: ▪ This value must be greater than 0 (zero). ▪ This value can be same as the High Duration value.

The following fields appear if you have selected the Type as Time Based and the metric as MOS:

Low Duration	Enter the minimum amount of time for which the QA probes must report low metric values. For example if you specify this value to be 20 minutes for MOS metric, NNM iSPI Performance for QA considers the threshold to be violated if the MOS is low for 20 minutes. You define the high threshold value in the Low Value field. Set the polling interval as less than or equal to the low duration value.
Low Duration Window	Define a window for the low duration value. For example, if you specify this value to be 30 minutes for MOS metric, NNM iSPI Performance for QA considers the threshold to be violated if the MOS is low for 20 out of 30 minutes. You define the low threshold value in the Low Value field and the low duration in the Low Duration field. NNM iSPI Performance for QA drops the oldest polled value and adds the most recent value each time the metric value reaches the Low Duration Window. This method is called Sliding Window method, where only the newest set of values are considered for the thresholds. While specifying this value follow these guidelines: ▪ This value must be greater than 0 (zero). ▪ This value can be same as the Low Duration value.

4. Select the following to generate an incident when the time based threshold or count based threshold value is violated:

Field Name	Description
Generate Incident	Select this option if you want NNM iSPI Performance for QA to generate an incident for count based or time based threshold violations. By default this option is selected.

5. Use any one of the following options to complete the task:

Icons	Description
Close	Closes the Edit Threshold Configuration form without saving the threshold information you have entered.
Save and Close	Saves the threshold information and closes the Threshold Configuration form

6. Click **Refresh** to view the changes.

7. Click **Save** or **Save and Close** in the Threshold Configuration form.

   Make sure you click **Save** or **Save and Close** in the Threshold Configuration form, to save the settings that you have edited.

Editing the QA Group Baseline Threshold Settings

To edit the threshold for baseline settings:

1. Launch the QA Probe Threshold Configuration form.

2. Select the configured threshold to modify, and Click ✎ **Edit** in the **Baseline Settings** tab. The Edit Baseline Settings form opens.

   When you edit the QA Group baseline threshold configuration settings, NNM iSPI Performance for QA enables you to edit only the metric values, and does not enables you to edit the following fields:

   - Threshold type
   - Order
   - QA Group
   - Service

   If you want to edit the above mentioned fields, delete the existing configuration settings and configure a new threshold setting, based on your requirements.

3. Follow the steps in Editing the QA Group Baseline Threshold Setting, to modify the metric values.

Editing the QA Group for QA Probe Baseline Threshold Settings

To edit the threshold for baseline settings:

1. Specify all the mandatory fields in the Editing the QA Group Baseline Threshold Settings .

2. Select the metric in the **Baseline Settings** tab, and Click **Edit**.
   The Edit Baseline Settings form opens.

You cannot edit the metric type and threshold type (Time based or Count based). If you want to edit the metric type or threshold type (Time based or Count based), delete the existing configuration settings and configure a new threshold settings, based on your requirements.

3. You can specify the following to edit the baseline deviation settings:

Field Name	Description
Upper Baseline Limit Enabled	If you enable this option, NNM iSPI Performance for QA uses the Upper Baseline Limit Deviations-Above Average field value to determine the number of times there is a **standard deviation** above the average value. If you disable this option NNM iSPI Performance for QA does not consider the Upper Baseline Limit Deviations-Above Average field value. This field is not relevant and does not appear for MOS metric.
Upper Baseline Limit Deviations - Above Average	The number or count of **standard deviation** above the average values for NNM iSPI Performance for QA to determine the upper baseline limit. This field is not relevant and does not appear for MOS metric.
Lower Baseline Limit Enabled	If you enable this option, NNM iSPI Performance for QA uses the Lower Baseline Limit Deviations-Below Average field value to determine the number of times there is a **standard deviation** below the average value. If you disable this option NNM iSPI Performance for QA does not consider the Lower Baseline Limit Deviations - Below Average field value. This field appears only for MOS metric.
Lower Baseline Limit Deviations - Below Average	The number or count of **standard deviation** below the average values for NNM iSPI Performance for QA to determine the lower baseline limit. This field appears only for MOS metric.

Field Name	Description
Duration	The minimum time for which the standard deviation must persist to deviate from the configured Baseline Range before the baseline state transitions to Abnormal Range and generates an incident. The Polling Interval should be less than or equal to the Duration.
Window Duration	The window duration within which the Upper Baseline Limit or Lower Baseline Limit Deviation criteria must be met. The value must be greater than 0 (zero) and can be the same as the Duration value. NNM iSPI Performance for QA uses a sliding window, meaning that each time the Duration is reached, NNM iSPI Performance for QA drops the oldest polling cycle and adds the most recent.

4. Use any one of the following options to complete the task:

Icons	Description
Close	Closes the Edit Baseline Settings form without saving the baseline setting information you have entered.
Save and Close	Saves the baseline setting information and closes the Edit Baseline Settings form

5. Click **Save and Close** in the Edit Baseline Settings form to save the baseline setting information.

6. Click **Save** or **Save and Close** in the Threshold Configuration form.

Make sure you click **Save** or **Save and Close** in the Threshold Configuration form, to save the settings that you have edited..

Deleting an Existing QA Group for QA Probe Threshold Setting

To delete an existing QA Group for QA Probe threshold:

1. Launch the QA Probe Threshold Configuration Form.
2. Select one or more configured QA Group threshold settings in the **Threshold Settings** panel and click **Delete**.
3. Click **Refresh** in the Threshold Configuration panel to view the changes.

However, NNM iSPI Performance for QA does not delete the incidents that are already generated for an existing threshold.

Deleting all Existing QA Group Thresholds

To delete all existing QA Group for QA probe thresholds:

1. Launch the QA Probe Threshold Configuration Form.
2. Click ✕ Delete All
3. Click ⟳ **Refresh** in the Threshold Configuration panel to view the changes.

However, NNM iSPI Performance for QA does not delete the incidents that are already generated for an existing threshold.

Deleting an Existing QA Group for QA Probe Baseline Threshold

To delete an existing QA Group for QA Probe baseline threshold:

1. Launch the QA Probe Threshold Configuration Form.
2. Select **Baseline Settings** tab.
3. Select one or more threshold settings in the **Baseline Settings** panel, and Click ✕ **Delete**
4. Click ⟳ **Refresh** in the Baseline panel to view the changes.

However, NNM iSPI Performance for QA does not delete the incidents that are already generated for an existing threshold.

Deleting all Existing QA Group for QA Probe Baseline Thresholds

To delete all existing QA Group for baseline thresholds:

1. Launch the QA Probe Threshold Configuration Form.
2. Select **Baseline Settings** tab, and Click ✕ Delete All
3. Click ⟳ **Refresh** in the Baseline panel to view the changes.

However, NNM iSPI Performance for QA does not delete the incidents that are already generated for an existing threshold.

Importing the Existing QA Group Thresholds

To import the existing QA Group for QA Probe thresholds configurations from an XML file:

1. Launch the QA Probe Threshold Configuration Form.
2. Click Import **Import**.

3. In the user prompt dialog, enter the file name from where you want to import the QA Groups for QA Probe thresholds configuration information.

   You must enter the file name with full path information; for example, `C:\temp\threshold_conf.xml`

4. Click **OK** in the user prompt dialog.

   If a threshold is already defined and displayed in the Threshold Configuration panel, the import utility does not import the configuration information for this threshold from the XML file.

You can also import the QA Groups for QA Probe thresholds configuration information using the following command line utility:

UNIX: *$NnmInstallDir/bin/nmsqathresholdconfigutil.ovpl –u <username> –p <password> –import –type qaprobe <filename>*

Windows: *%NnmInstallDir%\bin\nmsqathresholdconfigutil.ovpl –u <username> –p <password> –import –type qaprobe <filename>*

If the threshold import fails, check the following log files:

UNIX: *$NnmDataDir/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

Exporting the Existing QA Group Thresholds

To export the existing QA Group for QA Probe threshold configurations to an XML file:

1. Launch the QA Probe Threshold Configuration Form.
2. Click Export **Export**.
3. Type the file name where you want to export the existing QA Groups for QA Probe threshold configurations in the user prompt dialog.

   You must type the file name with full path information; for example, `C:\temp\threshold_conf.xml`

   If you type the XML file name without entering the absolute path, by default the file gets saved in the following directory:

   UNIX: *$NnmDataDir/shared/qa/conf*

   Windows : *%NnmDataDir%\shared\qa\conf*

4. Click **OK** in the user prompt dialog.

You can also export the existing QA Groups for QA Probe threshold configurations using the following command line utility:

UNIX: *$NnmInstallDir/bin/nmsqathresholdconfigutil.ovpl –u <username> –p <password> –export –type qaprobe <filename>*

Windows: *%NnmInstallDir%\bin\nmsqathresholdconfigutil.ovpl –u <username> –p <password> –export –type qaprobe <filename>*

The threshold export utility does not export a threshold unless the threshold is associated with a QA Group.

If the threshold export fails, check the following log files:

UNIX:*$NnmDataDir/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

Baseline Monitoring

Apart from the time based and count based threshold configuration, you can also do a baseline monitoring. Baseline monitoring is dynamic and updates the baseline state by comparing the extent of deviation from the average real-time data of the metric with the previous average values in a similar situation. For example, in a site during the peak hours or on week days, the RTT value is expected to exceed the high value frequently. In such a scenario, an incident need not be generated in the NNMi console. So, HP NNM iSPI Performance for Metrics Software enables you to compare the current threshold values during the peak hours with the previous set of values during the same peak hours. Based on the extent of deviation, you can configure to generate an incident in the NNMi console.

Baseline State

Baseline Monitoring sets a new state referred to as Baseline state for the QA probes. The valid baseline states for the QA probes are listed below:

- Normal Range - The metric is within the normal range of deviation
- Abnormal Range - The metric is either above or below the configured normal range of the deviation
- Unavailable -The computed value for the metric is not found in HP NNM iSPI Performance for Metrics Software
- Unset - No baseline is computed
- Not polled - The metric is not polled for baseline deviations
- No Polling Policy - No polling policy exists for this metric
- Threshold Agent Error - Indicates an error was returned while retrieving the data from NPS by the statepoller

Incidents

The following incidents are generated whenever there is a deviation from the configured normal range of deviation for the metric:

- RoundTripTimeAbnormal
- TwoWayPacketLossAbnormal
- TwoWayJitterAbnormal
- MeanOpinionScoreAbnormal

For information on incidents, see the topic QA Probes Form: Incidents Tab

HP Network Node Manager iSPI Performance for Quality Assurance Software Site Configuration

NNM iSPI Performance for QA enables you to monitor the network performance of different **network elements**[1] . Logically grouping the networking devices into **sites**[2] enables to monitor a similar set of QA probes.

Example

An enterprise network with branch offices is connected to the head office via WAN links. You can measure the network performances across all the offices and compare the network performance of the head office and the branch offices. This is useful to get an overview of health or the performance of the network.

You can configure QA probes between individual nodes or node groups and assign them to the sites. Also, you can configure the threshold for a site using the Threshold Configuration form. The threshold configured for a site is applied to all the QA probes of the site. This procedure takes very less time compared to configuring the threshold for each probe. You can view the measured value of the metrics for a site, which enables you to analyze the site and inter-site performance as well.

In a Global Network Management (GNM) environment, you can configure sites on a global manager or a regional manager. Based on this configuration, sites can be categorized as follows:

- Local Sites: Sites configured in the local NNMi management server are referred to as Local Sites. The local sites are owned by the manager on which it is configured.
- Remote Sites: The sites exported from the regional manager to the global manager are known as Remote Sites.

Whenever you create, edit, or delete a site in the regional manager, the changes are propagated to the global manager. You can export local sites, but you cannot export or delete remote sites. The advantage of exporting sites is that you need not configure the sites again.

Note: The sites configured and exported in the previous version of NNM iSPI Performance for QA can be imported and used in this version as well. See the topic Importing Sites Using Site Configuration Form for more information.

QA Probes Association

QA probes can be associated with either a local site or a remote site. Probes can be categorized as follows:

[1] Some examples of network elements are routers, switches, and phone connections

[2] A logical organization of networking devices. In the scope of enterprise networks, a site can be a logical grouping of networking devices generally situated in similar geographic location. The location can include a floor, building or an entire branch office or several branch offices which connect to head quarters or another branch office via WAN/MAN. Each site is uniquely identified by its name. In case of the service provider networks the Virtual Routing and Forwarding (VRF) on a Provider Edge (PE) router or a Customer Edge (CE) routers can be defined as a site.

- Local QA Probes: Local QA probes are QA probes owned by the local manager.
- Remote QA Probes: Remote QA probes are primarily discovered and polled at the regional manager

  If a QA probe associated with the remote site matches the local site, the QA probes of the local site overrides the remote site QA probes. In such instances, NNM iSPI Performance for QA overrides the site configuration and not the thresholds configured for the site.

  However, if there is no local site that matches the remote site, the QA probes are associated with the remote site.

Example

Consider a network managed in a GNM environment with branch offices 1 and 2 monitored by regional managers R1 and R2 with the global manager as G1. Consider a set of sites configured in R1 and R2, which are exported to G1. The probes obtained from R1 and R2 are consolidated in G1.

If the sites matching the remote probes are configured in G1, the QA probes of G1 override the remote site QA probes. If there is no match, the remote QA probes are available in G1.

Launching the Site Configuration Form

Perform the following steps to launch the site configuration form:

1. Log on to NNMi console using your username and password.

   You must have administrator privileges.
2. From the workspace navigation panel, select **Configuration** workspace.
3. Select **Quality Assurance Configuration Console**

   The console opens.
4. In the **Configuration** workspace, select **Site (QA Probes)**

   The Site Configuration form opens.
5. You can perform the following tasks using the Site Configuration form:

Icons Available in the Site Configuration Toolbar	Description
Close	Closes the Site Configuration form without saving the current configuration
Save	Saves the current configuration
Save and Close	Saves the current configuration and closes the Site Configuration form

Icons Available in the Site Configuration Toolbar	Description
Refresh	Retrieves the last saved site configuration from the database and displays the data in the Configured Sites panel of the Site Configuration form
Recompute Probes Associations Recompute Probe Associations	Re-assigns the QA probes to the sites
Export Export	Exports the existing sites
Import Import	Imports sites from an XML file
Icons Available in the Global Settings Panel	**Description**
Enable Site Configuration	Enables to associate the configured sites to the probes
Icons Available in the Configured Sites Tab	**Description**
New	Adds a new site
Clone	Clones (copies) the selected site
Open	View an existing site
Edit	Edits an existing site
Delete	Deletes an existing site
Refresh	Refreshes the Configured Sites panel and displays the last saved site configurations
Delete All Delete All	Deletes all the existing sites

You can view the following in the **Configured Sites** panel:

Field Name	Description
Site Name	The name of the site configured.
Regional Manager	The regional manager where the sites are configured.
Ordering	The ordering number assigned to the site.

Field Name	Description
Node Group Rule	The node group rule configured for the site.
IP Range Rule	The IP range rule configured for the site.
Probe Name Rule	The probe name rule configured for the site.
VRF Name Rule	The VRF name rule configured for the site.

Adding a New Site Using the Site Configuration Form

To add a new site:

1. Launch the Site Configuration form.
2. Click **New** in the Configured Sites panel.

   The Add Site Configuration form opens.
3. Enter values for the following **site rules**[1]:
   a. Site Name:

      Enter the name you want to assign to the site.

      Site names are case sensitive. That is `SiteA` and `Sitea` are considered two different sites.

      Site names must be unique. Also, it is recommended to use unique site names across the sites in a GNM environment.

      Site names cannot contain **'** (single quotation marks).

      When you rename a site, it is identified by the new name.

   b. Ordering:

      A QA probe can be associated with only one source or destination site. Specify an ordering number for the site in this field to resolve conflicts in case a QA probe matches multiple sites. The NNM iSPI Performance for QA associates the QA probe with the site that has the lowest ordering number.

      If you do not provide an ordering number for the site, the NNM iSPI Performance for QA assigns default ordering. Default ordering for a site is given the lowest priority.

[1] Configuration associated to a site are called site rules. For example Node Group, Ordering, Test Name Pattern, etc are the site rules that are used to configure a site. The rules are prioritized inherently. The Node Group rule has the highest priority, the IP Address rule the second highest priority. Test Name Pattern rule has the third highest priority while the VRF Name rule has the the lowest priority among these four rules. Note that none of these rules have any dependency to each other. In other words, while creating a site, you can specify all or any of the the rules.

The QA probe is associated with the site which has the **lowest** ordering in case the QA probe matches multiple sites.

Example 1

The discovered QA probe name "`UDP QA probe from Site A over WAN link to SiteB`" is associated with both SiteA and SiteB. The ordering number for SiteA is `1`, and the ordering number for SiteB is `2`. SiteA is given priority to the QA probe — `UDP QA probe from Site A over WAN link to SiteB`.

If a QA probe is associated with multiple sites and the ordering is the same for both sites, the weights of the **site rules**[1] are used to resolve the conflict. The weights are inherent to the site rules.

Example 2

The discovered QA probe name "`UDP QA probe from Site A over WAN link to SiteB`" is associated with both SiteA and SiteB. The ordering number for both SiteA and SiteB is `1`.

However, QA probe "`UDP QA probe from Site A over WAN link to SiteB`" matches the Node Group rule for SiteA and the QA Probe Name Pattern rule for SiteB. This QA probe is therefore associated with SiteA because the Node Group rule has a higher priority than the QA Probe Name Pattern rule.

If the inherent site rules also match for the conflicting sites, the NNM iSPI Performance for QA uses the last modified time to prioritize the sites. In this case, the QA probe is associated to the most recently configured site.

c. Node Group:

   Enter the node group that you want to assign to the site.

   You can classify the node groups based on their types, geographic locations etc, while you add them to a site.

   The node group must be discovered by HP Network Node Manager i Software and must be already present in the NNMi database.

d. Select an NNMi tenant from the list of tenants created in NNMi.

   NNMi provides a tenant named Default Tenant and assigns each newly discovered node to the Default Tenant and the Security Group attribute value configured for the Default Tenant. As an NNMi administrator, you can create new tenants and security groups. See *Configure Tenants* and *Configuring Security* in *HP Network Node Manager i Software Online Help: Help for Administrators*.

e. IP Address Range:

[1] Configuration associated to a site are called site rules. For example Node Group, Ordering, Test Name Pattern, etc are the site rules that are used to configure a site. The rules are prioritized inherently. The Node Group rule has the highest priority, the IP Address rule the second highest priority. Test Name Pattern rule has the third highest priority while the VRF Name rule has the the lowest priority among these four rules. Note that none of these rules have any dependency to each other. In other words, while creating a site, you can specify all or any of the the rules.

Type the IP address or IP address range and click Add **Add** to associate an IP address or IP address range to the site. The new IP address is added to the list in the IP Address Range box. You can add IPv4 and IPv6 addresses.

Select an IP address or IP address range and click Delete **Delete** to remove it from the IP Address Range box.

You can click Delete All **Delete All** to remove all the addresses listed in the IP Address Range box.

Follow the rules as discussed below, while defining a IP address range:

- For IPv4 addresses you can use "**-**" (the character hyphen) while defining a range of IPv4 addresses.

  Specify the range in ascending order. The range must be from a lower value to a higher value.

- For IPV4 addresses use the wild card character "*" to specify IP addresses between 0 to 255

- For both IPv4 and IPv6, specify an IP address range using "-" (hyphen).

- For both IPv4 and IPv6, specify the IP address range in ascending order. For example, `16.*.*,17.1-100.*.*`.

- For IPv4, addresses like `0.0.0.0` and `127.0.0.1` are considered as invalid.

- For IPv6 addresses use the **standard IPv6 shorthand notation**.

f. Probe Name Patterns:

   The Probe Name Patterns box lists the QA probes associated with the node group.

   By default NNM iSPI Performance for QA populates the Probe Name Patterns box with the QA probe names associated with the node group assigned to the site.

   You can associate a different QA probe with the site. Type the QA probe name patterns and click Add **Add** to associate a different group of QA probes to the site. The new QA probe name is added to the list in the Probe Name Patterns box.

   You can specify a range of QA probe names using the wildcard character "**?**" (to replace one character) and "*" (to replace multiple characters).

   The QA probe name pattern is split into three parts. Follow the rules as described below, while specifying a QA probe pattern:

   - If the QA probe name pattern includes both source and destination information, use a delimiter to differentiate between the source and destination information.

     The QA probe pattern should be in the following format:

     ```
     <pattern for source of the QA probe>|Delimiter| <pattern for
     destination of the QA probe>
     ```

- The string on the left hand side of the delimiter is considered the source information.
- The string on the right hand side of the delimiter is considered the destination information.

Example 1

QA Probe Name Pattern: `SiteA|over|*SiteB`

If you specify the delimiter between two "|" (vertical bar) characters, NNM iSPI Performance for QA considers the QA probe names that contain the word "over". It also considers the following:

- The source information on the left hand side of the delimiter "`over`" should contain the string "`SiteA`".
- The destination information on the right hand side of the delimiter "`over`" should contain the string "`SiteB`" preceding any number of characters.

If you have two QA probes named "`UDP QA probe From SiteA over Provider WAN to SiteB`" and "`ICMP QA probe From SiteA over Provider WAN to SiteB`", NNM iSPI Performance for QA retrieves both QA probe names.

Example 2

QA Probe Name Pattern: `remote???|to|central*`

This QA probe pattern retrieves QA probe names that match the following criteria:

- The source information on the left hand side of the delimiter "`to`" should contain the string "`remote`", followed by three characters.
- The destination information on the right hand side of the delimiter "to" should contain the string "`central`" followed by any number of characters.

If you have QA probes named "`remoteABC to centralHQ`", and "`remote123 to centralsite`, NNM iSPI Performance for QA retrieves both QA probe names.

- You cannot include blank spaces in QA probe name pattern, but you must enter the wild card "*" (asterisk) wherever required. See the example below:

Example 3

QA Probe Name Pattern: `*|to|test_location`

The wildcard "*" must be entered in the source information if you intend to leave the source information blank, and you want to retrieve the QA probe names of the destination `test_location`. In this example, the NNM iSPI Performance for QAdoes not check for the source information, and it retrieves all the probes with the destination `test_location`. Use this expression if you want to configure a site with all the probes that have `test_location` as the destination.

Note: The above expression also retrieves probes that include the term "to" in the probe source name but not do not have their destination set to `test_location`.

Select a QA probe name and click Delete **Delete** to remove it from the Probe Name Patterns box.

You can click Delete All **Delete All** to select all the QA probes listed in the Probe Name Patterns box and remove them from the Probe Name Patterns box.

g. VRF Wildcards:

If your site is associated with a Virtual Private Network (VPN), NNM iSPI Performance for QA populates the VRF Wildcards box with the available **VRF** ranges. Make sure that the VRF name is associated with the IP address rule that is defined.

You can associate a different VRF range with the site. Type the VRF range and click Add **Add** to associate another VRF range to the site. The new VRF range is added to the list in the VRF Wildcards box.

You can specify a range of VRF using the wildcard character "**?**" (to replace one character) and "*****" (to replace multiple characters).

Select a VRF range and click Delete **Delete** to remove it from the VRF Wildcards box.

You can click Delete All **Delete All** to remove all the VRF ranges listed in the VRF Wildcards box.

4. Use any one of the following options to complete the task:

Icons	Description
Close	Closes the Add Site Configuration form without saving the site information you have entered
Save	Saves the new site information
Save and Close	Saves the site information and closes the Add Site Configuration form

5. Click **Refresh** in the Configured Sites panel to view the changes.

Editing an Existing Site Using the Site Configuration Form

To edit an existing site:

1. Launch the Site Configuration form.

2. Select a site in the **Configured Sites** tab and click **Edit**.

   The Edit Site Configuration form opens.

   From the global manager, you can only view the remote sites, and you cannot edit the remote site details.

3. Update the following values as required:

a. Site Name:

   Enter the name you want to assign to the site.

   Site names are case sensitive. That is `SiteA` and `Sitea` are considered two different sites.

   Site names must be unique. Also, it is recommended to use unique site names across the sites in a GNM environment.

   Site names cannot contain **'** (single quotation marks).

