HP Network Node Manager i Software Smart Plug-in for MPLS

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

Software Version: 9.00

MPLS Reports Online Help

HP Network Node Manager i Software iSPI for MPLS

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Overview of the iSPI for MPLS Reports

The iSPI for MPLS uses the basic capabilities of the HP NNMi iSPI Performance for Metrics (iSPI Performance for Metrics) and Network Performance Server (NPS) to present the reports.

The iSPI for MPLS introduces the following extension packs:

- MPLS_LSR_Node
- MPLS_LSR_Interface
- L3_VPN_VRF

The extension packs provide you user-friendly reports that help you investigate and troubleshoot the performance of the traffic passing through an MPLS cloud in the network. The extension pack uses data collected by the iSPI for MPLS.

Types of Extension Pack

Report Type	Purpose
LSR Node	Shows report based on the available metric definitions for an MPLS-enabled node or nodes on the network.
LSR Interface	Shows report based on the available metric definitions for an MPLS- enabled interface or interfaces on the network.
L3_VPN_VRF	Shows report based on the available metric definitions for a VRF or an L3VPN on the network.

The iSPI for MPLS reports help you to perform the following tasks:

- Identify the number of MPLS packets and data bytes passing through an MPLS-enabled node, interface, VRF, or L3VPN.
- Investigate and troubleshoot the MPLS traffic congestion. You can use the drill-down reports to help you conclude the issue faster. Check the Top N report.
- Rank the network element (node, interface, VRF, or L3 VPN) based on the metric values. Check the Top N report.
- Monitor the important or critical nodes or interfaces or L3VPNs or VRFs in the network. Check the Most Changed or Top N report.
- Find the traffic patterns in the network. Check the Heat Chart report.
- Capacity planning for the MPLS-enabled nodes or interfaces or VRFs.
- Evaluate the traffic performance based on the MPLS metric values.
- Launch the MPLS reports from NNMi reports.

Related Topic:

Accessing the iSPI for MPLS Reports

Accessing the iSPI for MPLS Reports

The iSPI for MPLS reports are available from the HP NNMi iSPI Performance for Metrics Software console. You can access and view the MPLS reports after you install Network Performance Server (NPS) and iSPI Performance for Metrics from the NPS and iSPI Performance for Metrics DVD.

The following MPLS-specific tabs appear in the Report Menu page. You can use the following tabs to access the MPLS reports:

- MPLS LSR Node
- MPLS LSR Interface
- L3_VPN_VRF

You can select the policies and metric definitions for the MPLS reports from the iSPI Performance for Metrics console. Before you view the iSPI for MPLS reports, make sure that the HP NNMi iSPI Performance for Metrics software server is up and running.

To view the MPLS report by selecting an LSR node, an interface, or a VRF, follow these steps:

1. Navigate to the iSPI Performance for Metrics Software console.[1]

2. Select the type of the report (Calendar, Heat Chart, Chart Detail, Most Changed, or Top N) to view the MPLS report.

3. Select any one of the following time range:

    - **Hourly (H)** for the report showing information for past one hour.

    - **Daily (D)** for the report showing information for past one day.

    - **Weekly (W)** for the report showing information for past seven days.

    - **Monthly (M)** for the report showing information for past 30 days.

4. Select a report control to customize the report. These report control links appear in the Report Menu page. Each MPLS report provides the following control links to customize the report:

    - Time Controls

    - Options

If you select a node, and interface, or a VRF, you need not use the Topology Filters to set the filters again to launch reports.

For more information, see *iSPI for Metrics help, Report Controls*.

The MPLS report appears with the selected filters such as time controls, metrics, and options.

To view the MPLS report, follow these steps:

1. Navigate to the iSPI Performance for Metrics Software console.[2]

2. Click the **MPLS LSR Node** tab or the **MPLS LSR Interface** tab or the **L3_VPN_VRF** tab.

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[1]From the NNMi console, click **Actions**->**Reporting-Report Menu.** Select a node, an interface, or a VRF from the iSPI for MPLS inventory to view the context- specific MPLS report. Based on your selection, the report appears with the pre-filtered network element (node, interface, VRF, or L3VPN).
[2]From the NNMi console, click **Actions**->**Reporting-Report Menu.**

3. Select the type of the template report (Calendar, Heat Chart, Chart Detail, Most Changed, or Top N) to view the MPLS report.

4. Select any one of the following time range

   ▪ **Hourly (H)** for the report showing information for past one hour.

   ▪ **Daily (D)** for the report showing information for past one day.

   ▪ **Weekly (W)** for the report showing information for past seven days.

   ▪ **Monthly (M)** for the report showing information for past 30 days.

5. Select a report control to customize the report. Each MPLS report contains the following control links to customize the report:

   ▪ Time Controls

   ▪ Topology Filters

   ▪ Options

The MPLS report appears with the selected filters such as time controls, metrics, and options.