   When you rename a site, it is identified by the new name.

b. Ordering:

   A QA probe can be associated with only one source or destination site. Specify an ordering number for the site in this field to resolve conflicts in case a QA probe matches multiple sites. The NNM iSPI Performance for QA associates the QA probe with the site that has the lowest ordering number.

   If you do not provide an ordering number for the site, the NNM iSPI Performance for QA assigns default ordering. Default ordering for a site is given the lowest priority.

   The QA probe is associated with the site which has the **lowest** ordering in case the QA probe matches multiple sites.

   Example 1

   The discovered QA probe name "`UDP QA probe from Site A over WAN link to SiteB`" is associated with both SiteA and SiteB. The ordering number for SiteA is `1`, and the ordering number for SiteB is `2`. SiteA is given priority to the QA probe — `UDP QA probe from Site A over WAN link to SiteB`.

   If a QA probe is associated with multiple sites and the ordering is the same for both sites, the weights of the **site rules**[1] are used to resolve the conflict. The weights are inherent to the site rules.

   Example 2

   The discovered QA probe name "`UDP QA probe from Site A over WAN link to SiteB`" is associated with both SiteA and SiteB. The ordering number for both SiteA and SiteB is `1`.

   However, QA probe "`UDP QA probe from Site A over WAN link to SiteB`" matches the Node Group rule for SiteA and the QA Probe Name Pattern rule for SiteB. This QA probe is therefore associated with SiteA because the Node Group rule has a higher priority than the QA Probe Name Pattern rule.

[1] Configuration associated to a site are called site rules. For example Node Group, Ordering, Test Name Pattern, etc are the site rules that are used to configure a site. The rules are prioritized inherently. The Node Group rule has the highest priority, the IP Address rule the second highest priority. Test Name Pattern rule has the third highest priority while the VRF Name rule has the the lowest priority among these four rules. Note that none of these rules have any dependency to each other. In other words, while creating a site, you can specify all or any of the the rules.

If the inherent site rules also match for the conflicting sites, the NNM iSPI Performance for QA uses the last modified time to prioritize the sites. In this case, the QA probe is associated to the most recently configured site.

This field displays "Default" if you have not specified a value for this field while creating the site. By default the HP Network Node Manager iSPI Performance for Quality Assurance Software assigns a site the lowest ordering value.

c. Node Group:

   Enter the node group that you want to assign to the site.

   You can classify the node groups based on their types, geographic locations etc, while you add them to a site.

   The node group must be discovered by HP Network Node Manager i Software and must be already present in the NNMi database.

d. Select an NNMi tenant from the list of tenants created in NNMi.

   NNMi provides a tenant named Default Tenant and assigns each newly discovered node to the Default Tenant and the Security Group attribute value configured for the Default Tenant. As an NNMi administrator, you can create new tenants and security groups. See *Configure Tenants* and *Configuring Security* in *HP Network Node Manager i Software Online Help: Help for Administrators*.

e. IP Address Range:

   Type the IP address or IP address range and click Add **Add** to associate an IP address or IP address range to the site. The new IP address is added to the list in the IP Address Range box. You can add IPv4 and IPv6 addresses.

   Select an IP address or IP address range and click Delete **Delete** to remove it from the IP Address Range box.

   You can click Delete All **Delete All** to remove all the addresses listed in the IP Address Range box.

   Follow the rules as discussed below, while defining a IP address range:

   - For IPv4 addresses you can use "**-**" (the character hyphen) while defining a range of IPv4 addresses.

     Specify the range in ascending order. The range must be from a lower value to a higher value.

   - For IPV4 addresses use the wild card character "*" to specify IP addresses between 0 to 255
   - For both IPv4 and IPv6, specify an IP address range using "-" (hyphen).
   - For both IPv4 and IPv6, specify the IP address range in ascending order. For example, `16.*.*`, `17.1-100.*.*`.
   - For IPv4, addresses like `0.0.0.0` and `127.0.0.1` are considered as invalid.
   - For IPv6 addresses use the **standard IPv6 shorthand notation**.

f. Probe Name Patterns:

The Probe Name Patterns box lists the QA probes associated with the node group.

By default NNM iSPI Performance for QA populates the Probe Name Patterns box with the QA probe names associated with the node group assigned to the site.

You can associate a different QA probe with the site. Type the QA probe name patterns and click Add **Add** to associate a different group of QA probes to the site. The new QA probe name is added to the list in the Probe Name Patterns box.

You can specify a range of QA probe names using the wildcard character "**?**" (to replace one character) and "*" (to replace multiple characters).

The QA probe name pattern is split into three parts. Follow the rules as described below, while specifying a QA probe pattern:

- If the QA probe name pattern includes both source and destination information, use a delimiter to differentiate between the source and destination information.

  The QA probe pattern should be in the following format:

  `<pattern for source of the QA probe>|Delimiter| <pattern for destination of the QA probe>`

- The string on the left hand side of the delimiter is considered the source information.
- The string on the right hand side of the delimiter is considered the destination information.

Example 1

QA Probe Name Pattern: `SiteA|over|*SiteB`

If you specify the delimiter between two "|" (vertical bar) characters, NNM iSPI Performance for QA considers the QA probe names that contain the word "over". It also considers the following:

- The source information on the left hand side of the delimiter "`over`" should contain the string "`SiteA`".
- The destination information on the right hand side of the delimiter "`over`" should contain the string "`SiteB`" preceding any number of characters.

If you have two QA probes named "`UDP QA probe From SiteA over Provider WAN to SiteB`" and "`ICMP QA probe From SiteA over Provider WAN to SiteB`", NNM iSPI Performance for QA retrieves both QA probe names.

Example 2

QA Probe Name Pattern: `remote???|to|central*`

This QA probe pattern retrieves QA probe names that match the following criteria:

- The source information on the left hand side of the delimiter "`to`" should contain the string "`remote`", followed by three characters.
- The destination information on the right hand side of the delimiter "to" should contain the string "`central`" followed by any number of characters.

If you have QA probes named "`remoteABC to centralHQ`", and "`remote123 to centralsite`, NNM iSPI Performance for QA retrieves both QA probe names.

- ○ You cannot include blank spaces in QA probe name pattern, but you must enter the wild card "*" (asterisk) wherever required. See the example below:

Example 3

QA Probe Name Pattern: `*|to|test_location`

The wildcard "*" must be entered in the source information if you intend to leave the source information blank, and you want to retrieve the QA probe names of the destination `test_location`. In this example, the NNM iSPI Performance for QAdoes not check for the source information, and it retrieves all the probes with the destination `test_location`. Use this expression if you want to configure a site with all the probes that have `test_location` as the destination.

> **Note:** The above expression also retrieves probes that include the term "to" in the probe source name but not do not have their destination set to `test_location`.

Select a QA probe name and click Delete **Delete** to remove it from the Probe Name Patterns box.

You can click Delete All **Delete All** to select all the QA probes listed in the Probe Name Patterns box and remove them from the Probe Name Patterns box.

g. **VRF Wildcards**

If your site is associated with a Virtual Private Network (VPN), NNM iSPI Performance for QA populates the VRF Wildcards box with the available **VRF** ranges. Make sure that the VRF name is associated with the IP address rule that is defined.

You can associate a different VRF range with the site. Type the VRF range and click Add **Add** to associate another VRF range to the site. The new VRF range is added to the list in the VRF Wildcards box.

You can specify a range of VRF using the wildcard character "**?**" (to replace one character) and "*" (to replace multiple characters).

Select a VRF range and click Delete **Delete** to remove it from the VRF Wildcards box.

You can click Delete All **Delete All** to remove all the VRF ranges listed in the VRF Wildcards box.

4. Use any one of the following options to complete the task:

Icons	Description
Close	Closes the Edit Site Configuration form without saving the site information you have entered
Save	Saves the new site information

Icons	Description
Save and Close	Saves the site information and closes the Edit Site Configuration form
Clear	Clears the site information you have entered in the form

5. Click **Refresh** in the Configured Sites panel to view the changes.

Deleting an Existing Site Using the Site Configuration Form

To delete an existing site:

1. Launch the Site Configuration form.

2. Select a site in the **Configured Sites** panel and click **Delete**.

3. Click **Refresh** in the **Configured Sites** panel to view the changes.

The QA probe associations for the site are deleted automatically once you delete a site. You do not need to recompute the QA probe associations after deleting a site.

In a GNM environment, the global manager cannot delete **Remote Sites**[1] . The sites deleted at the regional manager are propagated to the global manager. In case, the synchronization takes more time, you can run the following commands to trigger synchronization:

To synchronize the deletion of sites at regional manager to the global manager:

```
nmsqasiteconfigutil -synchronize <regional manager name>
```

To synchronize the deletion of sites at all regional managers to the global manager:

```
nmsqasiteconfigutil -synchronize all
```

Deleting All the Existing Sites Using the Site Configuration Form

To delete all the existing sites:

1. Launch the Site Configuration form.

2. Click Delete All **Delete All**.

3. Click **Refresh** in the **Configured Sites** panel to view the changes.

The QA probe associations for the sites are deleted automatically. You do not need to recompute the QA probe associations after deleting the sites.

[1] Sites exported from the regional manager to the global manager are known as Remote Sites.

In a GNM environment, the global manager cannot delete **Remote Sites**[1] . The sites deleted at the regional manager are propagated to the global manager. In case, the synchronization takes more time, you can run the following commands to trigger synchronization:

To synchronize the deletion of sites at regional manager to the global manager:

```
nmsqasiteconfigutil -synchronize <regional manager name>
```

To synchronize the deletion of sites at all regional managers to the global manager:

```
nmsqasiteconfigutil -synchronize all
```

Viewing an Existing Site Configuration Using the Site Configuration Form

To view a site configuration:

1. Launch the Site Configuration form.
2. Select a site in the **Configured Sites** panel and click **Open**.

   The View Site Configuration Details form opens.

   You can view the following details:

Field Name	Description
Site Name	The name of the site
Ordering	The ordering number for the site. This field displays "Default" if you have not specified a value for this field while creating the site
Regional Manager	The name of the Regional Manager where the site was configured
Node Group	The node group assigned to the site
Tenant	The NNMi tenant name associated with the site
IP Address Range	The set of IPv4 or IPv6 addresses associated with the site
Probe Name Pattern	The QA probes or the Probe Name patterns of the QA probes that are associated with the site
VRF Wildcards	The VRF name associated with the site

Exporting a Site

To export the existing site configurations to an XML file:

1. Launch the Site Configuration form.
2. Click Export **Export**.

[1] Sites exported from the regional manager to the global manager are known as Remote Sites.

3. Enter the file name where you want to export the existing site configuration in the user prompt dialog.

   You must enter the file name with full path information; for example, `C:\temp\site_conf.xml`

   If you enter the XML file name without entering the absolute path, by default the file gets saved in the following directory of the NNMi management server where NNM iSPI Performance for QA is installed:

   UNIX: *$NnmDataDir/shared/qa/conf*

   Windows : *%NnmDataDir%\shared\qa\conf*

4. Click **OK** in the user prompt dialog.

You can also export the existing site configuration using the following command line utility:

UNIX: *$NnmInstallDir/bin/nmsqasiteconfigutil.ovpl –u <username> –p <password> –export <filename>*

Windows: *%NnmInstallDir%\bin\nmsqasiteconfigutil.ovpl –u <username> –p <password> –export <filename>*

If the site export fails, check the following log files:

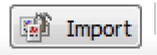
UNIX: *$NnmDataDir/log/qa/qa.log*

Windows: *%NnmDataDir%\log\qa\qa.log*

> **Note:** You can export local sites, but you cannot export remote sites.

Importing Sites

To import site configurations from an XML file:

1. Launch the Site Configuration form.
2. Click 

Import.

   c. In the user prompt dialog, enter the file name from where you want to import the site configuration information.

      You must enter the file name with full path information; for example, `C:\temp\site_conf.xml`

      > **Note:** You can import the sites configured in the previous version of NNM iSPI Performance for QA as well.

4. Click **OK** in the user prompt dialog.

   If a site is already defined and displayed in the Configured Sites panel, the import utility does not import the configuration information for this site from the XML file.

You can also import site configuration information using the following command line utility:

UNIX: *$NnmInstallDir/bin/nmsqasiteconfigutil.ovpl –u <username> –p <password> –import <filename>*

Windows: *%NnmInstallDir%\bin\nmsqasiteconfigutil.ovpl –u <username> –p <password> –import <filename>*

If the site import fails, check the following log files:

UNIX:*$NnmDataDir/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

Re-Computing Probes associated with a Site

HP Network Node Manager iSPI Performance for Quality Assurance Software associates the QA probes with the respective sites during the configuration poll. However, if there are changes in the site configuration, the probes can be associated with the site by clicking on the Recompute Probes Associations button.

User Scenario

The head office of an organization is connected to it's branch office via WAN links. To monitor the network performances of the branch office, a new site is created using the NNM iSPI Performance for QA Site Configuration form. The new site contains the following parameters:

Site Name: `SiteA`

Ordering: `1`

Node Group: `Routers`

IP Address Range: `17.1-100.*.*`

Probe Name Patterns: `*SiteA|to|Central`

VRF Wildcards: None

Later, the following QA probe name patterns need to be added to SiteA:

- SiteA???|to|*Central
- SiteA*|over|Central*

Also, the following VRF groups need to be added:

- VRF 1-SiteA
- VRF 2-SiteA

After the site is reconfigured, the QA probes matching the specified QA probe patterns for the node group "Routers" are associated with SiteA in the next configuration poll.

Use the Recompute Probes Associations utility to associate the QA probes to the new or updated sites at once.

Use any of the following options to recompute QA probe associations for the new or updated sites:

- Click Recompute Probes Associations **Recompute Probes Associations** on the Site Configuration form.
- Use the following command line utility:
  - **UNIX:** *.$NnmInstallDir/bin/bin/nmsqasiteconfigutil.ovpl –u <username> –p <password> –recompute*
  - **Windows:** *%NnmInstallDir%\bin\nmsqasiteconfigutil.ovpl –u <username> –p <password> –recompute*

    By default, the %NnmInstallDir% is *<drive>:\Program Files(x86)\HP\HP BTO Software*

    If the recomputation does not occur due to an internal error, you can run the following command to reset the internal queue and the gateway flag to allow subsequent probe associations:

    ```
    nmsqasiteconfigutil -resetrecomputeQ
    ```

Cloning (Copying) Existing Site Configuration Using the Site Configuration Form

To clone the existing configuration for a selected site:

1. Launch the Site Configuration form.
2. Select the site you want to copy.
2. Click **Clone** in the Configured Sites panel.

   The Edit Site Configuration form opens.
3. You can update values for the following **site rules**[1]:

   a. Site Name:

      Enter the name you want to assign to the site.

      Site names are case sensitive. That is `SiteA` and `Sitea` are considered two different sites.

      Site names must be unique. Also, it is recommended to use unique site names across the sites in a GNM environment.

      Site names cannot contain **'** (single quotation marks).

      When you rename a site, it is identified by the new name.

[1] Configuration associated to a site are called site rules. For example Node Group, Ordering, Test Name Pattern, etc are the site rules that are used to configure a site. The rules are prioritized inherently. The Node Group rule has the highest priority, the IP Address rule the second highest priority. Test Name Pattern rule has the third highest priority while the VRF Name rule has the the lowest priority among these four rules. Note that none of these rules have any dependency to each other. In other words, while creating a site, you can specify all or any of the the rules.

b. Ordering:

A QA probe can be associated with only one source or destination site. Specify an ordering number for the site in this field to resolve conflicts in case a QA probe matches multiple sites. The NNM iSPI Performance for QA associates the QA probe with the site that has the lowest ordering number.

If you do not provide an ordering number for the site, the NNM iSPI Performance for QA assigns default ordering. Default ordering for a site is given the lowest priority.

The QA probe is associated with the site which has the **lowest** ordering in case the QA probe matches multiple sites.

Example 1

The discovered QA probe name "`UDP QA probe from Site A over WAN link to SiteB`" is associated with both SiteA and SiteB. The ordering number for SiteA is `1`, and the ordering number for SiteB is `2`. SiteA is given priority to the QA probe — `UDP QA probe from Site A over WAN link to SiteB`.

If a QA probe is associated with multiple sites and the ordering is the same for both sites, the weights of the **site rules**[1] are used to resolve the conflict. The weights are inherent to the site rules.

Example 2

The discovered QA probe name "`UDP QA probe from Site A over WAN link to SiteB`" is associated with both SiteA and SiteB. The ordering number for both SiteA and SiteB is `1`.

However, QA probe "`UDP QA probe from Site A over WAN link to SiteB`" matches the Node Group rule for SiteA and the QA Probe Name Pattern rule for SiteB. This QA probe is therefore associated with SiteA because the Node Group rule has a higher priority than the QA Probe Name Pattern rule.

If the inherent site rules also match for the conflicting sites, the NNM iSPI Performance for QA uses the last modified time to prioritize the sites. In this case, the QA probe is associated to the most recently configured site.

c. Node Group:

Enter the node group that you want to assign to the site.

You can classify the node groups based on their types, geographic locations etc, while you add them to a site.

[1] Configuration associated to a site are called site rules. For example Node Group, Ordering, Test Name Pattern, etc are the site rules that are used to configure a site. The rules are prioritized inherently. The Node Group rule has the highest priority, the IP Address rule the second highest priority. Test Name Pattern rule has the third highest priority while the VRF Name rule has the the lowest priority among these four rules. Note that none of these rules have any dependency to each other. In other words, while creating a site, you can specify all or any of the the rules.

The node group must be discovered by HP Network Node Manager i Software and must be already present in the NNMi database.

d. Select an NNMi tenant from the list of tenants created in NNMi.

   NNMi provides a tenant named Default Tenant and assigns each newly discovered node to the Default Tenant and the Security Group attribute value configured for the Default Tenant. As an NNMi administrator, you can create new tenants and security groups. See *Configure Tenants* and *Configuring Security* in *HP Network Node Manager i Software Online Help: Help for Administrators*.

e. IP Address Range:

   Type the IP address or IP address range and click Add **Add** to associate an IP address or IP address range to the site. The new IP address is added to the list in the IP Address Range box. You can add IPv4 and IPv6 addresses.

   Select an IP address or IP address range and click Delete **Delete** to remove it from the IP Address Range box.

   You can click Delete All **Delete All** to remove all the addresses listed in the IP Address Range box.

   Follow the rules as discussed below, while defining a IP address range:

   - For IPv4 addresses you can use "**-**" (the character hyphen) while defining a range of IPv4 addresses.

     Specify the range in ascending order. The range must be from a lower value to a higher value.

   - For IPV4 addresses use the wild card character "*" to specify IP addresses between 0 to 255
   - For both IPv4 and IPv6, specify an IP address range using "-" (hyphen).
   - For both IPv4 and IPv6, specify the IP address range in ascending order. For example, `16.*.*,17.1-100.*.*`.
   - For IPv4, addresses like `0.0.0.0` and `127.0.0.1` are considered as invalid.
   - For IPv6 addresses use the **standard IPv6 shorthand notation**.

f. Probe Name Patterns:

   The Probe Name Patterns box lists the QA probes associated with the node group.

   By default NNM iSPI Performance for QA populates the Probe Name Patterns box with the QA probe names associated with the node group assigned to the site.

   You can associate a different QA probe with the site. Type the QA probe name patterns and click Add **Add** to associate a different group of QA probes to the site. The new QA probe name is added to the list in the Probe Name Patterns box.

   You can specify a range of QA probe names using the wildcard character "**?**" (to replace one character) and "*" (to replace multiple characters).

The QA probe name pattern is split into three parts. Follow the rules as described below, while specifying a QA probe pattern:

- If the QA probe name pattern includes both source and destination information, use a delimiter to differentiate between the source and destination information.

  The QA probe pattern should be in the following format:

  `<pattern for source of the QA probe>|Delimiter| <pattern for destination of the QA probe>`

- The string on the left hand side of the delimiter is considered the source information.
- The string on the right hand side of the delimiter is considered the destination information.

Example 1

QA Probe Name Pattern: `SiteA|over|*SiteB`

If you specify the delimiter between two "|" (vertical bar) characters, NNM iSPI Performance for QA considers the QA probe names that contain the word "over". It also considers the following:

- The source information on the left hand side of the delimiter "`over`" should contain the string "`SiteA`".
- The destination information on the right hand side of the delimiter "`over`" should contain the string "`SiteB`" preceding any number of characters.

If you have two QA probes named "`UDP QA probe From SiteA over Provider WAN to SiteB`" and "`ICMP QA probe From SiteA over Provider WAN to SiteB`", NNM iSPI Performance for QA retrieves both QA probe names.

Example 2

QA Probe Name Pattern: `remote???|to|central*`

This QA probe pattern retrieves QA probe names that match the following criteria:

- The source information on the left hand side of the delimiter "`to`" should contain the string "`remote`", followed by three characters.
- The destination information on the right hand side of the delimiter "to" should contain the string "`central`" followed by any number of characters.

If you have QA probes named "`remoteABC to centralHQ`", and "`remote123 to centralsite`, NNM iSPI Performance for QA retrieves both QA probe names.

- You cannot include blank spaces in QA probe name pattern, but you must enter the wild card "*" (asterisk) wherever required. See the example below:

Example 3

QA Probe Name Pattern: `*|to|test_location`

The wildcard "*" must be entered in the source information if you intend to leave the source information blank, and you want to retrieve the QA probe names of the destination `test_location`. In this example, the NNM iSPI Performance for QAdoes not check for the source information, and it retrieves all the probes with the destination `test_location`. Use this expression if you want to configure a site with all the probes that have `test_location` as the destination.

> **Note:** The above expression also retrieves probes that include the term "to" in the probe source name but not do not have their destination set to `test_location`.

Select a QA probe name and click Delete **Delete** to remove it from the Probe Name Patterns box.

You can click Delete All **Delete All** to select all the QA probes listed in the Probe Name Patterns box and remove them from the Probe Name Patterns box.

g. VRF Wildcards:

If your site is associated with a Virtual Private Network (VPN), NNM iSPI Performance for QA populates the VRF Wildcards box with the available **VRF** ranges. Make sure that the VRF name is associated with the IP address rule that is defined.

You can associate a different VRF range with the site. Type the VRF range and click Add **Add** to associate another VRF range to the site. The new VRF range is added to the list in the VRF Wildcards box.

You can specify a range of VRF using the wildcard character "**?**" (to replace one character) and "*" (to replace multiple characters).

Select a VRF range and click Delete **Delete** to remove it from the VRF Wildcards box.

You can click Delete All **Delete All** to remove all the VRF ranges listed in the VRF Wildcards box.

4. Use any one of the following options to complete the task:

Icons	Description
Close	Closes the Edit Site Configuration form without saving the site information you have entered
Save	Saves the new site information
Save and Close	Saves the site information and closes the Edit Site Configuration form

5. Click **Refresh** in the Configured Sites panel to view the changes.

Probe Based Threshold Configuration

You can use the Configure Threshold form to perform the following tasks:

- Configure the threshold values for the metrics of selective QA probes
- Override the threshold values for the metrics of selective QA probes, which may or may not be associated with a site

You can configure thresholds for the following metrics assigned to the QA probes:

- Round Trip Time (RTT)
- Jitter
- Packet Loss (Can be from source to destination, and from destination to source.)
- **Mean Opinion Score (MOS)**

NNM iSPI Performance for QA performs the following actions if a threshold is breached:

- Sets the QA probe status to Major.
- Creates an incident for the violated threshold.
- Sends the threshold violation details to the Network Performance Server for generating reports.
- Retains the threshold state as Nominal, or sets the threshold state to High or Low depending on the count based, and time based threshold configuration.

You cannot configure thresholds for **Remote QA Probes**[1].

You can monitor the network performance and generate an incident based on the count based threshold configuration or time based threshold configuration.

You can only configure either a count based or time based threshold configuration for a combination of a probe, service, and metric.

Threshold Configuration

Count Based Threshold Configuration

You can generate an incident based on the count or number of consecutive times a metric violates the threshold value. You can define this count in the Threshold Configuration form, and you can specify to trigger an incident when the threshold violation exceeds this count.

Time Based Threshold Configuration

Time based threshold configuration enables you to raise an alert when the threshold breached state persists for more than a specific time period. This is derived by specifying X as the duration of time in minutes when the metric is in a threshold breached state within Y number of minutes specified in the sliding window. Based on your choice, you can trigger an incident if required.

Example for Time Based Threshold Configuration

Consider a scenario, where the polling interval is 5 minutes; High duration is 10 minutes; and High Duration Window is 60 minutes. In this scenario, an incident is generated whenever the High Duration exceeds 10 minutes within the 60 minute duration. NNM iSPI Performance for QA uses a sliding window wherein each time the High Duration (10 minutes) is reached, NNM iSPI

[1] Remote QA probes are primarily discovered and polled at the regional manager.

Performance for QA drops the oldest polled value (first 5 minutes) and adds the most recent (between 60 to 65 minutes). This procedure continues and enables you to determine time based threshold violation.

You can make utmost use of the Time based threshold violation by ensuring that the duration specified in the sliding window is greater than or equal to the polling interval.

Baseline Settings Configuration

Baseline Deviation Settings Configuration

Apart from the time based and count based threshold configuration, you can also do a baseline monitoring based on the baseline deviation setting configuration in NNM iSPI Performance for QA. You can do a baseline deviation setting configuration for the selected probe, service, and metric. An incident is generated and the baseline state transitions to Abnormal Range only if it meets all the criteria listed below:

- Exceeds the count or the number of **standard deviation** that is above the average value for the metric, or exceeds the count or the number of **standard deviation** that is below the average value for the metric.This count is specified in the Upper Baseline Limit Deviations or the Lower Baseline Limit Deviations in the baseline deviation settings configuration
- Exceeds the duration for which the upper or lower baseline deviation persists in the specified sliding window duration

Launching the Configure Threshold Form

To launch the Configure threshold form:

1. Log on to NNMi console using your username and password.

   You must have administrator privileges.

2. From the workspace navigation panel, select **Quality Assurance**

   The Quality Assurance tab expands.

3. Select any one of the following inventory views:

   - QA Probes
   - Critical Probes
   - Threshold Exception Probes
   - Baseline Exception Probes

4. Select the QA probes for which you need to configure the threshold value
   You can select a maximum of 10 QA probes at one point of time

5. Click **Actions** → **Quality Assurance** → **Configure Threshold**
   - If you are configuring a new threshold value for the selected QA probes, the Add Threshold Configuration form opens.
   - If a threshold value already exists for the selected QA probes, the Edit Threshold Configuration form opens

- If you selected **Remote QA Probes**[1], a message appears to indicate that you cannot configure thresholds for the remote QA probes. It also shows the list of remote QA probes selected.

Icons Available in the Threshold Configuration Toolbar	Description
Close	Closes the Threshold Configuration form without saving the current configuration
Save and Close	Saves the current configuration and closes the Threshold Configuration form

Icons Available in the Threshold Settings Tab	Description
New	Adds a new threshold for the QA probes
Edit	Edits/Overrides an existing threshold for the QA probes
✗ Delete	Deletes an existing threshold of the QA probes
Refresh	Retrieves the last saved threshold configuration from the database and displays the data
✗ Delete All Delete All	Deletes all the existing thresholds of the QA probes

Icons Available in the Baseline Settings Tab	Description
New	Adds a baseline settings for the QA probes
Edit	Edits/Overrides an existing baseline setting for the QA probes
✗ Delete	Deletes an existing baseline setting of the QA probes
Refresh	Retrieves the last saved baseline settings configuration from the database and displays the data
✗ Delete All Delete All	Deletes all the existing baseline settings of the QA probes

[1] Remote QA probes are primarily discovered and polled at the regional manager.

Adding New Threshold Settings Using the Threshold Configuration Form

To add a new threshold:

1. Make sure that you selected the Source Site, and Service in the Add Threshold Configuration
2. Click **New** in the **Threshold Settings** tab.

   The Add Threshold Settings form opens.
3. Specify the following to configure the threshold settings:

Field Name	Description
Type	Select the type of threshold violation. The valid types are Count Based and Time Based.
Metric	Select the metric for which you are configuring the threshold. The metrics are populated based on the service.

4. After you select the metric to configure the threshold, the list of fields relevant to the selected metric appear. You can specify the following values to configure the new threshold:

Field Name	Description
High Value	Enter the threshold value. This value indicates the maximum value above which the metric will be considered to have violated the Nominal range. For Packet Loss metric, enter the High Value in percentage.
High Value Rearm	Enter the high value rearm for the threshold. For Packet Loss metric, enter the High Value Rearm in percentage. The High Value Rearm is used to indicate the end of the high threshold state and NNM iSPI Performance for QA clears the incident once it reaches below this value. The high value rearm must always be lower than the high value. **Example** For the **Round Trip Time (RTT)** you must generate an incident when the RTT is 150 and clear the incident when the RTT value comes down to 100. Set the following values for the threshold: ▪ High Value: `150` ▪ High Value Rearm: `100` This value enables you to be aware when a network performance problem starts to improve.
Low Value	Enter the low threshold value. This value indicates the maximum value below which the metric will be considered to have violated the Nominal range.
Low Value Rearm	Enter the low value rearm for the threshold. For Packet Loss metric, enter the Low Rearm Value in percentage. The low value rearm is used to indicate the end of the low threshold state and NNM iSPI Performance for QA clears the incident once it reaches above this value. The low value rearm must be greater than the low value. **Example** For the **Mean Opinion Score (MOS)** you must generate an incident when the MOS score is 3 and clear the incident when the score is improved to 4.5. Set the following values for the threshold:

Field Name	Description
	■ Low Value: `3` ■ Low Value Rearm: `4.5` This value enables you to be aware when a network performance problem starts to improve.

The following field appears, if you selected the Type as Count Based:

Field Name	Description
Trigger Count	Specify after how many consecutive threshold violations NNM iSPI Performance for QA must alert the operator by transitioning the threshold state to High or Low accordingly.

The following fields appear if you selected the Type as Time Based:

Field Name	Description
High Duration	Enter the minimum amount of time for which the QA probes must report high metric values. For example if you specify this value to be 20 minutes for Packet Loss Percentage metric, NNM iSPI Performance for QA considers the threshold to be violated if the Packet Loss Percentage is high for 20 minutes. You define the high threshold value in the High Value field. Set the polling interval as less than or equal to the high duration value.
High Duration Window	Define a window for the high duration value. For example, if you specify this value to be 30 minutes for Packet Loss Percentage metric, NNM iSPI Performance for QA considers the threshold to be violated if the Packet Loss Percentage is high for 20 out of 30 minutes. You define the high threshold value in the High Value field and the high duration in the High Duration field. NNM iSPI Performance for QA drops the oldest polled value and adds the most recent value each time the metric value reaches the High Duration Window. This method is called Sliding Window method, where only the newest set of values are considered for the thresholds. While specifying this value follow these guidelines: ■ This value must be greater than 0 (zero).

Field Name	Description
	▪ This value can be same as the High Duration value.

The following fields appear if you selected the Type as Time Based and the metric as MOS:

Low Duration	Enter the minimum amount of time for which the QA probes must report low metric values. For example if you specify this value to be 20 minutes for MOS metric, NNM iSPI Performance for QA considers the threshold to be violated if the MOS is low for 20 minutes. You define the high threshold value in the Low Value field. Set the polling interval as less than or equal to the low duration value.
Low Duration Window	Define a window for the low duration value. For example, if you specify this value to be 30 minutes for MOS metric, NNM iSPI Performance for QA considers the threshold to be violated if the MOS is low for 20 out of 30 minutes. You define the low threshold value in the Low Value field and the low duration in the Low Duration field. NNM iSPI Performance for QA drops the oldest polled value and adds the most recent value each time the metric value reaches the Low Duration Window. This method is called Sliding Window method, where only the newest set of values are considered for the thresholds. While specifying this value follow these guidelines: ▪ This value must be greater than 0 (zero). ▪ This value can be same as the Low Duration value.

5. Select the following to generate an incident when the time based threshold or count based threshold value is violated:

Field Name	Description
Generate Incident	Select this option if you want NNM iSPI Performance for QA to generate an incident for count based or time based threshold violations. By default this option is selected.

6. Use any one of the following options to complete the task:

Icons	Description
Close	Closes the Add Threshold Configuration form without saving the threshold information you have entered.

Icons	Description
Save and Close	Saves the threshold information and closes the Threshold Configuration form

7. Click **Refresh** to view the changes.

8. Click **Save** or **Save and Close** in the Threshold Configuration form.

    > **Caution:** The new threshold is not saved unless you click **Save** or **Save and Close** in the Threshold Configuration form.

NNM iSPI Performance for QA applies the following rules while creating thresholds for a **site** using this form:

- You can create thresholds only for the existing sites.
- You must select a source site and service for the new threshold.
- You could select the destination site for the new threshold
- If you do not specify a destination site for the threshold, the threshold is applied to all the destination sites of the source sites.
- You cannot configure thresholds for remote sites.

For a Time Based Threshold configuration on probes, if the polling interval is greater than the High Duration or Low Duration value, the threshold cannot be configured for those QA probes. A list of these QA Probes, the UUID, and other details can be viewed in the log file, which is available in the following directory:

UNIX:*$NnmDataDir/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

Editing an Existing Threshold Setting Using the Threshold Configuration Form

To edit an existing threshold setting:

1. Specify all the mandatory fields in Edit Threshold Configuration form

    a. Select the metric, and click **Edit** in the **Threshold Settings** tab.

    The Edit Threshold Settings form opens.

    > **Caution:** You cannot edit the metric type and threshold type (Time based or Count based). If you want to edit the metric type or threshold type (Time based or Count

> based), delete the existing configuration settings and configure a new threshold settings, based on your requirements.

2. You can specify the following values to edit the threshold:

   For probe based threshold configuration, you can view the threshold that was configured for the Remote QA probes, but you **cannot** configure thresholds for **Remote QA Probes**[1].

Field Name	Description
High Value	Enter the threshold value. This value indicates the maximum value above which the metric will be considered to have violated the Nominal range. For Packet Loss metric, enter the High Value in percentage.
High Value Rearm	Enter the high value rearm for the threshold. For Packet Loss metric, enter the High Value Rearm in percentage. The High Value Rearm is used to indicate the end of the high threshold state and NNM iSPI Performance for QA clears the incident once it reaches below this value. The high value rearm must always be lower than the high value. **Example** For the **Round Trip Time (RTT)** you must generate an incident when the RTT is 150 and clear the incident when the RTT value comes down to 100. Set the following values for the threshold: ▪ High Value: `150` ▪ High Value Rearm: `100` This value enables you to be aware when a network performance problem starts to improve.
Low Value	Enter the low threshold value. This value indicates the maximum value below which the metric will be considered to have violated the Nominal range.
Low Value Rearm	Enter the low value rearm for the threshold. For Packet Loss metric, enter the Low Rearm Value in percentage. The low value rearm is used to indicate the end of the low threshold state and NNM iSPI Performance for QA clears the incident once it reaches above this value. The low value rearm must be greater than the low value.

[1] Remote QA probes are primarily discovered and polled at the regional manager.

Field Name	Description
	Example For the **Mean Opinion Score (MOS)** you must generate an incident when the MOS score is 3 and clear the incident when the score is improved to 4.5. Set the following values for the threshold: ■ Low Value: `3` ■ Low Value Rearm: `4.5` This value enables you to be aware when a network performance problem starts to improve.

The following fields appear, if the Type is Count Based, and you can modify the information if required

Field Name	Description
Trigger Count	Specify after how many consecutive threshold violations NNM iSPI Performance for QA must alert the operator by transitioning the threshold state to High or Low accordingly.

The following fields appear if the Type is Time Based, and you can modify the information if required:

Field Name	Description
High Duration	Enter the minimum amount of time for which the QA probes must report high metric values. For example if you specify this value to be 20 minutes for Packet Loss Percentage metric, NNM iSPI Performance for QA considers the threshold to be violated if the Packet Loss Percentage is high for 20 minutes. You define the high threshold value in the High Value field. Set the polling interval as less than or equal to the high duration value.
High Duration Window	Define a window for the high duration value. For example, if you specify this value to be 30 minutes for Packet Loss Percentage metric, NNM iSPI Performance for QA considers the threshold to be violated if the Packet Loss Percentage is high for 20 out of 30 minutes. You define the high threshold value in the High Value field and the high duration in the High Duration field.

Field Name	Description
	NNM iSPI Performance for QA drops the oldest polled value and adds the most recent value each time the metric value reaches the High Duration Window. This method is called Sliding Window method, where only the newest set of values are considered for the thresholds. While specifying this value follow these guidelines: ▪ This value must be greater than 0 (zero). ▪ This value can be same as the High Duration value.

The following fields appear, if you selected the Type as Time Based and the metric as MOS:

You can modify the information if required.

Low Duration	Enter the minimum amount of time for which the QA probes must report low metric values. For example if you specify this value to be 20 minutes for MOS metric, NNM iSPI Performance for QA considers the threshold to be violated if the MOS is low for 20 minutes. You define the high threshold value in the Low Value field. Set the polling interval as less than or equal to the low duration value.
Low Duration Window	Define a window for the low duration value. For example, if you specify this value to be 30 minutes for MOS metric, NNM iSPI Performance for QA considers the threshold to be violated if the MOS is low for 20 out of 30 minutes. You define the low threshold value in the Low Value field and the low duration in the Low Duration field. NNM iSPI Performance for QA drops the oldest polled value and adds the most recent value each time the metric value reaches the Low Duration Window. This method is called Sliding Window method, where only the newest set of values are considered for the thresholds. While specifying this value follow these guidelines: ▪ This value must be greater than 0 (zero). ▪ This value can be same as the Low Duration value.

3. Select the following to generate an incident when the time based threshold or count based threshold value is violated:

Field Name	Description
Generate Incident	Select this option if you want NNM iSPI Performance for QA to generate an incident for count based or time based threshold violations. By default this option is selected.

4. Use any one of the following options to complete the task:

Icons	Description
Close	Closes the Add Threshold Configuration form without saving the threshold information you have entered
Save and Close	Saves the threshold information and closes the Threshold Configuration form

5. Click **Refresh** in the Threshold Settings panel to view the changes.

6. Click **Save** or **Save and Close** in the Threshold Configuration form.

   The changes you have made in the threshold will not be saved unless you click **Save** or **Save and Close** in the Threshold Configuration form.
   NNM iSPI Performance for QA applies the following rules while updating thresholds:

   - You can define thresholds only for the existing sites.
   - Any modification in the threshold directly updates the state poller.

For a Time Based Threshold configuration on probes, if the polling interval is greater than the High Duration or Low Duration value, the threshold cannot be configured for those QA probes. A list of these QA Probes, the UUID, and other details can be viewed in the log file, which is available in the following directory:

UNIX:*$NnmDataDir/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

> **Note:** You can select all the threshold configured settings and click **Edit** option, but edit from will open for only one threshold group.

Adding New Baseline Settings Using the Threshold Configuration Form

To add a new baseline setting configuration:

1. Make sure that you selected the Source Site, and Service in the Add Threshold Configuration form .

2. Click **New** in the **Baseline Settings** tab.

The Add Baseline Settings form opens.

3. Specify the following to configure the baseline deviation settings:

   You can expand or collapse the baseline deviation settings.

Field Name	Description
Metric	Select the metric for which you require to configure baseline deviation settings. The valid metrics for baseline deviation setting configuration are as below: ▪ RTT (ms) ▪ RTT (microS) ▪ Two Way Jitter (microS) ▪ Two Way Packet Loss (%) ▪ MOS

4. After you select the metric, the list of fields relevant to the selected metric appear. You can specify the following values to configure the baseline deviation settings:

Field Name	Description
Upper Baseline Limit Enabled	If you enable this option, NNM iSPI Performance for QA uses the Upper Baseline Limit Deviations-Above Average field value to determine the number of times there is a **standard deviation** above the average value. If you disable this option NNM iSPI Performance for QA does not consider the Upper Baseline Limit Deviations-Above Average field value. This field is not relevant and does not appear for MOS metric.
Upper Baseline Limit Deviations - Above Average	The number or count of **standard deviation** above the average values for NNM iSPI Performance for QA to determine the upper baseline limit. This field is not relevant and does not appear for MOS metric.
Lower Baseline Limit Enabled	If you enable this option, NNM iSPI Performance for QA uses the Lower Baseline Limit Deviations-Below Average field value to determine the number of times there is a **standard deviation** below the average value. If you disable this option NNM iSPI Performance for QA does not consider the Lower Baseline Limit Deviations - Below Average field value. This field appears only for MOS metric.

Field Name	Description
Lower Baseline Limit Deviations - Below Average	The number or count of **standard deviation** below the average values for NNM iSPI Performance for QA to determine the lower baseline limit. This field appears only for MOS metric.
Duration	The minimum time for which the standard deviation must persist to deviate from the configured Baseline Range before the baseline state transitions to Abnormal Range and generates an incident. The Polling Interval should be less than or equal to the Duration.
Window Duration	The window duration within which the Upper Baseline Limit or Lower Baseline Limit Deviation criteria must be met. The value must be greater than 0 (zero) and can be the same as the Duration value. NNM iSPI Performance for QA uses a sliding window, meaning that each time the Duration is reached, NNM iSPI Performance for QA drops the oldest polling cycle and adds the most recent.

5. Use any one of the following options to complete the task:

Icons	Description
Close	Closes the Add Baseline Settings form without saving the baseline setting information you have entered.
Save and Close	Saves the baseline setting information and closes the Add Baseline Settings form

6. Click **Save and Close** in the Add Baseline Settings form to save the baseline setting information.

7. Click **Save** or **Save and Close** in the Threshold Configuration form.

The new baseline settings configuration is not saved unless you click **Save** or **Save and Close** in the Threshold Configuration form.

NNM iSPI Performance for QA applies the following rules while configuring baseline deviation settings for a **site** using this form:

- You can configure baseline settings only for the QA probes of the existing sites.
- You must select a source site, service, and metric to configure the baseline settings.
- Optionally, you can select the destination site
- If you do not specify a destination site for the baseline setting, the configuration is applied to all the QA probes of the destination sites from the source sites.
- You cannot configure baseline settings for remote sites.

Editing Baseline Settings Using the Threshold Configuration Form

To edit a baseline setting configuration:

1. Make sure that you selected the Source Site, and Service in the Edit Threshold Configuration form if you are launching the form from Site Wide threshold configuration. You can ignore this step if you are launching this form from Probe based threshold configuration.

2. Select the baseline settings, and click ✎ **Edit** in the **Baseline Settings** panel.

   The Edit Baseline Settings form opens.

3. To edit the baseline deviations settings in the **Baseline Deviations Settings** panel:

   a. You can view the following details:

Field Name	Description
Metric	The metric for which you require to edit the baseline deviations settings configuration.

   b. You can edit the following baseline deviation settings configuration:

   The following fields appear depending on the metric:

Field Name	Description
Upper Baseline Limit Enabled	If you enable this option, NNM iSPI Performance for QA uses the Upper Baseline Limit Deviations-Above Average field value to determine the number of times there is a **standard deviation** above the average value. If you disable this option NNM iSPI Performance for QA does not consider the Upper Baseline Limit Deviations-Above Average field value. This field is not relevant and does not appear for MOS metric.
Upper Baseline Limit Deviations - Above Average	The number or count of **standard deviation** above the average values for NNM iSPI Performance for QA to determine the upper baseline limit. This field is not relevant and does not appear for MOS metric.
Lower Baseline Limit Enabled	If you enable this option, NNM iSPI Performance for QA uses the Lower Baseline Limit Deviations-Below Average field value to determine the number of times there is a **standard deviation** below the average value.

Field Name	Description
	If you disable this option NNM iSPI Performance for QA does not consider the Lower Baseline Limit Deviations - Below Average field value. This field appears only for MOS metric.
Lower Baseline Limit Deviations - Below Average	The number or count of **standard deviation** below the average values for NNM iSPI Performance for QA to determine the lower baseline limit. This field appears only for MOS metric.
Duration	The minimum time for which the standard deviation must persist to deviate from the configured Baseline Range before the baseline state transitions to Abnormal Range and generates an incident. The Polling Interval should be less than or equal to the Duration.
Window Duration	The window duration within which the Upper Baseline Limit or Lower Baseline Limit Deviation criteria must be met. The value must be greater than 0 (zero) and can be the same as the Duration value. NNM iSPI Performance for QA uses a sliding window, meaning that each time the Duration is reached, NNM iSPI Performance for QA drops the oldest polling cycle and adds the most recent.

4. Use any one of the following options to complete the task:

Icons	Description
Close	Closes the Edit Baseline Settings form without saving the baseline setting information you have entered.
Save and Close	Saves the baseline setting information and closes the Edit Baseline Settings form

5. Click **Save and Close** in the Edit Baseline Settings form to save the baseline setting information.

6. Click **Save** or **Save and Close** in the Site Wide Threshold Configuration form.

The new baseline settings configuration is not be saved unless you click **Save** or **Save and Close** in the Threshold Configuration form.

NNM iSPI Performance for QA applies the following rules while configuring baseline deviation settings for a **site** using this form:

- You can configure baseline settings only for the QA probes of the existing sites.
- You must select a source site and service to configure the baseline settings.
- Optionally, you could select the destination site
- If you do not specify a destination site for the baseline setting, the configuration is applied to all the QA probes of the destination sites from the source sites.
- You cannot configure baseline settings for remote sites.

Deleting an Existing Threshold of QA Probes Using the Edit Threshold Configuration Form

To delete an existing threshold of QA probes:

1. Launch the Configure Threshold form.
2. Select a threshold in the **Threshold Settings** panel and click **Delete**.
3. Click **Refresh** in the Threshold Settings panel to view the changes.

The following changes occur after deleting a probe based threshold configuration:

The selected thresholds configured for the metrics of the QA probe are deleted and the threshold state is set to Threshold Not Set for the metric. The QA Probe status is set to the most severe status. If the QA probe is associated with a site, the threshold state configured for the metric in the site is associated with the QA probe. The incidents and conclusions are updated accordingly.

Example 1

Consider the following scenario:

Before Deleting the Threshold(s) Configured for the QA Probe:

QA Probe Status : Major

Threshold State: High

Note: The threshold state is high for RTT and Packet Loss

Conclusion: RttThresholdStateHigh, TwoWayPktLossThresholdStateHigh, RTTAbnormal

After Deleting the Threshold(s) Configured for the QA Probe:

QA Probe Status : Major

Threshold State: Threshold Not Set

Note: The threshold state is set to Threshold Not Set for RTT and Packet Loss. If the QA probe is associated with a site the Threshold State is updated based on the threshold configured for the site.

Conclusion: RTTAbnormal

The QA Probe Status is still set to Major as the Baseline State is in the Abnormal Range.

Example 2

Consider the following scenario:

Before Deleting the Threshold(s) Configured for the QA Probe:

QA Probe Status : Major

Threshold State: High

Conclusion: TestUp[1], RttThresholdStateHigh,TwoWayPktLossThresholdStateHigh

**After
Deleting the Threshold(s) Configured for the QA Probe**:

QA Probe Status : Normal

Threshold State: Threshold Not Set

If the QA probe is associated with a site the Threshold State is updated based on the threshold configured for the site.

Conclusion: TestUp[2]

Deleting All Existing Thresholds of QA Probes Using the Edit Threshold Configuration Form

To delete all the existing thresholds of QA probes:

1. Launch the Configure Threshold form.
2. Click Delete All **Delete All**.
3. Click **Refresh** in the Threshold Settings panel to view the changes.

The following changes occur after deleting a probe based threshold configuration:

The thresholds configured for the QA probes are deleted and the threshold state is set to Threshold Not Set for the QA probe. The QA Probe status is set to the most severe status. If the QA probe is associated with a site, the threshold state of the site is associated with the QA probe. The incidents and conclusions are updated accordingly.

Example 1

Consider the following scenario:

Before Deleting all the Thresholds Configured for the QA Probe

QA Probe Status : Major

Threshold State: High

[1] When both Administrative and Operational states are up.
[2] When both Administrative and Operational states are up.

> **Note:** The threshold state is high for RTT and Packet Loss

Conclusion: RttThresholdStateHigh, TwoWayPktLossThresholdStateHigh, RTTAbnormal

After Deleting all the Thresholds Configured for the QA Probe:

QA Probe Status : Major

Threshold State: Threshold Not Set

> **Note:** The threshold state is set to Threshold Not Set for RTT and Packet Loss. If the QA probe is associated with a site, the Threshold State is updated based on the threshold configured for the site.

Conclusion: RTTAbnormal

The QA Probe Status is still set to Major as the Baseline State is in the Abnormal Range.

Example 2

Consider the following scenario:

Before Deleting all the Thresholds Configured for the QA Probe

QA Probe Status : Major

Threshold State: High

Conclusion: TestUp[1], RttThresholdStateHigh,TwoWayPktLossThresholdStateHigh

After Deleting all the Thresholds Configured for the QA Probe:

QA Probe Status : Normal

Threshold State: Threshold Not Set

If the QA probe is associated with a site the Threshold State is updated based on the threshold configured for the site.

Conclusion: TestUp[2]

Launching the Probe Specific Threshold Form

To launch the probe specific threshold configuration form:

[1] When both Administrative and Operational states are up.

[2] When both Administrative and Operational states are up.

1. Log on to NNMi console using your username and password.

   You must have administrator privileges.

2. From the workspace navigation panel, select **Configuration** workspace.

3. Select **Quality Assurance Configuration Console**.

   The console opens.

4. In the **Configuration** workspace, select **Probe Specific Threshold**.

   The Probe Specific Threshold form opens.

   For more information,see the topic Configure threshold for QA Probes

   You can view the following:

   Probes with Specific Thresholds

Attribute Name	Description
Name	The name of the discovered QA probe configured in the network device
Service	The type of the discovered QA probe Some of the QA probe types that the HP Network Node Manager iSPI Performance for Quality Assurance Software recognizes are as follows: ▪ **UDP Echo** ▪ **ICMP Echo** ▪ **UDP** ▪ **TCP Connect** ▪ **VoIP**
Owner	The name of the discovered QA probe's owner.
Source	The source device from which the probe is configured.
Destination	The destination network device to which the probe is configured.
ToS	Type of Service specified in an IP packet header that indicates the service level required for the packet
Settings	Move the mouse over this icon to view a snapshot of all the threshold settings configured for the probe.

5. You can perform the following tasks using the Probe Specific Threshold Configuration form:

Icons Available in the Probe Specific Threshold Toolbar	Description
Close	Closes the Threshold Configuration form without saving the current configuration

Icons Available in the Probe Specific Threshold Toolbar	**Description**
Icons Available in the Probes With Specific Thresholds Tab	**Description**
✎ Edit Configured Settings	Edits the selected probe based threshold configuration
✗ Delete Configured Settings	Deletes an existing probe based threshold configuration
⟳ Refresh	Retrieves the last saved data from the database and displays the data in the view

NNM iSPI Performance for QA Threshold Incidents

The following table lists the incidents raised for NNM iSPI Performance for QA threshold violations:

Incident Name	Severity	Interpretation
• DestinationToSourceNegativeJitterHigh • SourceToDestinationNegativeJitterHigh	Critical	Measured value for negative jitter is higher than the upper bound of configured threshold value
• DestinationToSourcePositiveJitterHigh • SourceToDestinationPositiveJitterHigh	Critical	Measured value for positive jitter is higher than the upper bound of configured threshold value
TwoWayJitterHigh	Critical	Measured value for two way jitter is higher than the upper bound of configured threshold value
• DestinationToSourcePacketLossHigh • SourceToDestinationPacketLossHigh	Critical	Measured value for packet loss percetage is higher than the upper bound of configured threshold value
TwoWayPacketLossHigh	Critical	Measured value for packet loss percetage is higher than the upper bound of configured threshold value
MeanOpinionScoreLow	Critical	Measured value for Mean Opinion Score (MOS) is less than the lower bound of configured threshold value
RoundTripTimeHigh	Critical	Measured value for round trip time is higher than the upper bound of configured threshold value
TestDisabled	Critical	Selected QA probe is in Disabled state
TestError	Warning	Selected QA probe returned an error

TestFalied	Critical	Selected QA probe failed to run
TestTransient	Critical	Selected QA probe is in transient state

NNM iSPI Performance for QA Baseline Incidents

The following table lists the NNM iSPI Performance for QA baseline incidents:

Incident Name	Severity	Interpretation
• DestinationToSourceNegativeJitterAbnormal • SourceToDestinationNegativeJitterAbnormal	Critical	Measured value for negative jitter is abnormal during the baseline monitoring time
• DestinationToSourcePositiveJitterAbnormal • SourceToDestinationPositiveJitterAbnormal	Critical	Measured value for positive jitter is abnormal during the baseline monitoring time
TwoWayJitterAbnormal	Critical	Measured value for two way jitter is abnormal during the baseline monitoring time
• DestinationToSourcePacketLossAbnormal • SourceToDestinationPacketLossAbnormal	Critical	Measured value for packet loss percentage is abnormal during the baseline monitoring time
TwoWayPacketLossAbnormal	Critical	Measured value for packet loss percentage is abnormal during the baseline monitoring time
MeanOpinionScoreAbnormal	Critical	Measured value for Mean Opinion Score (MOS) is abnormal during the baseline monitoring time
RoundTripTimeAbnormal	Critical	Measured value for round trip time is abnormal during the baseline monitoring time
	Critical	Measured value for negative jitter is abnormal during the baseline monitoring time
	Critical	Measured value for packet loss percentage is abnormal during the baseline monitoring time

NNM iSPI Performance for QA Discovery Filter Configuration

You may have numerous probes configured in your entire network. Not all these QA probes are always useful for you to analyze, monitor, or measure the network performance. So, you can restrict to discover, and monitor only a required set of probes in a network environment.

This feature allows you to exclude the QA probes (like the interface health reporting QA probes) that produce a lot of output, which may not be required for monitoring the network performance.

The Discovery Filter Configuration enables you to filter the discovery process, and excludes the QA probes based on the following attributes of the QA probe:

- Owners associated with the QA probes
- IP addresses of the source or destination device for which the QA probe is configured
- Service types of the QA probe

If you filter the QA probes based on different attributes, the QA probes are excluded or filtered only if it fulfills all the criteria specified in this user interface. For example, if you specify the filters based on Owners, and Service, the discovery filter ensures that it meets both the criteria and excludes only those QA probes.

After you apply the filters, the filtered QA probes are removed from the database. The poller stops polling these QA probes, which get excluded from the QA Probes view.

You cannot apply discovery filters in a Global Network Management environment. The discovery filters applied in the regional manager do not get reflected in the global manager. Similarly, discovery filters applied on the global manager applies only on the data polled by the global manager, and not on the data forwarded by the regional managers.

Launching the Discovery Filter Configuration Form

To launch the discovery filter configuration:

1. Log on to NNMi console using your username and password.

   You must have administrator privileges.

2. Select **Configuration** workspace.
3. Select **Quality Assurance Configuration Console**

   The console opens.

4. In the **Configuration** workspace, select **Probe Discovery Filters**

   The Discovery Filter Configuration form opens.

You can perform the following tasks using the Discovery Filter Configuration form:

Icons Available in the Discovery Filter Configuration Toolbar	Description
Close	Closes the Discovery Filter Configuration form without saving the current configuration
Save	Saves the current configuration
Save and Close	Saves the current configuration and closes the Discovery Filter Configuration form
Refresh	Retrieves the last saved discovery filter configuration from the database
Apply Filter Now Apply Filter Now	Applies the discovery filters and deletes the filtered local QA Probes from the database. This functionality is applicable only for **Local QA Probes**[1] and Discovery filter type.
Export Export	Exports the existing discovery filter configuration
Import Import	Imports discovery filter configuration from an XML file

Icons Available in the Global Settings Panel	Description
Enable Discovery Filters	Enables you to configure filters. If this option is not selected, you will not be able to use the Configured Filters panel.

Icons Available in the Configured Filters Tab	Description
New	Adds a new discovery filter
Edit	Edits an existing discovery filter
Delete	Deletes an existing discovery filter
Refresh	Retrieves the last saved discovery filter configuration from the database and displays the data in the Configured Filters panel.
Delete All Delete All	Deletes all existing discovery filters

[1] Local QA probes are QA probes owned by the local sites.

Adding a New Discovery Filter Using the Discovery Filter Configuration Form

To add a new discovery filter:

1. Launch the Discovery Filter Configuration form.
2. Select the **Enable Discovery Filters** option to activate the discovery filters.
3. Click **New** in the **Configured Filters** panel in the Discovery Filter Configuration form.

   The Add Discovery Filter form opens.
4. Enter the following:

   a. **Name**

      A name to identify the discovery filter. The name must not contain ' (single quotation marks).

   b. **Type**

      Select the type of discovery filter. The valid options are as listed below:

      - Discovery: Select this option to **exclude** the QA probes discovered on the network
      - Regional Data Forwarding: Select this option to **exclude** the QA probes forwarded to the global manager. This filter is configured in the regional manager.
      - Global Receiver: Select this option to **exclude** the QA probes received by the global manager. This option appears only for global manager.

   c. **Owner Names**

      Type the QA probe owner name or a pattern suggesting the owner name to be filtered in the Owner Names box .
      You can specify a range of QA probe owner names using the wildcard character **?** (to replace one character) and ***** (to replace multiple characters).

      Click Add Add. The new QA probe owner name is added to the list in the Owner Names box.

      You can select a QA probe owner name, and click Delete to remove it from the Owner Names box.

      You can click Delete All **Delete All** to select all the QA probe owner names listed in the Owner Names box and remove them.

   d. **Source IP Addresses**

      Type the Source IP address or IP address range to be filtered and click Add **Add**.
      You can add IPv4 and IPv6 addresses. If the Source IP Address is not configured, you can enter the Management IP Address.
      Select a Source IP address or IP address range and click

Delete **Delete** to remove it from the Source IP Addresses box.

You can click Delete All **Delete All** to remove all the IP addresses listed in the Source IP Addresses box.

Follow the rules as discussed below, while defining a IP address range:

- For IPv4 addresses you can use "**-**" (the character hyphen) while defining a range of IPv4 addresses.
- Specify the range in ascending order. The range must be from a lower value to a higher value.
- For IPV4 addresses use the wild card character "*" to specify IP addresses between 0 to 255
- For both IPv4 and IPv6, specify an IP address range using "-" (hyphen).
- For both IPv4 and IPv6, specify the IP address range in ascending order. For example, `16.*.*,17.1-100.*.*`.
- For IPv4, addresses like `0.0.0.0` and `127.0.0.1` are considered as invalid.
- For IPv6 addresses use the **standard IPv6 shorthand notation**.

e. **Destination IP Addresses**

Type the Destination IP address or IP address range to be filtered and click Add **Add**. You can add IPv4 and IPv6 addresses.

Select an IP address or IP address range and click Delete **Delete** to remove it from the Destination IP Addresses box.

You can click Delete All **Delete All** to remove all the addresses listed in the Destination IP Addresses box.

Follow the rules as discussed below, while defining a IP address range:

- For IPv4 addresses you can use "**-**" (the character hyphen) while defining a range of IPv4 addresses.
- Specify the range in ascending order. The range must be from a lower value to a higher value.
- For IPV4 addresses use the wild card character "*" to specify IP addresses between 0 to 255
- For both IPv4 and IPv6, specify an IP address range using "-" (hyphen).
- For both IPv4 and IPv6, specify the IP address range in ascending order. For example, `16.*.*,17.1-100.*.*`.
- For IPv4, addresses like `0.0.0.0` and `127.0.0.1` are considered as invalid.
- For IPv6 addresses use the **standard IPv6 shorthand notation**.

f. **Service**

Select any one or more of the following services to be filtered and click Add **Add**

- **UDP Echo**
- **ICMP Echo**
- **UDP**
- **TCP Connect**
- **VoIP**

The service is added to the list in the Service box.

Select the service, and click Delete **Delete** to remove it from the Service box. You can click Delete All **Delete All** to remove all the service listed in the box.

The QA probes are excluded or filtered only if it fulfills all the criteria specified in this user interface. For example, if you specify the filters based on Owners, and Service, the discovery filter ensures that it meets both the criteria and excludes only those QA probes.

5. Use any of the following options to complete the task:

Icons	Description
Close	Closes the Discovery Filter Configuration form without saving the filter information you have entered.
Save	Saves the new discovery filter information
Save and Close	Saves the discovery filter information and closes the Discovery Filter Configuration form

Editing a Discovery Filter Using the Discovery Filter Configuration Form

To edit a discovery filter:

1. Launch the Discovery Filter Configuration form .
2. Select a filter in the in the **Configured Filters** tab in the Discovery Filter Configuration Form, and click **Edit**.

   The Edit Discovery Filter form opens.
3. Select **Enable Discovery Filters** option to activate the discovery filters.
4. Update the following values as required:

   You cannot edit the discovery filters configured for the regional managers from the global manager.

   a. **Name**

      A unique name to identify the discovery filter. The name must not contain ' (single quotation marks).

b. **Type**

Select the type of discovery filter. The valid options are listed below:

- Discovery: Select this option to **exclude** the QA probes discovered on the network
- Regional Data Forwarding: Select this option to **exclude** the QA probes forwarded to the global manager
- Global Receiver: Select this option to **exclude** the QA probes received by the global manager. This option appears only for global manager.

The following fields appear only if you select the type of discovery filter.

c. **Owner Names**

Type the QA probe owner name or a pattern suggesting the owner name to be filtered in the Owner Names box .

You can specify a range of QA probe owner names using the wildcard character **?** (to replace one character) and * (to replace multiple characters).

Click Add **Add**. The new QA probe owner name is added to the list in the Owner Names box.

You can select a QA probe owner name, and click Delete to remove it from the Owner Names box.

You can click Delete All **Delete All** to select all the QA probe owner names listed in the Owner Names box and remove them.

d. **Source IP Addresses**

Type the Source IP address or IP address range to be filtered and click Add **Add**. You can add IPv4 and IPv6 addresses. If the Source IP Address is not configured, you can enter the Management IP Address.

Select a Source IP address or IP address range and click Delete **Delete** to remove it from the Source IP Addresses box.

You can click Delete All **Delete All** to remove all the addresses listed in the Source IP Addresses box.

Follow the rules as discussed below, while defining a Source IP address range:

- For IPv4 addresses you can use "**-**" (the character hyphen) while defining a range of IPv4 addresses.
- Specify the range in ascending order. The range must be from a lower value to a higher value.
- For IPV4 addresses use the wild card character "*" to specify IP addresses between 0 to 255
- For both IPv4 and IPv6, specify an IP address range using "-" (hyphen).

- For both IPv4 and IPv6, specify the IP address range in ascending order. For example, `16.*.*,17.1-100.*.*`.
- For IPv4, addresses like `0.0.0.0` and `127.0.0.1` are considered as invalid.
- For IPv6 addresses use the **standard IPv6 shorthand notation**

e. **Destination IP Addresses**

Type the Destination IP address or IP address range to be filtered and click Add **Add**. You can add IPv4 and IPv6 addresses. Select a Destination IP address or IP address range and click Delete **Delete** to remove it from the Destination IP Addresses box.

You can click Delete All **Delete All** to remove all the addresses listed in the Destination IP Addresses box.

Follow the rules as discussed below, while defining a IP address range:

- For IPv4 addresses you can use "**-**" (the character hyphen) while defining a range of IPv4 addresses.
- Specify the range in ascending order. The range must be from a lower value to a higher value.
- For IPV4 addresses use the wild card character "*" to specify IP addresses between 0 to 255
- For both IPv4 and IPv6, specify an IP address range using "-" (hyphen).
- For both IPv4 and IPv6, specify the IP address range in ascending order. For example, `16.*.*,17.1-100.*.*`.
- For IPv4, addresses like `0.0.0.0` and `127.0.0.1` are considered as invalid.
- For IPv6 addresses use the **standard IPv6 shorthand notation**

f. **Service**

Select any one or more of the following services to be filtered from the drop-down list, and click Add **Add**

- **UDP Echo**
- **ICMP Echo**
- **UDP**
- **TCP Connect**
- **VoIP**

The service is added to the list in the Service box.

Select the service, and click Delete **Delete** to remove it from the Service box.

You can click Delete All Delete All to remove all the services listed in the box.

The QA probes are excluded or filtered only if it fulfills all the criteria specified in this user interface. For example, if you specify the filters based on Owners, and Service, the discovery filter ensures that it meets both the criteria and excludes only those QA probes.

5. Use any one of the following options to complete the task:

Icons	Description
Close	Closes the Discovery Filter Configuration form without saving the filter information you have entered
Save	Saves the new discovery filter information
Save and Close	Saves the discovery filter information and closes the Discovery Filter Configuration form

Deleting an Existing Discovery Filter Using the Discovery Filter Configuration Form

To delete an existing discovery filter:

1. Launch the Discovery Filter Configuration form.
2. Select a filter in the **Configured Filters** panel in the Discovery Filter Configuration Form, and click **Delete**.
3. Click **Refresh** in the **Configured Filters** panel to view the changes.

After you delete a discovery filter, the filtered probes are discovered in the next discovery cycle.

Deleting All Existing Discovery Filters Using the Discovery Filter Configuration Form

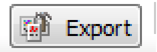
To delete all the existing discovery filters:

1. Launch the Discovery Filter Configuration form.
2. Click Delete All **Delete All**.
3. Click **Refresh** in the **Configured Filters** panel to view the changes.

After you delete all discovery filters, the filtered probes are discovered in the next discovery cycle.

Exporting a Discovery Filter

To export the existing discovery filter configurations to an XML file:

1. Launch the Discovery Filter Configuration form.
2. Click  **Export**.
3. Enter the file name where you want to export the existing discovery filter configuration in the user prompt dialog.

   You must enter the file name with full path information; for example, `C:\temp\disco_filter_conf.xml`

   If you enter the XML file name without entering the absolute path, by default the file gets saved in the following directory:

   UNIX: *$NnmDataDir/shared/qa/conf*

   Windows: *%NnmDataDir%\shared\qa\conf*
4. Click **OK** in the user prompt dialog.

You can also export the existing discovery filter using the following command line utility:

UNIX: *$NnmInstallDir/bin/nmsqadiscofilter.ovpl –u <username> –p <password> –export <filename>*

Windows: *%NnmInstallDir%\bin\nmsqadiscofilter.ovpl –u <username> –p <password> –export <filename>*

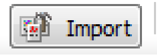
If the discovery filter export fails, check the following log files:

UNIX:*$NnmDataDir/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

Importing Discovery Filters

To import discovery filter configurations from an XML file:

1. Launch the Discovery Filter Configuration form.
2. Click  **Import**.
3. In the user prompt dialog, enter the file name from where you want to import the discovery filter configuration information.

   You must enter the file name with full path information; for example, `C:\temp\disco_filter_conf.xml`
4. Click **OK** in the user prompt dialog.

If a discovery filter is already defined and displayed in the Discovery Filter Configuration form, the import utility does not import the configuration information for this discovery filter from the XML file.

You can also import discovery filter using the following command line utility:

UNIX: *$NnmInstallDir/bin/nmsqadiscofilter.ovpl –u <username> –p <password> –import <filename>*

Windows: *%NnmInstallDir%\bin\nmsqadiscofilter.ovpl –u <username> –p <password> –import <filename>*

If the discovery filter import fails, check the following log files:

UNIX:.*$NnmDataDir/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

> **Note:** While you import a discovery filter from the previous version of NNM iSPI Performance for QA, the discovery filter name is automatically generated in this version of NNM iSPI Performance for QA.

HP Network Node Manager iSPI Performance for Quality Assurance Software Global Network Management Configuration

The Global Network Management (GNM) configuration of the NNM iSPI Performance for QA provides distributed deployment capabilities in a network environment. An implementation of NNM iSPI Performance for QA in a GNM environment is very similar to an implementation of NNMi in a GNM environment. For more information on the GNM feature, see the *Connecting Multiple NNMi management servers* topic in the *HP Network Node Manager i Software Online help*

Before you implement the GNM configuration for the NNM iSPI Performance for QA, you must have implemented the GNM configuration for NNMi. The global manager and regional managers configured in NNMi **must be the same** in NNM iSPI Performance for QA. For example, a regional manager (RM) in NNMi cannot be a global manager (GM) in NNM iSPI Performance for QA.

It is not mandatory to configure the NNM iSPI Performance for QA in a GNM environment if NNMi is configured in the GNM environment. In such instances, the NNM iSPI Performance for QA can be installed on the NNMi GM, and the GM discovers the nodes that are hosting the QA probes as local nodes.

You must make sure that in a GNM environment all the NNMi management servers have time synchronization.

For more information on the GNM scenarios in NNM iSPI Performance for QA, see the chapter *Deploying NNM iSPI Performance for QA in a Global Network Management Environment* in the *NNM iSPI Performance for Quality Assurance Software Deployment Reference* guide.

Launching the Global Network Management Configuration Form

Perform the following steps to launch the Global Network Management configuration form:

1. Log on to the global manager NNMi console using your username and password.

   You must have administrator privileges.

2. From the workspace navigation panel, select **Configuration** workspace.
3. Select **Quality Assurance Configuration Console**

   The console opens.

4. In the **Configuration** workspace, select **Global Network Management**

   The Global Network Management configuration form opens.

You can perform the following tasks using the Global Network Management Configuration form:

Icons Available in the Global Network Management Configuration Toolbar	Description
New	Creates a new regional Manager
Open	Opens the Modify Regional Manager Configuration form of the selected Regional Manager
Delete	Deletes the selected regional manager
Refresh	Refreshes and displays the last saved regional manager configurations
Close	Closes the GNM form without saving the current configuration

You can view the following details if you have configured a regional manager

Field Name	Description
Name	The connection name for the regional NNMi management server.
Description	A description for the regional manager connection.
UUID	The Universally Unique Identifier of the regional manager.
Connection State	The Connection status can be either one of the following: • Not Established • Connected

Creating a New Regional Manager

To create a new regional manager:

1. Launch the Global Network Management Configuration form.
2. Click **New** in the Global Network Management Configuration form.

   The Regional Manager Configuration form opens.
3. Enter values for the following:

Field Name	Description
Name	Type the connection name for the regional NNMi management server. Make sure that the regional manager connection name is the same as the connection name specified for the NNMi
Description	This field is optional. Type a description for the regional manager.

4. Select any one of the following options:

Option	Description
Close	Closes the Create New Regional Manager Configuration form without saving the information you entered.
Save	Saves the regional manager configuration.

5. You can perform the following tasks when you click on the **Connections** tab.:

Icons Available in Connections Tab	Description
New	Adds a new regional manager connection
Open	Opens the Modify Regional Manager Connections form of the selected regional manager connection
Delete	Deletes the details of the selected regional manager connection
Refresh	Refreshes and displays the last saved regional manager connection

Adding a Regional Manager Connection

1. Launch the Global Network Management Configuration form
2. Make sure that you enter the Name in the Create Regional Manager form.
3. Click **New** in the **Connections** panel of the Create New Regional Manager Configuration form.

   The Add Regional Manager Connection form opens.
4. Enter values for the following:
   a. **Hostname**

      The Fully Qualified Domain Name (FQDN) of the NNMi management server which should be connected as the regional manager.

   b. **Use Encryption**

      If you select this option, NNM iSPI Performance for QA uses the Hypertext Transfer Protocol Secure (HTTPS) to connect to the regional NNMi management server.

      If you do not select this option NNM iSPI Performance for QA uses the Hypertext Transfer Protocol (HTTP) to connect to the regional NNMi management server.

      If you selected HTTPS option in NNMi management server, you must select the Use Encryption option. However, if you selected the HTTP option in NNMi management server, you must clear the Use Encryption option.

   c. **HTTP(S) Port**

      If you selected the Use Encryption (previous field), you must enter the port number for the HTTPS protocol.

      If you did not select the Use Encryption (previous field), you must enter the port number for the HTTP protocol.

   d. **User Name**

      Type a valid user name of the regional NNMi management server.

   e. **User Password**

      Type the password of the User Name for the regional NNMi management server.

   f. **Ordering**

      A numeric value. NNM iSPI Performance for QA checks for configuration settings in the order you define (lowest number first). NNM iSPI Performance for QA uses the first match found for each address. Provide a unique connection ordering number for each regional manager configuration.

      Any duplicate Ordering numbers are checked in random order; for example that group of regional manager connections can be checked in any order during each discovery cycle.
5. Use any one of the following options:

Icons	Description
Close	Closes the Add Regional Manager Connection form without saving the information you have entered
Save	Saves the regional manager connection information
Clear	Clears the regional manager connection information you have entered in the form

Modifying a Regional Manager Connection

1. Launch the Global Network Management Configuration form
2. Select the regional manager connection to be modified.
3. Click **Open**.

   The Modify Regional Manager Connection Configuration form opens.
4. Modify values for the following:
   a. **Hostname**

      The Fully Qualified Domain Name (FQDN) of the NNMi management server which should be connected as the regional manager.

   b. **Use Encryption**

      If you select this option, NNM iSPI Performance for QA uses the Hypertext Transfer Protocol Secure (HTTPS) to connect to the regional NNMi management server.

      If you do not select this option NNM iSPI Performance for QA uses the Hypertext Transfer Protocol (HTTP) to connect to the regional NNMi management server.

      If you selected HTTPS option in NNMi management server, you must select the Use Encryption option. However, if you selected the HTTP option in NNMi management server, you must clear the Use Encryption option.

   c. **HTTP(S) Port**

      If you selected the Use Encryption (previous field), you must enter the port number for the HTTPS protocol.

      If you did not select the Use Encryption (previous field), you must enter the port number for the HTTP protocol.

   d. **User Name**

      Type a valid user name of the regional NNMi management server.

   e. **User Password**

      Type the password of the User Name for the regional NNMi management server.

   f. **Ordering**

      A numeric value. NNM iSPI Performance for QA checks for configuration settings in the order you define (lowest number first). NNM iSPI Performance for QA uses the first match found for each address. Provide a unique connection ordering number for each regional manager configuration.

      Any duplicate Ordering numbers are checked in random order; for example that group of regional manager connections can be checked in any order during each discovery cycle.
5. Use any one of the following options:

Icons	Description
Close	Closes the Add Regional Manager Connection form without saving the information you have entered
Save	Saves the regional manager connection information
Clear	Clears the regional manager connection information you have entered in the form

Editing an Existing Regional Manager

You can modify an existing regional manager and regional manager connections as well.

Editing an Existing Regional Manager by using the Modify Regional Manager Configuration Form

To modify a regional manager:

1. Launch the Global Network Management Configuration form.
2. Select the regional manager to be modified in Global Network Management Configuration form.
3. Click **Open** in the Global Network Management Configuration form.

   The Modify Regional Manager Configuration form opens.
4. You can modify the following information:

Field Name	Description
Name	Type the connection name for the regional NNMi management server. Make sure that the regional manager connection name is the same as the connection name specified for the NNMi.
Description	This field is optional. Type a description for the regional manager connection.

5. Select any one of the following options:

Option	Description
Close	Closes the Add Regional Manager Connection form without saving the information you have entered.
Save	Saves the regional manager connection information.

6. Click on the **Connections** tab.
7. Do any one of the following tasks:

Icons Available in the Connections Panel	Description
New	Adds a new regional manager connection
Open	Opens the Modify Regional Manager Connections form of the selected regional manager connection
Delete	Deletes the details of the selected regional manager connection
Refresh	Refreshes the Regional Manager Connections panel and displays the last saved regional manager connection

Editing an Existing Regional Manager Connection Using the Modify Regional Manager Connection Form

To modify a regional manager connection:

1. Launch the Global Network Management Configuration form.
2. Select the regional manager to be modified in the Global Network Management Configuration form.
3. Click **Open** in the Global Network Management Configuration form.

   The Modify Regional Manager Configuration form opens.
4. Select the regional manager connection that needs to be modified in the Connections panel.
5. Click **Open** in the Connections panel.

   The Modify Regional Manager Connection form opens.

6. You can modify the following information:

Field Name	Description
Use Encryption	If you select this option, NNM iSPI Performance for QA uses the Hypertext Transfer Protocol Secure (HTTPS) to connect to the regional NNMi management server. If you do not select this option, NNM iSPI Performance for QA uses the Hypertext Transfer Protocol (HTTP) to connect to the regional NNMi management server. If you selected HTTPS option in NNMi management server, you must select the Use Encryption option. However, if you selected the HTTP option in NNMi management server, you must clear the Use Encryption option.
HTTP(S) Port	If you selected the Use Encryption (previous field), you must enter the port number of the HTTPS protocol. If you did not select the Use Encryption (previous field), you must enter the port number of the HTTP protocol.
User Name	Type a valid user name of the regional NNMi management server.
User Password	Type the password of the User Name for the regional NNMi management server.
Ordering	A numeric value. NNM iSPI Performance for QA checks for configuration settings in the order you define (lowest number first). NNM iSPI Performance for QAuses the first match found for each address. Provide a unique connection ordering number for each regional manager configuration. Any duplicate Ordering numbers are checked in random order; for example that group of regional manager connections can be checked in any order during each discovery cycle.

7. Select any one of the following options:

Icons	Description
Close	Closes the Modify Regional Manager Connection form without saving the information you have entered
Save	Saves the regional manager connection information
Clear	Clears the regional manager connection information you have entered in the form

Deleting an Existing Regional Manager

Deleting an Existing Regional Manager Configuration Using Global Network Management Configuration Form

To delete a regional manager configuration:

If you delete a regional manager configuration, all the objects such as sites associated with the regional manager gets deleted.

1. Launch the Global Network Management Configuration form.
2. Select the regional manager in the Global Network Management Configuration form, and click ✖ **Delete** .
3. Click 🔄 **Refresh** in the Global Network Management Configuration form to view the changes.

Deleting an Existing Regional Manager Connection Using Modify Regional Manager Configuration Form

To delete a regional manager connection:

If you delete a regional manager configuration, all the objects such as sites associated with the regional manager gets deleted.

1. Launch the Global Network Management Configuration form.
2. Select the regional manager to be deleted in the Global Network Management Configuration form.
3. Click **Open** in the Global Network Management Configuration form.

   The Modify Regional Manager Configuration form opens.
4. Select the regional manager connection in the Connections panel, and click ✖ **Delete**
5. Click 🔄 **Refresh** in the Connections panel to view the changes.

QA Groups

On a large enterprise network, you may have a large number of NNM iSPI Performance for QA elements. Without a grouping and filtering mechanism, managing and monitoring these elements may become time consuming and cumbersome. NNM iSPI Performance for QA enables you to group NNM iSPI Performance for QA elements based on a common feature. You can use the QA groups for the following tasks:

- Create discovery filters:[1]
- Configure QA probe thresholds:[2]
- View the QA probes based on the QA groups:[3]

One NNM iSPI Performance for QA element can be part of multiple QA Groups.

You can group the NNM iSPI Performance for QA elements based on the following parameters.

Grouping parameters for QA Probe Elements:

- Probe name
- Probe owner name
- Probe type
- Probe ToS
- Source host
- Destination host
- Target address
- VRF name
- Source site
- Destination site
- Node group name

Grouping parameters for CBQoS Elements:

- Policy name (NNM iSPI Performance for QA includes the parent policy in the group if this policy is a child policy)
- Node on which the policy is hosted
- Node group on which the policy is hosted
- Tenant name
- Interface on which the policy is hosted
- Interface group on which the policy is hosted
- The following interface parameters. Policies hosted on any interface with these attribute are included in the group.

[1] You can create discovery filters based on QA groups. When a QA group is used as a discovery filter, HP Network Node Manager i Software discovers only those probes that match the group definition.

[2] You can configure QA probe thresholds based on the QA groups. When a you configure a threshold for a QA group, NNM iSPI Performance for QA applies the threshold to all the QA probes that belong to the QA group.

[3] You can view the state of the QA probes using the QA Groups inventory view.

  - ifName
  - ifType
  - ifAlias
  - ifDescr
- Policy direction
- Traffic class name
- Action Type

Launching the QA Groups configuration form

To launch the Configure a QA Group form:

1. Log on to NNMi console using your username and password.

   You must have administrator privileges.

2. From the workspace navigation panel, select **Configuration**
3. Click **Quality Assurance Configuration Console**.
4. Select **QA Groups (QA Probes / CBQoS)**from the Configuration workspace

Icons available in the QA Groups configuration toolbar	Description
Close	Closes the QA Groups configuration form without saving the current configuration.
Refresh	Retrieves the last saved configuration from the database and displays the data
Apply Now Apply now	Applies the configured QA Groups
Export Export	Exports the existing configured QA Groups
Import Import	Imports the existing configured QA Groups

Icons available in the configured QA Groups tab	Description
Add	Adds a new QA Group
Edit	Edits / Overrides an existing configured QA Group
Delete	Deletes an existing configured QA Group

Icons available in the configured QA Groups tab	Description
Refresh	Retrieves the last saved configuration from the database and displays the data
Delete All Delete all	Deletes all the existing configured QA Groups
Select all	Selects all the existing QA Groups

Adding a new QA Group

To add a new QA Group:

1. Launch the QA Groups configuration form.
2. Click **New** in the **Configured QA Groups** tab. The Add QA Group form opens.
3. Specify the following to configure the QA Group settings:

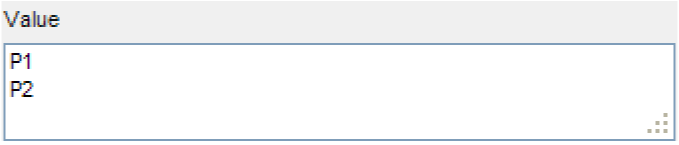
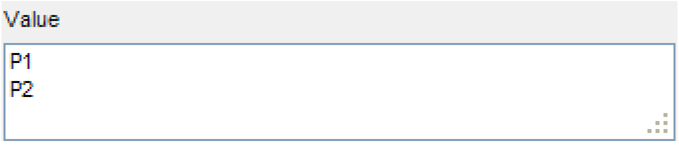
Field name	Description
Name	The name of the QA Group. The name should be unique.
Description	A small description for the QA Group. For example, you can mention "Probes for VoIP", if you are doing a grouping mechanism for all VoIP probes
Type	The type of the QA Group. The valid QA Group types are QA Probes and CBQoS. Select a type for the new QA group before you continue creating the QA group filters.

After you specify the QA Group Type, specify the Filter Editor attributes. The attributes listed for the Filter Editor differ based on the QA Group type (QA Probes or CBQoS).

Filter Editor Attributes

Field Name	Description
Attribute	If you select QA Probes for the QA Group type, the Attribute displays the following parameters: QA Probes • VRF name • Probe ToS • Probe type • Destination site

Field Name	Description
	• Source host • Probe name • Probe owner name • Source site • Node group name • Destination host • Target address If you select CBQoS for the QA Group type, the Attribute displays the following parameters: CBQoS • Interface Description (ifDescr) • Interface Type (ifType) • Interface Alias (ifAlias) • Policy direction • Traffic class name • Policy hosted on interface group • Policy name • Policy hosted on node • Action type • Policy hosted on node group • Interface name (ifName)
Operator	The Standard Query Language (SQL) operations to be used for the search. The valid operators are: • **=** Finds all values equal to the value specified. For example: `Node Group = Cisco` finds all the node groups in the name "**Cisco**" • **!=** Finds all values not equal to the value specified. For example: `Node Group != Cisco` finds all the node groups other than **Cisco**. • **<** Finds all values less than the value specified. For example: `Target address < 197.172.215.215` finds all the IP addresses less than **197.172.215.215** • **<=**Finds all values less than or equal to the value specified. For example: `Target address <= 197.172.215.215` finds all the IP addresses less or equal to **197.172.215.215**

Field Name	Description
	• **>** Finds all values greater than the value specified. For example: `Target address > 197.172.215.215` finds all the IP addresses greater than **197.172.215.215** • **>=** Finds all values greater than or equal to the value specified. For example: `Target address >= 197.172.215.215` finds all the IP address greater than or equal to **197.172.215.215** • **Like**Finds matches using wildcard characters. For example: `Interface Description (ifDescr) like F/a 01` finds all interface names that begin with **F/a 01** • **Not like** Finds all that do not have the values specified (using wildcard strings). For example: `Interface Description (ifDescr) not like F/a 01` finds all interface names that do not begin with **F/a 01**. • **In** Finds any match to at least one value in a list of values. For example: `Policy name in`  Value P1 P2 finds all policy names that are **P1** or **P2**. As shown in the example, you must enter each value on a separate line. • **Not in** Finds all values except those included in the list of values. For example: `Policy name not in`  Value P1 P2 finds all policy names other than **P1** and **P2**. As shown in the example, you must enter each value on a separate line. • **Between** Finds all values equal to and between the two values specified. For example: `Target address between 197.172.1.1 197.172.1.300` finds all IP addresses equal to or greater than **197.172.1.1** and equal to or less than **197.172.1.300** • **Not between** Finds all values except those between the two values specified. For example: `Target address not between 197.172.1.1 197.172.1.300` finds all IP addresses less than **197.172.1.1** and greater than **197.172.1.300**
Value	The value for which you want NNM iSPI Performance for QAto search.

Filter Editor Buttons

Buttons	Description
APPEND	Appends the current expression (Attribute, Operator,and Value) to the selected expression already included in the Filter Editor.
INSERT	Inserts the current expression (Attribute, Operator,and Value) in front of the cursor location within the Filter Editor.
REPLACE	Replaces the selected expression with the expression displayed in the Attribute, Operator, and Value fields.
AND	Inserts the AND Boolean Operator.
OR	Inserts the OR Boolean Operator.
DELETE	Deletes the selected expression.

To specify the Filter Editor:

1. Plan out the logic that you need to do a QA Group.
2. Use the Filter Editor buttons to establish the logic structure, for QA Probes and CBQoS QA Groups.
3. Click **Save** or Save and Close **Save and Close** in the Add QA Groups form.

After you configure the QA Group, you can view the configured QA group details in the QA Groups panel.

4. Select the configured QA Group, and click Apply Now **Apply Now** in the QA Groups panel.

The configured QA Group gets discovered in the inventory view, by clicking the Apply Now **Apply Now** option in the QA Groups panel, or during the next discovery cycle of the nodes.

Editing the existing QA Groups

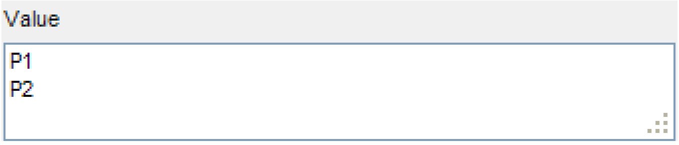
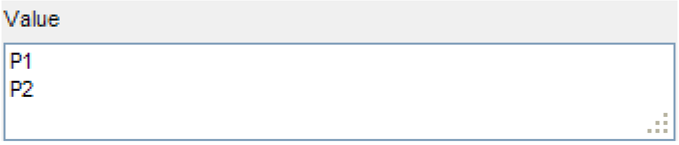
To edit the existing QA Groups:

1. Launch the QA Groups configuration form.
2. Select a configured QA Group to modify, and Click **Edit** in the **Configured QA Groups** tab. The Edit QA Group form opens.
3. Specify the following to configure the QA Group settings:

Field name	Description
Name	The name of the QA Group. The name should be unique.
Description	A small description for the QA Group. For example, you can mention "Probes for VoIP", if you are doing a grouping mechanism for all VoIP probes
Type	The type of the QA Group. The valid QA Group types are QA Probes and CBQoS

4. After you specify the QA Group type, specify the Filter Editor. The Filter Editor differs based on the QA Group type (QA Probes or CBQoS).**Filter Editor Attributes**

Field Name	Description
Attribute	If you select QA Probes for the QA Group type, the Attribute displays the following parameters: QA Probes ▪ VRF name ▪ Probe ToS ▪ Probe type ▪ Destination site ▪ Source host ▪ Probe name ▪ probe owner name ▪ Source site ▪ Node group name ▪ Destination host ▪ Target address If you select CBQoS for the QA Group type, the Attribute displays the following parameters: CBQoS ▪ Interface Description (ifDescr) ▪ Interface Type (ifType) ▪ Interface Alias (ifAlias) ▪ Policy direction ▪ Traffic class name ▪ Policy hosted on interface group ▪ Policy name ▪ Policy hosted on node ▪ Action type ▪ Policy hosted on node group ▪ Interface name (ifName) ▪ Tenant

Field Name	Description
Operator	The Standard Query Language (SQL) operations to be used for the search. The valid operators are: - **=** Finds all values equal to the value specified. For example: `Node Group = Cisco` finds all the node groups in the name "**Cisco**" - **!=** Finds all values not equal to the value specified. For example: `Node Group != Cisco` finds all the node groups other than **Cisco**. - **<** Finds all values less than the value specified. For example: `Target address < 197.172.215.215` finds all the IP addresses less than **197.172.215.215** - **<=**Finds all values less than or equal to the value specified. For example: `Target address <= 197.172.215.215` finds all the IP addresses less or equal to **197.172.215.215** - **>** Finds all values greater than the value specified. For example: `Target address > 197.172.215.215` finds all the IP addresses greater than **197.172.215.215** - **>=** Finds all values greater than or equal to the value specified. For example: `Target address >= 197.172.215.215` finds all the IP address greater than or equal to **197.172.215.215** - **Like**Finds matches using wildcard characters. For example: `Interface Description (ifDescr) like F/a 01` finds all interface names that begin with **F/a 01** - **Not like** Finds all that do not have the values specified (using wildcard strings). For example: `Interface Description (ifDescr) not like F/a 01` finds all interface names that do not begin with **F/a 01**. - **In** Finds any match to at least one value in a list of values. For example: `Policy name in`  Value P1 P2 finds all policy names that are **P1** or **P2**. As shown in the example, you must enter each value on a separate line. - **Not in** Finds all values except those included in the list of values. For example: `Policy name not in`  Value P1 P2

Field Name	Description
	finds all policy names other than **P1** and **P2**. As shown in the example, you must enter each value on a separate line. ▪ **Between** Finds all values equal to and between the two values specified. For example: `Target address between 197.172.1.1 197.172.1.300` finds all IP addresses equal to or greater than **197.172.1.1** and equal to or less than **197.172.1.300** ▪ **Not between** Finds all values except those between the two values specified. For example: `Target address not between 197.172.1.1 197.172.1.300` finds all IP addresses less than **197.172.1.1** and greater than **197.172.1.300**
Value	The value for which you want NNM iSPI Performance for QAto search.

You can use the Filter Editor buttons to edit the existing filters.

Buttons	Description
APPEND	Appends the current expression (Attribute, Operator,and Value) to the selected expression already included in the Filter Editor.
INSERT	Inserts the current expression (Attribute, Operator,and Value) in front of the cursor location within the Filter Editor.
REPLACE	Replaces the selected expression with the expression displayed in the Attribute, Operator, and Value fields.
AND	Inserts the AND Boolean Operator.
OR	Inserts the OR Boolean Operator.
DELETE	Deletes the selected expression.

5. Click **Save** or **Save and close**

Make sure you click the **Save** or Save and Close **Save and Close** in the Edit QA Groups form, after you edit.

6. Click Refresh in the QA Groups panel.

7. Click Apply Now **Apply Now**.

Deleting an Existing QA Group

To delete an existing QA Group:

1. Launch the QA Groups configuration form.
2. Select the QA Group that you want to delete, and click ✖ **Delete** in the **Configured QA Groups** tab.
3. Click 🔄 Refresh in the Configured QA Groups tab to view the changes.

Alternatively, you can use the following command to delete the selected QA groups:

UNIX: *$NnmInstallDir/bin/ nmsqacustomgrouputil.ovpl -u <username> -p <password> -delete -g <QA group name>*

Windows:*%NnmInstallDir%\bin\nmsqacustomgrouputil.ovpl -u <username> -p <password> -delete -g <QA group name>*

If you delete a QA Group, the QA Group information gets deleted from the QA Groups Inventory View. However, deleting a QA group does not delete the QA probes associated with the group.

Deleting all Existing QA Groups

To delete all existing QA Groups:

1. Launch the QA Groups Configuration form.
2. Click ✖ Delete All **Delete All** in the **Configured QA Groups** tab.
3. Click 🔄 **Refresh** in the Configured QA Groups tab to view the changes.

If you delete the QA Groups, the QA Group information gets deleted from the QA Groups Inventory View. However, deleting a QA group does not delete the QA probes associated with the group.

Exporting the QA Group Configurations

To export the QA probes associated with a QA group to an XML file:

1. Launch the QA Group Configuration form.
2. Click Export **Export**.
3. In the user prompt dialog, enter the file name where you want to export the configurations for the existing QA groups.

   You must enter the file name with full path information; for example, `C:\temp\QAGroup_conf.xml`
4. Click **OK** in the user prompt dialog.

You can also export QA group configurations using the following command line utilities:

QA Group Type	QA Group Command	Command Behavior

QA Probes	*nmsqacustomgrouputil.ovpl -u <username> -p <password> -export <filename to export the QA group configurations>*	Exports the QA group configurations to the specified XML file. Provide absolute path for the file where you want to export the QA group configurations.
CBQoS	*nmsqacustomgrouputil.ovpl -u <username> -p <password> -export <filename to export the QA group configurations>*	

If the QA group export fails, check the following log files:

UNIX:*$NnmDataDir/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

Note: You can export QA group configurations for local and remote QA groups.

Importing the QA Group Configurations

To import QA group configurations from an XML file:

1. Launch the QA Group Configuration form.
2. Click Import **Import**.
3. In the user prompt dialog, enter the file name from where you want to import the QA group configuration information.

   You must enter the file name with full path information; for example, `C:\temp\QAGroup_conf.xml`
4. Click **OK** in the user prompt dialog.

   If a QA group is already defined and displayed in the Configured QA group panel, the import utility does not import the configuration information for this site from the XML file.

You can also import QA group configuration information using the following command line utility:

UNIX: *$NnmInstallDir/bin/nmsqacustomgrouputil.ovpl -u <username> -p <password> -import <filename to import the QA group configurations>*

Windows: *%NnmInstallDir%\bin\nmsqacustomgrouputil.ovpl -u <username> -p <password> -import – <filename to import the QA group configurations>*

If the QA group import fails, check the following log files:

UNIX:*$NnmDataDir/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

Configuring Ping Latency Pairs

The NNM iSPI Performance for QA enables you to configure **ping latency pair**[1]s to monitor RTT between pairs of routers and nodes. You must define router-node pairs that you want to monitor in a configuration file. The configuration file—`PingPair.conf`—must be placed in the following location on the NNMi management server:

- Windows: `%NnmDataDir%\shared\qa\conf`
- UNIX/Linux: `/var/opt/OV/shared/qa/conf`

The NNM iSPI Performance for QA installer places a sample copy of the `PingPair.conf` file on the NNMi management server; you can use the sample file as a template.

Contents of the PingPair.conf File

You can define as many router-node pairs as you like in the `PingPair.conf` file. Each line in the file can contain definition of only one pair. Therefore, to define a new router-node pair, introduce a new line first.

Syntax

```
Hostname,ifName,ifIndex,ifAlias
|DestinationName,ifName,ifAlias,ifIndex,DestinationIP|Hostname,IP
```

- The segment before the first pipe (|) character represents the details of the source router.
- The segment before the second pipe (|) character represents the details of the destination node.
- The last segment represents the details of the source proxy.

In other words, you must use the following format while defining a router-node pair:

`Source Details|Destination Details|SourceProxy Details`

Tip: The `SourceProxy Details` segment is an optional segment. You can use this segment if you want to use a proxy router to trigger the ping request on behalf of the source router. In a Multiprotocol Label Switching (MPLS) environment, you can specify the details of the shadow router in this segment. When you omit the `SourceProxy Details` segment, the expression must contain a trailing | character, that is, `Source Details|Destination Details|`.

While specifying these entities in each segment, you must maintain the given order. Not all entities in each segment are mandatory. Each segment includes only one mandatory entity. For each optional entity you omit in a segment, you must add an additional comma before you type the next entity or the | character. For example, if you want to omit `ifIndex` and `ifAlias` in the `Source`

[1] A router-node pair used by the NNM iSPI Peformance for QA to measure and monitor the connectivity between the router and the node. The router-node pair definition must be available in a configuration file provided by the NNM iSPI Peformance for QA.

`Details` segment and `ifName`,`ifAlias`, and `ifIndex` in the `Destination Details` segment, the definition should look like this:

`Hostname,ifName,,|DestinationName,,,,DestinationIP|`

Segments of a Pair Definition

The following sections list segments of a router-node pair definition:

Source Details

The Source Details segment includes the following entities:

Entity	Description
Hostname	*This is a mandatory entity.* The fully qualified domain name of the source router. The router must be an NNMi-managed node. You must specify the same FQDN that appears in the NNMi console.
IfName	The name of the interface that triggers the ping request.
IfIndex	A unique number for identifying the above interface
IfAlias	Use this Interface MIB variable as an additional filter to identify the interfaces to include when creating the subnet connections. This attribute is useful if you have an alias naming convention that is used to identify a set of interfaces. For example, `Connection to remote store in Hawaii.` Maximum 255 characters. The following wildcard characters are allowed: asterisk (*) represents any string, and question mark (?) represents a single character.

Destination Details

The Destination Details segment includes the following entities:

Details	Description
Host name	The name that is assigned to any device within a network, for identification
IfName	The name of the interface
IfIndex	A unique number for identifying an interface. Example: 12345
IfAlias	Use this Interface MIB variable as an additional filter to identify the interfaces to include when creating the subnet connections. This attribute is useful if you have an alias naming convention that is used to identify a set of interfaces. For example, `Connection to remote store in Hawaii.` Maximum 255 characters. The following wildcard characters are allowed:

Details	Description
	asterisk (*) represents any string, and question mark (?) represents a single character.
Dest_IPAddress	*This is a mandatory entity.* The IP address of the destination. You must specify the destination IP address for the ping pair destination information

SourceProxy Details

The SourceProxy segment includes the following entities:

Details	Description
Hostname	The fully qualified domain name of the router that triggers the ping request on behalf of the source router. If you want to use a source proxy, make sure that the proxy router is managed by NNMi and the `Write` community string is configured on the router.
Proxy_IP	The IP address of the proxy router.

Configure Ping Pairs in the PingPair.conf File

To configure ping latency pairs, you must have an administrator's or root access to the NNMi management server where you installed the NNM iSPI Performance for QA.

To configure router-node pairs:

1. Identify the routers in your environment from which you want to trigger ping requests. If you do not have adequate rights on a router, you can use a proxy router for the purpose of triggering the ping request. The source routers (and proxy routers) must be managed by NNMi and the `Write` community string must be enabled on source routers.
2. Identify the nodes to which you want to send the ping requests.
3. Log on to the NNMi management server as administrator or root.
4. Go to the following directory:

   Windows: `%NnmDataDir%\shared\qa\conf`

   UNIX/Linux: `/var/opt/OV/shared/qa/conf`
5. Open the `PingPair.conf` file with a text editor.
6. Add router-node pair definitions. Each line in the file can contain only one definition. Introduce a new line before adding a new pair definition. While typing the definitions, follow the guidelines provided in "Contents of the PingPair.conf File" (on page 287).

   Tip: The `PingPair.conf` file provides a template for adding pair definitions.
7. Save the file.

During the subsequent polling cycle of the NNM iSPI Performance for QA, all routers defined in the `PingPair.conf` file start triggering ping requests. Routers continue to trigger ping requests at the frequency defined in the `PingPairPolling.cfg` file (seeTable: Default Attributes of Each Ping Request).

If the `PingPair.conf` file is deleted from the NNMi management server, you can do one of the following:

- Add a backed-up copy of the old the `PingPair.conf` file in the appropriate directory (see step 4).
- Recreate the `PingPair.conf` file:
  a. Add an empty text file in the directory where the file was present (see step 4).
  b. Save the text file as `PingPair.conf`.
  c. Add router-node pair definitions with the help of the information in "Contents of the PingPair.conf File" (on page 287).

In both cases, you must run the following command for the change to take effect:

- Windows: **%nnminstalldir%\bin\nmsqapingpairconfig.ovpl -u** <*admin_user*> **-p** <*admin_password*> **-resyncConfig**
- UNIX/Linux: **/opt/OV/bin/nmsqapingpairconfig.ovpl -u** <*admin_user*> **-p** <*admin_password*> **-resyncConfig**

In this instance<*admin_user*> is an NNMi administrator and <*admin_password*> is the password of the NNMi administrator.

Configure Default Ping Attributes

The size and frequency of ping requests are defined in the `PingPairPolling.cfg` file by different properties. The NNM iSPI Performance for QA installer places the file on the NNMi management server. Table: Default Attributes of Each Ping Request lists the default attribute values. To change the default attribute values, you must edit the `PingPairPolling.cfg` file.

Default Attributes of Each Ping Request

Attribute	Default Value
Packet count of each ping request	5
Size of each packet	100 bytes
Packet time-out	2000 milliseconds
Polling interval (the interval between two consecutive ping requests)	300 seconds

To configure the default ping attributes:

1. Log on to the NNMi management server as administrator or root.
2. Go to the following directory:

   Windows: `%NnmDataDir%\shared\qa\conf`

UNIX/Linux: `/var/opt/OV/shared/qa/conf`

3. Open the `PingPairPolling.cfg` file with a text editor.
4. Specify values of your choice for the following properties:

Property	Description
PacketCount	Packet count of each ping request
PacketSize	Size of each packet (in bytes)
PollingInterval	Polling interval (the interval between two consecutive ping requests; in seconds)
PacketTimeOut	Packet time-out (in milliseconds)

5. Save the file.
6. For the configuration to take effect, restart the NNM iSPI Performance for QA processes:
   a. **ovstop -c qajboss**
   b. **ovstart -c qajboss**

NNM iSPI Performance for QA Class Based Quality of Service (CBQoS)

NNM iSPI Performance for QA enables you to monitor **Class Based Quality of Service** (CBQoS) managed network elements available in your NNMi environment. Using NNM iSPI Performance for QA, you can monitor the health and performances of CBQoS managed interfaces, policies and classes.

As the NNM iSPI Performance for QA administrator, you can perform the following tasks to monitor the CBQoS interfaces:

- Create thresholds to track the health and performance of the CBQoS interfaces and nodes in your network.
- Create discovery filters to monitor only a required set of CBQoS elements enforced in a network environment.

NNM iSPI Performance for QA supports only Cisco CBQoS interfaces and nodes. NNM iSPI Performance for QA uses the CISCO-CLASS-BASED-QOS-MIB to collect the CBQoS performance data.

Launching the CBQoS Threshold Configuration Form

You can configure thresholds for CBQoS managed network elements and QA Group (CBQoS Probes), using the NNM iSPI Performance for QAfor CBQoS Threshold configuration.

To launch the CBQoS threshold configuration form:

1. Log on to NNMi console using your username and password.

   You must have administrator privileges.
2. From the workspace navigation panel, select **Configuration**.

3. Click **Quality Assurance Configuration Console**.

4. Select **CBQoS Threshold** from the Configuration workspace.

Icons Available in the CBQoS Threshold Configuration Toolbar	Description
Close	Closes the Threshold Configuration form without saving the current configuration
Refresh	Retrieves the last saved configurations from the database and displays the data
Export Export	Exports the existing threshold - CBQoS - QA Group
Import Import	Imports the existing threshold - CBQoS - QA Group
Apply Threshold Now Apply Threshold Now	Applies the threshold for all configured QA Groups

Icons available in the CBQoS Threshold Configuration Toolbar	Description
Add	Adds new threshold settings - CBQoS - QA Group
Edit	Edits an existing threshold settings - CBQoS - QA Group
Delete	Deletes an existing threshold settings - CBQoS - QA Group
Refresh	Retrieves the last saved configuration settings from the database and displays the data
Delete All Delete all	Deletes all existing threshold settings - CBQoS - QA Group

NNM iSPI Performance for QA CBQoS Threshold Configuration

NNM iSPI Performance for QA CBQoS thresholds enables you to track the health and performance of the CBQoS interfaces and nodes in your network.

You can configure the thresholds based on the following CBQoS element types:

- CBQoS Class
- CBQoS Node Group
- CBQoS Parent Policy[1]
- Independent CBQoS Policy (a policy that does not refer to any other policies)

You can establish thresholds for the probes associated with the CBQoS elements. You can configure these thresholds to create an incident whenever the network performance measurement assigned to the site breaches a threshold.

NNM iSPI Performance for QA performs the following actions if a threshold is breached:

- Sets the CBQoS element status to Major.
- Creates an incident for the violated threshold.
- Retains the threshold state as Nominal, or sets the threshold state to High or Low depending on the count based, or time based threshold configuration.

The global manager receives the threshold states from the sites in the regional managers. The thresholds configured for the CBQoS elements of the global managers are not applicable for the sites of regional managers.

You can monitor the network performance and generate an incident based on the count based threshold or time based threshold configuration. However, you can only configure either a count based or time based threshold configuration for a combination of a CBQoS element and metric.

Threshold Configurations

Count Based Threshold Configuration

You can generate an incident based on the count or number of consecutive times a metric violates the threshold value. You can define this count in the Threshold Configuration form, and you can specify to trigger an incident when the threshold violation exceeds this count.

Time Based Threshold Configuration

Time based threshold configuration enables you to raise an alert when the threshold breached state persists for more than a specific time period. This is derived by specifying X as the duration of time

[1] A parent policy contains references to other policies, that are known as child policies. You can define thresholds only on the parent policies. However, NNM iSPI Performance for QA applies the parent policy threshold on the classes configured for the child policies too.

in minutes when the metric is in a threshold breached state within Y number of minutes specified in the sliding window. Based on your choice, you can trigger an incident if required.

Example for Time Based Threshold Configuration

Consider a scenario, where the polling interval is 5 minutes; High duration is 10 minutes; and High Duration Window is 60 minutes. In this scenario, an incident is generated whenever the High Duration exceeds 10 minutes within the 60 minute duration. NNM iSPI Performance for QA uses a sliding window wherein each time the High Duration (10 minutes) is reached, NNM iSPI Performance for QA drops the oldest polled value (first 5 minutes) and adds the most recent (between 60 to 65 minutes). This procedure continues and enables you to determine time based threshold violation.

You can make utmost use of the Time based threshold violation by ensuring that the duration specified in the sliding window is greater than or equal to the polling interval.

Adding New CBQoS Threshold Using the Add Threshold Configuration Form

To add a new CBQoS threshold:

1. Launch the CBQoS Threshold configuration form.

   The Add CBQoS Threshold Configuration form opens.

2. In the Configured CBQoS Thresholds panel of the CBQoS Threshold Configuration form, click **New**.

3. Specify the following to configure the threshold:

Field Name	Description
Name	Specify the name you want to assign to the threshold. Threshold names are case sensitive. That is `ThresholdA` and `thresholdA` are considered two different thresholds. Threshold names must be unique. Also, it is recommended to use unique threshold names across the CBQoS elements in a GNM environment. Use only alphanumeric characters to define threshold names. Threshold names cannot contain special characters.
Ordering	Specify a numeric value. NNM iSPI Performance for QA checks for configuration settings in the order you define (lowest number first). NNM iSPI Performance for QA uses the first match found for each threshold. Provide a unique ordering number for each threshold. Thresholds with duplicate Ordering numbers are checked in random order. If a CBQoS interface or node applies to multiple criteria,

Field Name	Description
	NNM iSPI Performance for QA computes the breached threshold and generates an incident based on the ordering number; lower numbers are given higher priority. For example, you configured threshold T1 based on the class called DefaultClass and T2 based on the node group Routers. The ordering number for T1 is 1 and T2 is 2. CBQoS interface Fa0/0 belongs to node group Routers and has DefaultClass configured on it. NNM iSPI Performance for QA considers threshold T1 to compute threshold violation and incident generation.
Threshold Type	In the Threshold Type, select **CBQoS Condition Based**
Policy	Specify a CBQoS policy name on which you want to configure the threshold and click Add to add the policy in the list. The CBQoS elements on which the selected policy is applied come under the threshold.
Class	Specify a CBQoS class name on which you want to configure the threshold and click Add to add the class in the list. The CBQoS elements on which the selected class is applied come under the threshold.
Node Group	Specify a CBQoS node group on which you want to configure the threshold and click Add to add the node group in the list. You must create a CBQoS node group in NNMi before configuring a CBQoS thershold on the node group.

You must specify at least one criterion for the threshold. That is, specify at least one policy, class, or node group for the threshold.

NNM iSPI Performance for QA enables you to use wildcard characters to define the policy, class, and node group criteria.

4. On the Threshold Settings tab, click **New** to configure the metrics for the threshold. For more information, see Adding New CBQoS Threshold Settings Using Add Threshold Settings Form.

Adding New CBQoS Threshold Settings Using Add Threshold Settings Form

To configure the metrics for the threshold:

1.

Specify the following to configure the threshold settings:

Field Name	Description
Type	Select the type of threshold violation. The valid types are Count Based and Time Based.
Metric	Select the metric for which you are configuring the threshold. The metrics are populated based on the service.

After you select the metric to configure the threshold, the list of fields relevant to the selected metric appear. You can specify the following values to configure the new threshold:

Field Name	Description
High Value	Enter the threshold value. This value indicates the maximum value above which the metric will be considered to have violated the Nominal range. For Packet Loss metric, enter the High Value in percentage.
High Value Rearm	Enter the high value rearm for the threshold. For Packet Loss metric, enter the High Value Rearm in percentage. The High Value Rearm is used to indicate the end of the high threshold state and NNM iSPI Performance for QA clears the incident once it reaches below this value. The high value rearm must always be lower than the high value. **Example** For the Discarded Packets percentage, you must generate an incident when the percentage is 90 and clear the incident when the percentage comes down to 60. Set the following values for the threshold: ▪ High Value: `90` ▪ High Value Rearm: `60` This value enables you to be aware when a network performance problem starts to improve.

The following field appears, if you selected the Type as Count Based:

Field Name	Description
Trigger Count	Specify after how many consecutive threshold violations NNM iSPI Performance for QA must alert the operator by transitioning the threshold state to High.

The following fields appear if you selected the Type as Time Based:

Field Name	Description
High Duration	Enter the minimum amount of time for which the QA probes must report high metric values. For example if you specify this value to be 20 minutes for Packet Loss Percentage metric, NNM iSPI Performance for QA considers the threshold to be violated if the Packet Loss Percentage is high for 20 minutes. You define the high threshold value in the High Value field. Set the polling interval as less than or equal to the high duration value.
High Duration Window	Define a window for the high duration value. For example, if you specify this value to be 30 minutes for Packet Loss Percentage metric, NNM iSPI Performance for QA considers the threshold to be violated if the Packet Loss Percentage is high for 20 out of 30 minutes. You define the high threshold value in the High Value field and the high duration in the High Duration field. NNM iSPI Performance for QA drops the oldest polled value and adds the most recent value each time the metric value reaches the High Duration Window. This method is called Sliding Window method, where only the newest set of values are considered for the thresholds. While specifying this value follow these guidelines: ▪ This value must be greater than 0 (zero). ▪ This value can be same as the High Duration value.

Select the following to generate an incident when the time based threshold or count based threshold value is violated:

Field Name	Description
Generate Incident	Select this option if you want NNM iSPI Performance for QA to generate an incident for count based or time based threshold violations. By default this option is selected.

2. Use any one of the following options to complete the task:

Icons	Description
Close	Closes the Add Threshold Settings form without saving the threshold information you have entered.
Save and	Saves the threshold information and closes the Threshold Settings form

Icons	Description
Close	

3. Continue creating the threshold in the Add CBQoS Threshold Configuration form.

Step 3: Saving the Threshold Using the Add Threshold Configuration Form

Use any one of the following options to complete creating the threshold:

Icons	Description
Close	Closes the Add Threshold Configuration form without saving the threshold information you have entered.
Save and Close	Saves the threshold information and closes the Threshold Configuration form

To view the changes, in the CBQoS Threshold Configuration form, click **Refresh**

Check the following log file if you see an error:

UNIX:*$NnmDataDir/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

Editing CBQoS Threshold Settings Using the Edit Threshold Configuration Form

To edit an existing CBQoS threshold:

1. Launch the CBQoS Threshold Configuration form.
2. Select the threshold setting to modify, and click **Edit**.

The Edit CBQoS Threshold Configuration form opens.

3.

You can edit the following settings:

Field Name	Description
Ordering	Specify a numeric value. NNM iSPI Performance for QA checks for configuration settings in the order you define (lowest number first). NNM iSPI Performance for QA uses the first match found for each threshold. Provide a unique ordering number for each threshold. Thresholds with duplicate Ordering numbers are checked in random order.
Policy	Specify a CBQoS policy name on which you want to

Field Name	Description
	configure the threshold and click Add to add the policy in the list. The CBQoS elements on which the selected policy is applied come under the threshold.
Class	Specify a CBQoS class name on which you want to configure the threshold and click Add to add the class in the list. The CBQoS elements on which the selected class is applied come under the threshold.
Node Group	Specify a CBQoS node group on which you want to configure the threshold and click Add to add the node group in the list.

Make sure that you have specified at least one criterion for the threshold. That is, specify at least one policy, class, or node group for the threshold

If you create a new threshold configuration or modify the threshold configuration criteria (policy, class, or node group), NNM iSPI Performance for QA applies the changes in the next configuration polling cycle. However, NNM iSPI Performance for QA does not delete the incidents that are already generated for an existing threshold.

Editing Existing CBQoS Threshold Settings Using Edit Threshold Settings Form

To configure the metrics for the threshold:

1. Make sure that you have specified the mandatory fields in the Edit Threshold Configuration.
2. Select the threshold settings, and Click **Edit**
3.

   Specify the following to configure the threshold settings:

Field Name	Description
Type	Select the type of threshold violation. The valid types are Count Based and Time Based.
Metric	Select the metric for which you are configuring the threshold. The metrics are populated based on the service.

After you select the metric to configure the threshold, the list of fields relevant to the selected metric appear. You can specify the following values to configure the new threshold:

Field Name	Description
High Value	Enter the threshold value. This value indicates the maximum value above which the metric will be considered to have violated the Nominal range. For Packet Loss metric, enter the High Value in percentage.
High Value Rearm	Enter the high value rearm for the threshold. For Packet Loss metric, enter the High Value Rearm in percentage. The High Value Rearm is used to indicate the end of the high threshold state and NNM iSPI Performance for QA clears the incident once it reaches below this value. The high value rearm must always be lower than the high value. **Example** For the Discarded Packets percentage, you must generate an incident when the percentage is 90 and clear the incident when the percentage comes down to 60. Set the following values for the threshold: ▪ High Value: `90` ▪ High Value Rearm: `60` This value enables you to be aware when a network performance problem starts to improve.

The following field appears, if you selected the Type as Count Based:

Field Name	Description
Trigger Count	Specify after how many consecutive threshold violations NNM iSPI Performance for QA must alert the operator by transitioning the threshold state to High.

The following fields appear if you selected the Type as Time Based:

Field Name	Description
High Duration	Enter the minimum amount of time for which the QA probes must report high metric values. For example if you specify this value to be 20 minutes for Packet Loss Percentage metric, NNM iSPI Performance for QA considers the threshold to be violated if the Packet Loss Percentage is high for 20 minutes. You define the high threshold value in the High Value field.

Field Name	Description
	Set the polling interval as less than or equal to the high duration value.
High Duration Window	Define a window for the high duration value. For example, if you specify this value to be 30 minutes for Packet Loss Percentage metric, NNM iSPI Performance for QA considers the threshold to be violated if the Packet Loss Percentage is high for 20 out of 30 minutes. You define the high threshold value in the High Value field and the high duration in the High Duration field. NNM iSPI Performance for QA drops the oldest polled value and adds the most recent value each time the metric value reaches the High Duration Window. This method is called Sliding Window method, where only the newest set of values are considered for the thresholds. While specifying this value follow these guidelines: ▪ This value must be greater than 0 (zero). ▪ This value can be same as the High Duration value.

Select the following to generate an incident when the time based threshold or count based threshold value is violated:

Field Name	Description
Generate Incident	Select this option if you want NNM iSPI Performance for QA to generate an incident for count based or time based threshold violations. By default this option is selected.

4. Use any one of the following options to complete the task:

Icons	Description
Close	Closes the Add Threshold Settings form without saving the threshold information you have entered.
Save and Close	Saves the threshold information and closes the Threshold Settings form

5. Continue modifying the threshold in the Edit CBQoS Threshold Configuration form.

If you modify the threshold settings or update the monitored metrics, NNM iSPI Performance for QA applies the changes in the next polling cycle. For example, You have a threshold T1 that monitors the metric Dropped Packets. If you changed the configured threshold value for the metric from 5 to 10, NNM iSPI Performance for QA applies the changes in the next polling cycle.

However, NNM iSPI Performance for QA does not delete the incidents that are already generated for an existing threshold. For example, if an incident was already generated for threshold T1, NNM iSPI Performance for QA does not delete the incident when the metric value is changed from 5 to 10.

Saving the Threshold Using the Edit Threshold Configuration Form

Use any one of the following options to complete modifying the threshold:

Icons	Description
Close	Closes the Add Threshold Configuration form without saving the threshold information you have entered.
Save and Close	Saves the threshold information and closes the Threshold Configuration form

To view the changes, in the CBQoS Threshold Configuration form, click **Refresh**

Check the following log file if you see an error:

UNIX:*$NnmDataDir/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

Deleting an Existing CBQoS Threshold Using the Threshold Configuration Form

To delete an existing CBQoS threshold:

1. Launch the CBQoS Threshold Configuration form.
2. Select a threshold in the **Threshold Settings** panel and click **Delete**.
3. Click **Refresh** in the Configured CBQoS Thresholds panel to view the changes.

However, NNM iSPI Performance for QA does not delete the incidents that are already generated for an existing threshold.

Deleting All Existing CBQoS Thresholds

To delete all the existing thresholds:

1. Launch the CBQoS Threshold Configuration form.
2. Click ✕ Delete All **Delete All**.
3. Click **Refresh** in the Configured CBQoS Thresholds panel to view the changes.

However, NNM iSPI Performance for QA does not delete the incidents that are already generated for the existing thresholds.

Importing CBQoS Thresholds

To import threshold configurations from an XML file:

1. Launch the CBQoS Threshold Configuration form.
2. Click Import **Import**.
3. In the user prompt dialog, enter the file name from where you want to import the CBQoS threshold configuration information.

   You must enter the file name with full path information; for example, `C:\temp\CBQoSthreshold_conf.xml`
4. Click **OK** in the user prompt dialog.

   If a threshold is already defined and displayed in the CBQoS Threshold Configuration panel, the import utility does not import the configuration information for this threshold from the XML file.

You can also import threshold configuration information using the following command line utility:

UNIX: *$NnmInstallDir/bin/nmsqathresholdconfigutil.ovpl –u <username> –p <password>–import –type cbqos <filename>*

Windows: *%NnmInstallDir%\bin\nmsqathresholdconfigutil.ovpl –u <username> –p <password>–import –type cbqos <filename>*

If the threshold import fails, check the following log files:

UNIX: *$NnmDataDir/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

Exporting a CBQoS Threshold

To export the existing threshold configurations to an XML file:

1. Launch the CBQoS Threshold Configuration form.
2. Click Export **Export**.
3. Type the file name where you want to export the existing CBQoS threshold configuration in the user prompt dialog.

   You must type the file name with full path information; for example, `C:\temp\CBQoSthreshold_conf.xml`

   If you type the XML file name without entering the absolute path, by default the file gets saved in the following directory:

   UNIX: *$NnmDataDir/shared/qa/conf*

Windows : *%NnmDataDir%\shared\qa\conf*

4. Click **OK** in the user prompt dialog.

You can also export the existing CBQoS threshold configuration using the following command line utility:

UNIX: *$NnmInstallDir/bin/nmsqathresholdconfigutil.ovpl –u <username> –p <password> –export –type cbqos <filename>*

Windows: *%NnmInstallDir%\bin\nmsqathresholdconfigutil.ovpl –u <username> –p <password> –export –type cbqos <filename>*

The threshold export utility does not export a threshold unless the threshold is associated with at least one site.

If the threshold export fails, check the following log files:

UNIX:*$NnmDataDir/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

NNM iSPI Performance for QA for QA Groups Threshold Configuration

NNM iSPI Performance for QA enables you to track the health and performance of the QA groups, which you have configured and discovered. You can configure thresholds for both QA probes and CBQoS probes, and create incidents whenever the performance value assigned to the QA groups breaches the threshold.

NNM iSPI Performance for QA performs the following actions, if a threshold is breached:

- Sets the QA Groups (QA Probes or CBQoS) probes’ status to major.
- Creates an incident for the violated threshold.
- Retains the threshold state as Nominal, or sets the threshold state to High or Low depending on the count based, or time based threshold configuration.

You can monitor the QA Groups entities for both QA Probes and CBQoS, and generate an incident based on the count based threshold configuration or time based threshold configuration.

Threshold Configuration

Count Based Threshold Configuration

You can generate an incident based on the count or number of consecutive times a metric violates the threshold value. You can define this count in the Threshold Configuration form, and you can specify to trigger an incident when the threshold violation exceeds this count.

Time Based Threshold Configuration

Time based threshold configuration enables you to raise an alert when the threshold breached state persists for more than a specific time period. This is derived by specifying X as the duration of time in minutes when the metric is in a threshold breached state within Y number of minutes specified in the sliding window. Based on your choice, you can trigger an incident if required.

Example for Time Based Threshold Configuration

Consider a scenario, where the polling interval is 5 minutes; High duration is 10 minutes; and High Duration Window is 60 minutes. In this scenario, an incident is generated whenever the High Duration exceeds 10 minutes within the 60 minute duration. NNM iSPI Performance for QA uses a sliding window wherein each time the High Duration (10 minutes) is reached, NNM iSPI Performance for QA drops the oldest polled value (first 5 minutes) and adds the most recent (between 60 to 65 minutes). This procedure continues and enables you to determine time based threshold violation.

You can make utmost use of the Time based threshold violation by ensuring that the duration specified in the sliding window is greater than or equal to the polling interval.

Baseline Settings Configuration

Baseline Deviation Settings Configuration

Apart from the time based and count based threshold configuration, you can also do a baseline monitoring based on the baseline deviation setting configuration in NNM iSPI Performance for QA. You can do a baseline deviation setting configuration for the selected probe, service, and metric. An incident is generated and the baseline state transitions to Abnormal Range only if it meets all the criteria listed below:

- Exceeds the count or the number of standard deviation that is above the average value for the metric, or exceeds the count or the number of standard deviation that is below the average value for the metric.This count is specified in the Upper Baseline Limit Deviations or the Lower Baseline Limit Deviations in the baseline deviation settings configuration
- Exceeds the duration for which the upper or lower baseline deviation persists in the specified sliding window duration

Adding New QA Group Threshold Settings

To add a new QA Groups threshold:

1. Launch the CBQoS Threshold Configuration Form
2. Click **New** in the CBQoS Threshold Configuration form panel. The Add CBQoS threshold configuration form opens.
3. Specify the following to configure the threshold:

Field Name	Description
Name	The name of the Threshold setting. The name should be unique.
Ordering	Specify a numeric value. NNM iSPI Performance for QA checks the configuration settings in the order you define (lowest number first).
Threshold Type	In the Threshold Type, select **QA Group Based**.
QA Group condition	Lists the configured and discovered CBQoS Probes that belong to the QA Group. You can select any one of the configured and

Field Name	Description
	discovered CBQoS QA Groups, from the drop down list to configure the threshold.

3. You can perform the following tasks in the **CBQoS Threshold Configuration** form.

Icons Available in the Threshold Settings Tab	Description
New	Adds a new QA Group threshold
Edit	Edits an existing QA Group threshold
✕ Delete	Deletes an existing QA Group threshold
Refresh	Retrieves the last saved threshold configuration from the database and displays the data
✕ Delete All Delete All	Deletes all existing QA Group thresholds

Creating New QA Group for CBQoS Threshold Settings

To add a new threshold:

1. Specify all the mandatory fields in the Adding New QA Group Threshold Settings
2. Click **New** in the **Threshold Settings** tab.

   The Add Threshold settings form opens.
3. Specify the following to configure the threshold settings:

Field Name	Description
Type	Select the type of threshold violation. The valid types are Count Based and Time Based.
Metric	Select the metric for which you are configuring the threshold. The metrics are populated based on the service.

After you select the metric to configure the threshold, the list of fields relevant to the selected metric appear. You can specify the following values to configure the new threshold:

Field Name	Description
High Value	Enter the threshold value. This value indicates the maximum value above which the metric will be considered to have violated the Nominal range. For Packet Loss metric, enter the High Value in percentage.
High Value Rearm	Enter the high value rearm for the threshold. For Packet Loss metric, enter the High Value Rearm in percentage. The High Value Rearm is used to indicate the end of the high threshold state and NNM iSPI Performance for QA clears the incident once it reaches below this value. The high value rearm must always be lower than the high value. **Example** For the Discarded Packets percentage, you must generate an incident when the percentage is 90 and clear the incident when the percentage comes down to 60. Set the following values for the threshold: ▪ High Value: `90` ▪ High Value Rearm: `60` This value enables you to be aware when a network performance problem starts to improve.

Field Name	Description
Trigger Count	Specify after how many consecutive threshold violations NNM iSPI Performance for QA must alert the operator by transitioning the threshold state to 🟥 High.

The following fields appear if you selected the Type as Time Based:

Field Name	Description
High Duration	Enter the minimum amount of time for which the QA probes must report high metric values. For example if you specify this value to be 20 minutes for Packet Loss Percentage metric, NNM iSPI Performance for QA considers the threshold to be violated if the Packet Loss Percentage is high for 20 minutes. You define the high threshold value in the High Value field. Set the polling interval as less than or equal to the high duration value.
High Duration Window	Define a window for the high duration value. For example, if you specify this value to be 30 minutes for Packet Loss Percentage metric, NNM iSPI Performance for QA considers the threshold to be violated if the Packet Loss Percentage is high for 20 out of 30 minutes. You define the high threshold value in the High Value field and the high duration in the High Duration field. NNM iSPI Performance for QA drops the oldest polled value and adds the most recent value each time the metric value reaches the High Duration Window. This method is called Sliding Window method, where only the newest set of values are considered for the thresholds. While specifying this value follow these guidelines: ■ This value must be greater than 0 (zero). ■ This value can be same as the High Duration value.

4. Select the following to generate an incident when the time based threshold or count based threshold value is violated:

Field Name	Description
Generate Incident	Select this option if you want NNM iSPI Performance for QA to generate an incident for count based or time based threshold violations. By default this option is selected.

5. Use any one of the following options to complete the task:

Icons	Description
Close	Closes the Add Threshold Configuration form without saving the threshold information you have entered.
Save and Close	Saves the threshold information and closes the Threshold Configuration form

After you configure the threshold settings, you can view the configured threshold details in the **Configured CBQoS Thresholds** tab.

6. Continue creating the threshold in the Add CBQoS Threshold Configuration form.

7. After you configure the threshold settings, Click Apply Threshold Now **Apply Threshold Now** in the CBQoS Threshold Configuration form, to apply the configured thresholds.

Editing the Existing QA Group Threshold Setting

To edit an existing QA Group threshold:

1. Launch the CBQoS Threshold Configuration Form

2. Select the configured threshold settings to modify, and click **Edit** in the CBQoS Threshold Configuration form.

   The Edit CBQoS threshold configuration form opens.

3. Specify the following to configure the threshold:

Field Name	Description
Name	The name of the Threshold setting. The name should be unique.
Ordering	Specify a numeric value. NNM iSPI Performance for QA checks the configuration settings in the order you define (lowest number first).
Threshold Type	In the Threshold Type. select **QA Groups Based.**
QA Group condition	Lists the configured and discovered CBQoS QA Groups. You can select any one of the configured and discovered CBQoS QA Groups, from the drop down list.

You can perform the following tasks in the **CBQoS Threshold Configuration** form.

Icons Available in the Threshold Settings Tab	Description
New	Adds a new QA Groups Threshold Setting
Edit	Edits an existing QA Groups Threshold Setting

Icons Available in the Threshold Settings Tab	Description
✖ Delete	Deletes an existing QA Groups Threshold Setting
⟳ Refresh	Retrieves the last saved threshold configuration from the database and displays the data
✖ Delete All Delete All	Deletes all existing QA Groups Thresholds Setting

Editing an Existing QA Group for CBQoS Threshold Setting

To edit an existing threshold setting:

1. Specify all the mandatory fields in Editing the QA Group for CBQoS Threshold Settings.
2. Select the threshold setting to modify, and Click **Edit** in the **Configured CBQoS Thresholds** panel.

   The Edit CBQoS Threshold Settings form opens.
3. Specify the following to configure the threshold settings:

Field Name	Description
Type	Select the type of threshold violation. The valid types are Count Based and Time Based.
Metric	Select the metric for which you are configuring the threshold. The metrics are populated based on the service.

4. After you select the metric to configure the threshold, the list of fields relevant to the selected metric appear. You can specify the following values to configure the new threshold:

Field Name	Description
High Value	Enter the threshold value. This value indicates the maximum value above which the metric will be considered to have violated the Nominal range. For Packet Loss metric, enter the High Value in percentage.
High Value Rearm	Enter the high value rearm for the threshold. For Packet Loss metric, enter the High Value Rearm in percentage. The High Value Rearm is used to indicate the end of the high threshold state and NNM iSPI Performance for QA clears the incident once it reaches below this value. The high value rearm must always be lower than the high value. **Example** For the Discarded Packets percentage, you must generate an incident when the percentage is 90 and clear the incident when the percentage comes down to 60. Set the following values for the threshold: ▪ High Value: `90` ▪ High Value Rearm: `60` This value enables you to be aware when a network performance problem starts to improve.

The following field appears, if you selected the Type as Count Based:

Field Name	Description
Trigger Count	Specify after how many consecutive threshold violations NNM iSPI Performance for QA must alert the operator by transitioning the threshold state to 🟥 High.

The following fields appear if you selected the Type as Time Based:

Field Name	Description
High Duration	Enter the minimum amount of time for which the QA probes must report high metric values. For example if you specify this value to be 20 minutes for Packet Loss Percentage metric, NNM iSPI Performance for QA considers the threshold to be violated if the Packet Loss Percentage is high for 20 minutes. You define the high threshold value in the High Value field. Set the polling interval as less than or equal to the high duration value.
High Duration Window	Define a window for the high duration value. For example, if you specify this value to be 30 minutes for Packet Loss Percentage metric, NNM iSPI Performance for QA considers the threshold to be violated if the Packet Loss Percentage is high for 20 out of 30 minutes. You define the high threshold value in the High Value field and the high duration in the High Duration field. NNM iSPI Performance for QA drops the oldest polled value and adds the most recent value each time the metric value reaches the High Duration Window. This method is called Sliding Window method, where only the newest set of values are considered for the thresholds. While specifying this value follow these guidelines: ▪ This value must be greater than 0 (zero). ▪ This value can be same as the High Duration value.

Select the following to generate an incident when the time based threshold or count based threshold value is violated:

Field Name	Description
Generate Incident	Select this option if you want NNM iSPI Performance for QA to generate an incident for count based or time based threshold violations. By default this option is selected.

5. Use any one of the following options to complete the task:

Icons	Description
Close	Closes the Edit Threshold Configuration form without saving the threshold information you have entered.
Save and Close	Saves the threshold information and closes the Threshold Configuration form

6. Click **Refresh** to view the changes in the **Configured CBQoS Thresholds** tab.
7. Click **Save** or **Save and Close** in the CBQoS Threshold Configuration form.
8. Click Apply Threshold Now **Apply Threshold Now** to enable the threshold.

Deleting an Existing QA Group Threshold Setting

To delete an existing QA Group for CBQoS threshold:

1. Launch the CBQoS Threshold Configuration Form.
2. Select one or more configured threshold settings in the **Configured CBQoS Thresholds** tab, and click **Delete**.
3. Click **Refresh** in the CBQoS Threshold Configuration panel to view the changes.

However, NNM iSPI Performance for QA does not delete the incidents that are already generated for an existing threshold.

Deleting all Existing QA Group Thresholds

To delete all existing QA Group thresholds:

1. Launch the CBQoS Threshold Configuration Form.
2. Click Delete All
3. Click **Refresh** in the CBQoS Threshold Configuration panel to view the changes.

However, NNM iSPI Performance for QA does not delete the incidents that are already generated for an existing threshold.

Importing QA Group Thresholds

To import threshold configurations from an XML file:

1. Launch the CBQoS Threshold Configuration Form.
2. Click Import **Import**.

3. In the user prompt dialog, enter the file name from where you want to import the QA Groups for CBQoS threshold configuration information.

   You must enter the file name with full path information; for example, `C:\temp\QAGroupCBQoSthreshold_conf.xml`

4. Click **OK** in the user prompt dialog.

   If a threshold is already defined and displayed in the Configured CBQoS Thresholds panel, the import utility does not import the configuration information for this threshold from the XML file.

You can also import threshold configuration information using the following command line utility:

UNIX: *$NnmInstallDir/bin/nmsqathresholdconfigutil.ovpl –u <username> –p <password> –import –type cbqos <filename>*

Windows: *%NnmInstallDir%\bin\nmsqathresholdconfigutil.ovpl –u <username> –p <password> –import –type cbqos <filename>*

If the threshold import fails, check the following log files:

UNIX: *$NnmDataDir/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

Exporting the QA Group Thresholds

To export the existing QA Group threshold configurations:

1. Launch the CBQoS Threshold configuration Form.
2. Click Export **Export**.
3. Type the file name where you want to export the existing QA Groups for CBQoS threshold configurations in the user prompt dialog.

   You must type the file name with full path information; for example, `C:\temp\QAGroupsCBQoSthreshold_conf.xml`

   If you type the XML file name without entering the absolute path, by default the file gets saved in the following directory:

   UNIX: *$NnmDataDir/shared/qa/conf*

   Windows : *%NnmDataDir%\shared\qa\conf*

4. Click **OK** in the user prompt dialog.

You can also export the existing QA Groups for CBQoS threshold configurations using the following command line utility:

UNIX: *$NnmInstallDir/bin/nmsqathresholdconfigutil.ovpl –u <username> –p <password> –export –type cbqos <filename>*

Windows: *%NnmInstallDir%\bin\nmsqathresholdconfigutil.ovpl –u <username> –p <password> –export –type cbqos <filename>*

The threshold export utility does not export a threshold unless the threshold is associated with a QA Group.

If the threshold export fails, check the following log files:

UNIX: *$NnmDataDir/log/qa/qa.log*

Windows: *%NnmDataDir%\log\qa\qa.log*

NNM iSPI Performance for QA CBQoS Discovery Filter Configuration

You may have numerous CBQoS elements (policies and classes) configured in your entire network. You may not need all of these CBQoS elements to analyze, monitor, or measure the performances of the business-critical network elements. So, you can restrict NNMi to discover, and NNM iSPI Performance for QA to monitor only a required set of CBQoS elements enforced in a network environment.

This feature allows you to exclude the CBQoS elements that may not be required for monitoring the network performance.

The Discovery Filter Configuration enables you to filter the discovery process, and exclude the CBQoS elements based on the following attributes:

- CBQoS Policy Name
- CBQoS Class Name
- IP Range
- Node Group
- CBQoS Action Name

If you filter the CBQoS elements based on different attributes, the CBQoS elements are excluded or filtered only if it fulfills **all** the criteria specified in the discovery filter. For example, if you create a CBQoS discovery filter called Filter A based on Class Name, and Node Group, the discovery filter ensures that it meets both the criteria and excludes only those CBQoS elements.

You can also configure discovery filters for the following policy types:

- A parent policy, that is, a policy that contains references to other policies, known as child policies. You can define discovery filters only on the parent policies. However, NNM iSPI Performance for QA applies the parent policy filters on the classes configured for the child policies too.
- An independent policy, that is, a policy that does not refer to any other policies.

After creating the filters, NNM iSPI Performance for QA stops polling the filtered CBQoS interfaces, policies, classes, and actions in the next polling cycle. As a result, the excluded CBQoS elements get excluded from the related views.

You cannot apply CBQoS discovery filters in a Global Network Management environment. The CBQoS discovery filters applied in the regional manager do not get reflected in the global manager. Similarly, the CBQoS discovery filters applied on the global manager applies only on the data polled by the global manager, and not on the data forwarded by the regional managers.

Launching the CBQoS Discovery Filter Configuration Form

To launch the discovery filter configuration:

1. Log on to NNMi console using your username and password.

   You must have administrator privileges.

2. Select **Configuration** workspace.
3. Select **Quality Assurance Configuration Console**

   The console opens.

4. In the **Configuration** workspace, select **CBQoS Discovery Filter**

   The CBQoS Discovery Filter Configuration form opens.

You can perform the following tasks using the CBQoS Discovery Filter Configuration form:

Icons Available in the CBQoS Discovery Filter Configuration Toolbar	Description
Close	Closes the CBQoS Discovery Filter Configuration form without saving the current configuration
Save	Saves the current configuration
Save and Close	Saves the current configuration and closes the CBQoS Discovery Filter Configuration form
Refresh	Retrieves the last saved CBQoS discovery filter configuration from the database
Export	Exports the existing CBQoS discovery filter configuration
Import	Imports CBQoS discovery filter configuration from an XML file
Apply Filter Now	Applies the updated discovery filter immediately on the discovered CBQoS elements. The CBQoS elements affected by the modified discovery filters are not discovered in the next discovery cycle. By default NNM iSPI Performance for QA discovers the changes in the discovery filters during each discovery cycle, and applies them on the respective CBQoS element. Clicking this button applies the following changes to the discovery filter:

Icons Available in the CBQoS Discovery Filter Configuration Toolbar	Description
	• If you create a new CBQoS discovery filter • If you edit an existing CBQoS discovery filter to associate it to a new policy, class, action, IP address range, or node group • If you delete existing CBQoS discovery filters After you apply the discovery filter, run the discovery process to refresh the CBQoS Policies Inventory view based on the newly applied filters.
Icons Available in the Configured Filters Tab	**Description**
New	Adds a new CBQoS discovery filter
Edit	Edits an existing CBQoS discovery filter
Delete	Deletes an existing CBQoS discovery filter
Refresh	Retrieves the last saved CBQoS discovery filter configuration from the database and displays the data in the Configured Filters panel
✕ Delete All Delete All	Deletes all existing CBQoS discovery filters

Adding a New CBQoS Discovery Filter Using the CBQoS Discovery Filter Configuration Form

To add a new CBQoS discovery filter:

1. Launch the CBQoS Discovery Filter Configuration form.
2. Click **New** in the **Configured Filters** panel in the CBQoS Discovery Filter Configuration form.

   The Add CBQoS Discovery Filter form opens.
3. Specify the following criteria. The CBQoS elements are excluded or filtered only if they fulfill all the criteria specified in this form. For example, if you specify the filters based on Policy Name and Node Groups, the discovery filter ensures that it meets both the criteria and excludes only those CBQoS elements.

a. **CBQoS Filter Name**

   A unique name to identify the CBQoS discovery filter. The name must not contain ' (single quotation marks) or special characters. This field supports only alphanumeric characters.

b. **Policy Name**

   Name of the Policy map for the CBQoS element that you want to exclude from the next discovery

   After specifying a policy name, click any of the following buttons:

   - Click Add **Add**. The policy name is added to the list of policy names.
   - You can select a policy name, and click Delete to remove it from the list of policy names.
   - You can click Delete All **Delete All** to remove all the policy names from the list.

c. **Class**

   Name of the class configured for the CBQoS element that you want to exclude from the next discovery. For example, if you do not want to discover the classmap called ClassDefault, you can use this criteria to stop polling all CBQoS elements that have this classmap configured.

   After specifying a class name, click any of the following buttons:

   - Click Add **Add** to add the class name to the list of class names.
   - You can select a class name, and click Delete to remove it from the list of class names.
   - You can click Delete All **Delete All** to remove all the class names from the list.

d. **Action**

   Name of the action configured on the CBQoS elements that you want to exclude from the next discovery

   After specifying a action, click any of the following buttons:

   - Click Add **Add** to add the action to the list of actions.
   - You can select a action, and click Delete to remove it from the list of actions.
   - You can click Delete All **Delete All** to remove all the actions from the list.

e. **IP Range**

   The IP address range for the CBQoS elements that you want to exclude from the next discovery.

   Follow the rules as discussed below, while defining a IP address range:

   - For IPv4 addresses you can use "**-**" (the character hyphen) while defining a range of IPv4 addresses.

- Specify the range in ascending order. The range must be from a lower value to a higher value.
- For IPV4 addresses use the wild card character "*" to specify IP addresses between 0 to 255.
- For both IPv4 and IPv6, specify an IP address range using "-" (hyphen).
- For both IPv4 and IPv6, specify the IP address range in ascending order. For example, `16.*.*,17.1-100.*.*`.
- For IPv4, addresses like `0.0.0.0` and `127.0.0.1` are considered as invalid.
- For IPv6 addresses use the **standard IPv6 shorthand notation**.

After specifying an IP range, click any of the following buttons:

- Click Add **Add** to add the IP range to the list of IP ranges.
- You can select an IP range, and click Delete to remove it from the list of IP ranges.
- You can click Delete All **Delete All** to remove all the IP ranges from the list.

f. **Node Group**

The node group name for the CBQoS elements that you want to exclude from the next discovery

You must create a CBQoS node group in NNMi before using the node group for creating a discovery filter.

After specifying a node group, click any of the following buttons:

- Click Add **Add** to add the node group to the list of node groups.
- You can select a node group, and click Delete to remove it from the list of node groups.
- You can click Delete All **Delete All** to remove all the node groups from the list.

NNM iSPI Performance for QA enables you to use wildcard characters to define a discovery filter criteria.

4. Click any of the following buttons to complete the task:

Icons	Description
Close	Closes the CBQoS Discovery Filter Configuration form without saving the filter information you have entered.
Save	Saves the new CBQoS discovery filter information
Save and Close	Saves the CBQoS discovery filter information and closes the CBQoS Discovery Filter Configuration form

Editing a CBQoS Discovery Filter Using the CBQoS Discovery Filter Configuration Form

To edit a discovery filter:

1. Launch the Discovery Filter Configuration form .
2. Select a filter in the in the **Configured Filters** tab in the CBQoS Discovery Filter Configuration Form, and click **Edit**.

   The Edit CBQoS Discovery Filter form opens.
3. Update the following values as required:
   a. **CBQoS Filter Name**
   b. **Policy Name**
   c. **Class**
   d. **Action**
   e. **IP Range**
   f. **Node Group**

   For details about these fields, see Adding a New CBQoS Discovery Filter Using the CBQoS Discovery Filter Configuration Form.
4. Use any one of the following options to complete the task:

Icons	Description
Close	Closes the CBQoS Discovery Filter Configuration form without saving the filter information you have entered
Save	Saves the new CBQoS discovery filter information
Save and Close	Saves the CBQoS discovery filter information and closes the Discovery Filter Configuration form

Deleting an Existing CBQoS Discovery Filter Using the CBQoS Discovery Filter Configuration Form

To delete an existing CBQoS discovery filter:

1. Launch the Discovery Filter Configuration form.

2. Select one or more filters in the **Configured Filters** panel in the Discovery Filter Configuration Form, and click ✕ **Delete**.
3. Click ⟳ **Refresh** in the **Configured Filters** panel to view the changes.

After you delete a CBQoS discovery filter, the filtered CBQoS elements are discovered in the next discovery cycle.

To refresh the CBQoS Policies Inventory view based on the deleted filter immediately, run the discovery process after you delete the discovery filter.

Deleting All Existing CBQoS Discovery Filters Using the CBQoS Discovery Filter Configuration Form

To delete all the existing CBQoS discovery filters:

1. Launch the CBQoS Discovery Filter Configuration form
2. Click ✕ Delete All **Delete All**.
3. Click ⟳ **Refresh** in the **Configured Filters** panel to view the changes.

After you delete all CBQoS discovery filters, the filtered CBQoS elements are discovered in the next discovery cycle.

To refresh the CBQoS Policies Inventory view based on the deleted filters immediately, run the discovery process after you delete the discovery filters.

Exporting CBQoS Discovery Filter

To export the existing CBQoS discovery filter configurations to an XML file:

1. Launch the CBQoS Discovery Filter Configuration form.
2. Click Export **Export**.
3. In the user prompt dialog, enter the file name where you want to export the existing CBQoS discovery filter configuration.

   You must enter the file name with full path information; for example, `C:\temp\CBQoS_disco_filter_conf.xml`

   If you enter the XML file name without entering the absolute path, by default the file gets saved in the following directory:

   UNIX: *$NnmDataDir/shared/qa/conf*

   Windows: *%NnmDataDir%\shared\qa\conf*
4. Click **OK** in the user prompt dialog.

You can also export the existing CBQoS discovery filter using the following command line utility:

UNIX: *$NnmInstallDir/bin/nmsqadiscofilter.ovpl -u <username> -p <password> -c CBQoS -export <filename>*

Windows: *%NnmInstallDir%\bin\nmsqadiscofilter.ovpl -u <username> -p <password> -c CBQoS -export <filename>*

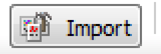
If the CBQoS discovery filter export fails, check the following log files:

UNIX: *$NnmDataDir/log/qa/qa.log*

Windows: *%NnmDataDir%\log\qa\qa.log*

Importing CBQoS Discovery Filters

To import CBQoS discovery filter configurations from an XML file:

1. Launch the CBQoS Discovery Filter Configuration form.
2. Click 

Import.
3. In the user prompt dialog, enter the file name from where you want to import the CBQoS discovery filter configuration information.

   You must enter the file name with full path information; for example, `C:\temp\CBQoS_disco_filter_conf.xml`
4. Click **OK** in the user prompt dialog.

   If a CBQoS discovery filter is already defined and displayed in the CBQoS Discovery Filter Configuration form, the import utility does not import the configuration information for this CBQoS discovery filter from the XML file.

You can also import discovery filter using the following command line utility:

UNIX: `$NnmInstallDir/bin/nmsqadiscofilter.ovpl -u <username> -p <password> -c CBQoS -import <filename>`

Windows: `%NnmInstallDir%\bin\nmsqadiscofilter.ovpl -u <username> -p <password> -c CBQoS -import <filename>`

If the CBQoS discovery filter import fails, check the following log files:

UNIX:.*$NnmDataDir/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

> **Note:** While you import a CBQoS discovery filter from the previous version of NNM iSPI Performance for QA, the discovery filter name is automatically generated in this version of NNM iSPI Performance for QA.

NNM iSPI Performance for QA Probe Maintenance

The probes that are discovered can be enabled, disabled, or deleted using the Probe Maintenance form.

Launching the Probe Maintenance Form

Perform the following steps to launch the Probe Maintenance form:

1. Log on to NNMi console using your username and password.

   You must have administrator privileges.

2. Select **Actions** → **Quality Assurance** → **Probe Maintenance**

   The Probe Maintenance form opens.

3. Enter the following Node details:

Field Name	Description
Hostname	Select the hostname of the source node.
Tenant Name	Specifies the NNMi tenant selected for the source node.
Write Community String	The write community string to use for authentication on the node.

The Probe Maintenance form displays four tabs on the top of the user interface; Probe List, Enable Status, Disable Status, and Delete Status.

Probe Maintenance Form: Probe List Tab

You can use the **Probe List** tab to do the following tasks for the selected source and destination node:

- Enable QA probes
- Disable QA probes
- Delete QA probes

To view the probe list:

1. Launch the Probe Maintenance form.
2. Click on the **Probe List** tab.

   You can view the following details:

Field Name	Description
Probe Status	The status of the QA probe.
Probe Name	The name of the QA probe.
Owner	The QA probe owner name.
Source Hostname	The hostname of the source node.

Field Name	Description
Destination IP Address	The destination IP address of the node.
Service	The service type of the QA probe. The valid service types are: ▪ **UDP Echo** ▪ **ICMP Echo** ▪ **UDP** ▪ **TCP Connect** ▪ **VoIP**
VRF Name	The name of the VRF.
ToS	The Type of Service specified in an IP packet header that indicates the service level required for the packet

3. Select any one of the following options:

Icons Available in the Probe List Tab	Description
Select All	Selects all the probes
Enable	Enables the selected probes and resumes the suspended operation
Disable	Disables the selected probes and suspends the operation
Delete	Deletes the selected probes from the device

Probe Maintenance Form: Enable Status Tab

You can use the **Enable Status** tab to do the following tasks for the selected source and destination node:

- View the probes that are enabled
- View the percentage of QA probes enabled in the status bar

To access the probes that are enabled:

1. Launch the Probe Maintenance form.
2. Click on the **Enable Status** tab.

You can view the following details:

Field Name	Description
Operational Status	The operational status of the QA probe.
Source Hostname	The hostname of the source node.
Probe Name	The name of the QA probe.
Owner	The QA probe owner name.
Status Details	The status of the QA probe.

You can view a status bar which displays the percentage of QA probes that are enabled.

Probe Maintenance Form: Disable Status Tab

You can use the **Disable Status** tab to do the following tasks for the selected source and destination node:

- View the disable status
- View the percentage of QA probes disabled in the status bar

To access the probe list:

1. Launch the Probe Maintenance form.
2. Click on the **Disable Status** tab.

   You can view the following details:

Field Name	Description
Operational Status	The operational status of the QA probe.
Source Hostname	The hostname of the source node.
Probe Name	The name of the QA probe.
Owner	The QA probe owner name.
Status Details	The status of the QA probe.

You can view a status bar which displays the percentage of QA probes that are disabled.

Probe Maintenance Form: Delete Status Tab

You can use the **Delete Status** tab to do the following tasks for the selected source and destination node:

- View the deletion status
- View the percentage of QA probes deleted in the status bar

To access the probe list:

1. Launch the Probe Maintenance form.
2. Click on the **Delete Status** tab.

   You can view the following details:

Field Name	Description
Operational Status	The operational status of the node.
Source Hostname	The hostname of the source node.
Probe Name	The name of the QA probe.
Owner	The QA probe owner name.
Status Details	The status of the QA probe.

You can view a status bar which displays the percentage of QA probes that are deleted.

NNM iSPI Performance for QA Discovery Filter Configuration

The error log files are available in the following directory:

UNIX:*./var/opt/OV/log/qa/qa.log*

Windows:*%NnmdataDir%\log\qa\qa.log*

QA probe filtering is not enabled. Please enable it.

Occurs if you have not enabled the Enable Discovery Filters option in the Discovery Filter Configuration form.

Reason and Resolution

Select the Enable Discovery Filters option in the Discovery Filter Configuration form.

Failed to import the discovery filter configuration. Please check the log files.

Occurs if the import file does not exist in the path you entered.

Reason and Resolution

NNM iSPI Performance for QA imports the discovery filter configuration from an XML file. If the file path is not correct, NNM iSPI Performance for QA fails to import the configuration information.

Check any of the following log files:

UNIX:*./var/opt/OV/log/qa/qa.log*

Windows:*%NnmdataDir%\log\qa\qa.log*

Failed to export the discovery filter configuration. Please check the log files.

Occurs if the export file path that you entered is incorrect.

Reason and Resolution

NNM iSPI Performance for QA exports the discovery filter configuration to an XML file. If the file path is not correct, NNM iSPI Performance for QA fails to export the configuration information.

Check any of the following log files:

UNIX:*./var/opt/OV/log/qa/qa.log*

Windows:*%nnmdatadir%\log\qa\qa.log*

Invalid QA probe owner name pattern.

Occurs if the Exclude Probe Owner Name Patterns field in the Discovery Filter Configuration form contains any illegal character.

Reason and Resolution

Avoid using '(Single quotation) as a QA probe owner name. NNM iSPI Performance for QA does not accept this character in a QA probe owner name.

Invalid Filter Name

Occurs when you try to save the discovery filter configuration details with an invalid filter name

Reason and Resolution

Avoid using '(Single quotation) in the filter name. NNM iSPI Performance for QA does not accept this character in a filter name.

Service Already Chosen

Occurs when you selected a service from the Service drop down list in the Discovery Filter Configuration form

Reason and Resolution

Do not select the same service again and add to the list.

HP Network Node Manager iSPI Performance for Quality Assurance Software Site Configuration

The error log files are available in the following directory:

UNIX:*./var/opt/OV/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

Failed to create the site. Please check the log files.

May occur for various reasons. Some of the reasons are as follows:

- If a site with the same name already exists. NNM iSPI Performance for QA recognizes a site by its name. Site names must be unique.
- If the IP address range is not valid.
- If the node group you specified does not exist in the NNMi database.

Reason and Resolution

Check any of the following log files:

UNIX:*./var/opt/OV/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

Invalid Probe Name Pattern

Occurs under any of the following circumstances:

- If the Probe Name Patterns field in the Add Site Configuration form contains any illegal character.
- If the Probe Name Patterns field in the Add Site Configuration form does not contain the delimiter "|" (VERTICAL BAR).

Reason and Resolution

- Avoid using '(SINGLE QUOTE) as a probe name pattern. NNM iSPI Performance for QA does not accept this character in a probe name pattern.
- You must use the delimiter to separate the source information and the destination information for the QA probe name pattern.

Ordering cannot be less than 0.

Occurs when you specify a negative site ordering. For example, -1 (MINUS ONE).

Reason and Resolution

The minimum site ordering accepted is 0 (ZERO).

Invalid Site Name

Occurs if the Site Name field in the Add Site Configuration form contains any illegal character.

Reason and Resolution

Avoid using '(SINGLE QUOTE) as a site name. NNM iSPI Performance for QA does not accept this character in a site name.

Failed to import the site configuration. Please check the log files.

Occurs under any of the following circumstances:

- If the import file does not exist in the path you entered.
- If a site is already defined and displayed in the Configured Sites panel.

Reason and Resolution

NNM iSPI Performance for QA imports the site configuration from an XML file. If the file path is not correct, NNM iSPI Performance for QA fails to import the configuration information.

Also the import utility does not import the site configuration if the configuration is unchanged since the last import

Check any of the following log files:

UNIX:.*/var/opt/OV/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

Failed to export the site configuration. Please check the log files.

Occurs if the export file path that you entered is incorrect.

Reason and Resolution

NNM iSPI Performance for QA exports the site configuration to an XML file. If the file path is not correct, NNM iSPI Performance for QA fails to export the configuration information.

Check any of the following log files:

UNIX:.*/var/opt/OV/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

Site name already exists, cannot add new site

Occurs when you try to save site configurations with a site name that already exists

Reason and Resolution

You must enter a unique name for the site in the Site Configuration form. Site names are unique for a manager or NNMi management server.

Invalid Node Group Name cannot add new site

Occurs when you enter an invalid Node Group Name in the Site Configuration form.

Reason and Resolution

Enter a valid node group name

Update failed, invalid node group specified

Occurs when you try to save the site details in the Edit Site Configuration form, and you specified an invalid node group

Reason and Resolution

You must enter a valid node group configured in NNMi

Unable to write/retrieve data from the server

Occurs due to any exceptions raised while retrieving data from the server

Reason and Resolution

Check any of the following log files:

UNIX:*./var/opt/OV/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

NNM iSPI Performance for QA Threshold Configuration

The error log files are available in the following directory:

UNIX:*./var/opt/OV/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

Selected different service type. Deleting all settings.

Occurs when you select a different service type, while creating a new threshold or editing an existing threshold.

Reason and Resolution

NNM iSPI Performance for QA creates threshold for a metric based on the service type you have selected. Metrics available for different service types are different. For example, if you select TCP Connect service type, you can set thresholds for only the **Round Trip Time (RTT)** metric.

Changing the service type for a threshold may need you to update the threshold values for all the metrics. NNM iSPI Performance for QA deletes all the metric threshold values you have set previously, if you select a different service type.

Configuration already has the possible settings. Cannot add more.

Occurs if you click **New** in the Threshold Settings panel of the Add Threshold Configuration form after creating a threshold.

Reason and Resolution

While creating a threshold, you performed the following steps:

1. Selected the following values in the Threshold Configuration panel in the Add Threshold Configuration form:

   a. Source Site

   b. Destination Site

   c. Service Type

2. Clicked **New** in the Add Threshold Settings panel.
3. In the Threshold Configuration form, you selected the metric, high value, low value, high value rearm, low value rearm, etc.
4. Selected **Save and Close** in the Threshold Configuration form. The threshold is added in the Threshold Settings panel of the Add Threshold Configuration form.
5. Clicked **New** in the Threshold Settings panel.

6. The system displays an error message saying "The threshold already has the possible settings. Cannot add more."

You cannot add more than one set of threshold settings for a threshold configuration.

Failed to import the threshold configuration. Please check the log files.

Occurs under any of the following circumstances:

- If the import file does not exist in the path you entered.
- If a threshold is already defined and displayed in the Site Wide Threshold Settings panel.

Reason and Resolution

NNM iSPI Performance for QA imports the threshold configuration from an XML file. If the file path is not correct, NNM iSPI Performance for QA fails to import the configuration information.

Also the import utility does not import the threshold configuration if the configuration is unchanged since the last import

Check any of the following log files:

UNIX:*./var/opt/OV/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

Failed to export the threshold configuration. Please check the log files.

Occurs under any of the following circumstances:

- If the export file path that you entered is incorrect.
- If the threshold is not associated with at least one site.

Reason and Resolution

NNM iSPI Performance for QA exports the threshold configuration to an XML file. If the file path is not correct, NNM iSPI Performance for QA fails to export the configuration information.

To define a threshold configuration you must associate it ti at least one source site. You may or may not associate the threshold to a destination site.

Check any of the following log files:

UNIX:*./var/opt/OV/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

Duration of poll window cannot be greater than duration of sliding window

Occurs when the duration of the sliding window or Window Duration is greater than the polling window.

Reason and Resolution

The polling window duration must be lesser than the sliding window duration

Duration should be between 0 and 1400 minutes(1day)

Occurs when the low duration or high duration value (in minutes) for a time based threshold is not within the range

Reason and Resolution

The Low Duration or the High Duration value(in minutes) for a time based threshold must be within the range 0 to 1400 minutes (equivalent to 1 day).

Duration should be between 0 and 60 seconds

Occurs when the low duration or high duration value (in seconds) is not within the range

Reason and Resolution

The Low Duration or the High Duration value(in seconds) must be within the range 0 to 60 seconds

Import failed, file not found

Occurs when you import a threshold configuration

Reason and Resolution

You must import by specifying the absolute path of the file, and you must check the XML filename as well. The file to be imported must be available on the NNMi management server.

NNM iSPI Performance for QA Global Network Management Configuration

The error log files are available in the following directory:

UNIX:.*/var/opt/OV/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

Regional manager name has to be specified before creating new connection

Occurs when you try to add a new connection without entering the Regional Manager Name in the Regional Manager Configuration form.

Reason and Resolution

Before entering the regional manager connection details, you must enter the Regional Manager name in the Regional Manager Configuration form of NNM iSPI Performance for QA.

No connections configured

Occurs when you try to save the Add Regional Manager Connections form without entering the details

Reason and Resolution

You must enter the details in the Add Regional Manager Connections form before saving the details

An error occurred while modifying regional manager connection

Occurs when you try to save the modified regional manager connection details in the Regional Manager Configuration form

Reason and Resolution

Check any of the following log files:

UNIX:.*/var/opt/OV/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

Invalid parameters for connection

Occurs when you try to save the regional manager connection details in the Regional Manager Configuration form

Reason and Resolution

Check the parameters entered in the Regional Manager connection form

Check any of the following log files:

UNIX:.*/var/opt/OV/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

Connection parameters cannot be empty

Occurs when you try to save the regional manager connection details without entering the mandatory fields in the Add Regional Manager Connection form

Reason and Resolution

Enter the mandatory fields in the Add Regional Manager Connection form

Invalid Regional manager connection configuration information provided. NNMi cannot connect to: {1} {0}

Occurs when you try to save the Regional Manager Configuration form

Reason and Resolution

Check if you have entered the correct hostname, username, and password

Duplicate Ordering

Occurs when you enter an ordering number in the Add Regional Manager Connection form that is assigned to some other regional manager connection

Reason and Resolution

You must enter an ordering number that is not assigned to some other regional manager connection

Failed to add connection {0} for regional manager {1}

Occurs when you try to save the regional manager connection details in the Add Regional Manager Connection form.

Reason and Resolution

Check any of the following log files:

UNIX:.*/var/opt/OV/log/qa/qa.log*

Windows:*%NnmDataDir%\log\qa\qa.log*

Valid Port Number ranges from 0 to 65535

Occurs when you try to save the regional manager connection details with invalid HTTP or HTTPS port number range

Reason and Resolution

You must enter the HTTP or HTTPS port number of NNM iSPI Performance for QA running on the Regional Manager . The valid range is between 0 to 65535, but you can use the port number range between 1024 to 65535 preferably.

Use Case for HP Network Node Manager iSPI Performance for Quality Assurance Software Threshold Configuration

Module	HP Network Node Manager iSPI Performance for Quality Assurance Software Threshold Configuration
Use Case Name	Configuring Site Based Thresholds for Two Way Jitter in VoIP Network
Use Case Author	HP Software

Summary

This use case provides a step by step process overview on creating threshold settings for two way jitter on a VoIP network.

Application

VoIP

Overview

To ensure end-to-end bandwidth with minimum jitter. If the two way jitter in the traffic flow is higher than 75, an incident will be generated.

Actors

- Network Administrator
- Capacity Planner
- Business Managers
- Network Designers
- Architects involved in deploying the network

Pre Condition

At least one site must be created before adding the threshold settings.

In this use case we have two sites, `SiteA` and `SiteB`. We need to monitor the two way jitter between these two sites.

Configure Threshold

- Initialize the process
- Process
- Process termination
- Post conditions
- Exceptions
- GUIs referenced

Assumptions

- User has administrative privileges to NNMi.
- User is using VoIP services to link between SiteA and SiteB.
- User wants to monitor the two way jitter(µsecs) between Site A and SiteB.
- Both SiteA and SiteB are created in the NNMi Performance SPI for Quality Assurance Site Configuration form.

Initialization

1. Log on to NNMi console using a username and password with administrator privileges.
2. From the workspace navigation panel, select **Configuration** workspace.
3. Select **Quality Assurance Configuration Console**.

   The console opens.
4. In the **Configuration** workspace, select **Site Based Threshold**

   The Threshold Configuration form opens.

Threshold Configuration Process

This section describes all the typical interactions that take place between the actor and this use case.

Format: If the actor selects `<selection>`, the system will request the actor to enter information.

Perform the following steps to add a new threshold to a site:

1. Launch the Threshold Configuration form. See "Threshold Configuration Process" (on page 335).
2. Click **New** in the Site Wide Threshold Settings panel.

   The Add Threshold Configuration form opens.
3. Specify the following information in the Threshold Configuration panel:

Field Name	Description
Source Site	Select `SiteA`.
Destination site	Select `SiteB`.
Service Type	Select `VoIP`.

   The new threshold you create is automatically assigned to the QA probes initiated from `SiteA` and run on the network elements in `SiteB`.
4. Click **New** in the Threshold Settings panel.

   The Add Threshold Settings form opens.
5. Specify the following values to configure the new threshold:

Field Name	Description
Type	Count Based
Metric	Two Way Jitter(µsecs)
High Value	75
High Value Rearm	70
Trigger Count	2
Generate Incident	Select this option

6. Click **Save and Close**

   The Add Threshold Settings form closes.
7. Click **Save** in the Site Wide Threshold Configuration form.
8. Click **Refresh** in the Threshold Settings panel to view the threshold for the Two Way Jitter.

Process Termination

1. Close the Add Threshold Configuration form by selecting any of the following options:
   - Click **Save and Close**
   - Click **Save** and then click **Close**.
2. Close the Threshold Configuration form by selecting any of the following options:
   - Click **Save and Close**.
   - Click **Save** and then click **Close**.

Exceptions

- You cannot create threshold settings if you do not have at least one site.
- If you do not select a destination site for the threshold settings, the settings will be applied to all the QA probes initiated from the source site.
- The new threshold will not be saved unless you click **Save and Close** in the Add Threshold Settings form.

Post Conditions

- The threshold settings are applied to the poller immediately once you complete creating a threshold.
- The HP Network Node Manager iSPI Performance for Quality Assurance Software applies the threshold for Two Way Jitter(µsecs) on all the QA probes run from SiteA and on SiteB.
- The NNM iSPI Performance for QA generates an incident if the Two Way Jitter(µsecs) crosses the high threshold value of 75 for two consecutive times.
- The Jitter column of the QA Probes view displays a **High** state.
- The Incident tab in the QA Probes form displays a ☒ **Critical** incident raised on the network element if an incident is raised.
- The Threshold State tab in the QA Probes form the threshold displays a **High** state.
- The Status tab in the QA Probes form displays the network element status as ▽ **Major**.
- The NNM iSPI Performance for QA clears the generated incident when the Two Way Jitter(µsecs) reaches the high value rearm of 70.
- The Incident tab in the QA Probes form reflects the change when an incident is cleared.
- The Threshold State tab in the QA Probes form the threshold displays a **Nominal** state.
- The Status tab in the QA Probes form displays the network element status as ✓ **Normal**.

You can view the threshold violated probes in the Threshold Exceptions probe view. In addition, you can view the report of the threshold violated probes view in the Network Performance server.

GUIs Referenced

- Quality Assurance Threshold Configuration form
- Add Threshold Configuration form
- Add Threshold Settings form

System Interface

HP Network Node Manager iSPI Performance for Quality Assurance Software console

Glossary

C

child policy

The policy that the parent policy refers to. NNM iSPI Performance for QA does not support hierarchical policies in Global Network Management environment.

D

delay

The time taken for a packet to travel from the sender network element to the receiver network element.

destination node

Usually the destination IRA node specifies the node, where you configured the Responder.

F

forwardable filters

The QA probes that are excluded and are not forwarded to the global manager based on the discovery filter

H

High

The QA probe measure for the network element performance crossed the High threshold value.

I

In policy

In Policy defines the policy which is applied to the incoming traffic.

In Policy

In Policy defines the policy which is applied to the incoming traffic.

L

link status

Links are unidirectional for the QA probes originating from the source to destination site. The color of the link is based on the threshold state of the probe for the selected service and metric. Note: In the case of a two-way jitter, the link color is based on the threshold state of the metric in the source, and destination sites

Local QA Probes

Local QA probes are QA probes owned by the local sites.

Local Sites

Sites configured in the local NNMi management server are referred to as Local Sites. The local sites are owned by the Manager on which it is configured.

Low

The QA probe measure for the network element performance crossed the Low threshold value.

N

network element

Some examples of network elements are routers, switches, and phone connections

network elements

Some examples of network elements are routers, switches, and phone connections

Nominal

The QA probes measure for the network element performance was within healthy range, or no thresholds are being monitored.

Not Polled

Indicates that this network element is not polled intentionally.

O

ODBID

ODBID is a custom attribute that the NNMi topology uses to integrate the NNMi topology with Business Service Management(BSM) software suite. The NNM iSPIs get this attribute from NNMi during the discovery and keep a reference. You can use ODBID as a report toplogy filter.

Out policy

Out Policy defines the policy which is applied to the outgoing traffic.

Out Policy

Out Policy defines the policy which is applied on the outgoing traffic.

P

parent policy

The policy that contains references to other policy configurations. NNM iSPI Performance for QA displays only one hierarchical level for policies. For example, Policy1 contains references for Policy2 and NNM iSPI Performance for QA considers Policy2 as the child policy of Policy1. If Policy2 contains references to Policy3, the inventory views do not display Policy3 as a child of Policy1. NNM iSPI Performance for QA does not support hierarchical policies in Global Network Management environment.

ping latency pair

A router-node pair used by the NNM iSPI Peformance for QA to measure and monitor the connectivity between the router and the node. The router-node pair definition must be available in a configuration file provided by the NNM iSPI Peformance for QA.

R

Remote QA Probes

Remote QA probes are primarily discovered and polled at the regional manager.

Remote Sites

Sites exported from the regional manager to the global manager are known as Remote Sites.

S

Site

A logical organization of networking devices. In the scope of enterprise networks, a site can be a logical grouping of networking devices generally situated in similar geographic location. The location can include a floor, building or an entire branch office or several branch offices which connect to head quarters or another branch office via WAN/MAN. Each site is uniquely identified by its name. In case of the service provider networks the Virtual Routing and Forwarding (VRF) on a Provider Edge (PE) router or a Customer Edge (CE) routers can be defined as a site.

site rules

Configuration associated to a site are called site rules. For example Node Group, Ordering, Test Name Pattern, etc are the site rules that are used to configure a site. The rules are prioritized inherently. The Node Group rule has the highest priority, the IP Address rule the second highest priority. Test Name Pattern rule has the third highest priority while the VRF Name rule has the the lowest priority among these four rules. Note that none of these rules have any dependency to each other. In other words, while creating a site, you can specify all or any of the the rules.

site status

sites

A logical organization of networking devices. In the scope of enterprise networks, a site can be a logical grouping of networking devices generally situated in similar geographic location. The location can include a floor, building or an entire branch office or several branch offices which connect to head quarters or another branch office via WAN/MAN. Each site is uniquely identified by its name. In case of the service provider networks the Virtual Routing and Forwarding (VRF) on a Provider Edge (PE) router or a Customer Edge (CE) routers can be defined as a site.

source node

Usually the source IRA node specifies the node, where you configured the UDP Jitter probe.

status

The status and coloring scheme of the map component is derived based on the most severe operational status of all the QA probes originating from the source map component for the selected service, and metric. A map component can be a site in Site Map or node in Node Map.

status

U

Unavailable

Unable to compute the performance state of the network element, or the computed value is outside the valid range.

hp

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