Related Topics:

MPLS LSR Node

MPLS LSR Interface

L3_VPN_VRF

Time Controls

You can select the time control filters from the iSPI Performance for Metrics console. Set the time range for your reports by the following options:

Time Control Filters

Option	Description
Date From: Start Date and Time	Select the date and time from the drop down box. By default, the date is set to the start date of the report. The report shows the time and date.
Time Range	Select the appropriate time from the Time Range box.
Display Grain	A time interval to show the MPLS report. For example, if you select 5 minute as your display grain, your report appears in the interval of five minute. To get appropriate reports, select your display grain from the following values: ● As Polled ● 1 minute ● 5 minutes ● Half Hour
Auto Refresh	Selecting an option automatically refreshes the report with the fresh samples of data.
Hour of Day	Select the hour for which you want to view your report.

Option	Description
Day of Week	Select the day for which you want to view your report.

MPLS LSR Interface Report Metrics

The following **Metrics** are available with the MPLS LSR Interface report:

Metric

Name	Description
Incoming Labels Used (average) (maximum) (mini-mum)	The number of labels received by the selected node.
Outgoing Labels Used (average) (maximum) (mini-mum)	The number of the labels sent out by the selected node.
Octets In (sum)	Total number of incoming bytes passing through the selected node.
Octets Out (sum)	Total number of outgoing bytes passing through the selected node.
Volume Octets (sum)	Total number of bytes passing through the selected node.
Packets In (sum)	Total number of packets received by the selected node.
Packets Out (sum)	Total number of packets sent out from the selected node.
Total Packets (sum)	Total number of packets passing through the selected node.
Discards Packets	The number of packets reaching late or not reaching the destination. These packets pass

Name	Description
In (sum)	through the selected node.
Discards Packets Out (sum)	The number of outgoing packets sent out late or not reaching the destination.These packets or bytes pass through the selected node.
Volume - Discards Packets (sum)	Total number of packets that are in the discarded state.

To view some useful reports, compare the following relevant metric:

Attributes

Metrics	Comparison Chart
Labels	Labels In and Labels Out
Packets	Packets In and Packets Out
Discards	Discards In and Discards Out
Volume and Labels	(Volume (sum) and Incoming Labels used) or (Volume (sum) or Outgoing Labels used)
Total Packets and Packets In or Out	(Total Packets and Packets In) or (Total Packets and Packets Out)
Volume - Discards and Discards Packets In / Out	(Volume - Discards Packets and Discards Packets In) or (Volume - Discards Packets and Discards Packets Out)

The following **Grouping By** options are available with the MPLS LSR Interface report:

Attributes

Name	Description
NodeGroup Name	The name of the node group. To enable the polling for the selected node group, see *Help for NNMi, Node Group Settings (NNM iSPI Performance)*.
InterfaceGroup Name	The name of the selected interface group. To enable the polling for the selected interface group, see *Help for NNMi, Interface Group Settings (NNM iSPI Performance)*.
Interface UUID	The Universally Unique Identifier of the selected interface.
Interface Name	The name of an interface on the node.
Qualified Interface Name	The name of the selected interface on the MPLS-enabled node.

[1]ODBID is a custom attribute that the HP Network Node Manager i Software uses to integrate the NNMi topology with Business Service Management(BSM) software suite.
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Name	Description
Interface Type	The kind of an interface.
Node UUID	The Universally Unique Identifier of the selected MPLS-enabled node.
Node Location	The place where the node is configured.
Node Contact	The node details as per the router configuration.
Node Family	The type of family of a node.
Node Vendor	The type of a node. Example, Cisco or Juniper node.
Node ODBID[1]	The key value of the selected node.
Interface ODBID [1]	The key value of the selected interface.

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[1]ODBID is a custom attribute that the HP Network Node Manager i Software uses to integrate the NNMi topology with Business Service Management(BSM) software suite.
[1]ODBID is a custom attribute that the HP Network Node Manager i Software uses to integrate the NNMi topology with Business Service Management(BSM) software suite.

Report Options

Select the report options from the iSPI Performance for Metrics console to customize your report. The Report Options are as follows:

Report Options

Option	Description
Primary Metric	The iSPI for MPLS report is based on at least one metric value. Select the primary metric from the **Metric** drop-down list. You can select the primary metric for the following reports: • Heat Report • Most Changed Report
Secondary Metric	The iSPI for MPLS report provides you an option to select two metrics. Select both metrics (Primary and Secondary) from the drop-down list. You can select the primary and secondary metric for the following reports: • Calendar Report • Chart Details Report • Top N Report
Top / Bottom N	Select number and order of network elements for the report. You can select the Top / Bottom N option for the following reports: • Top N Report • Most Changed Report
Grouping By	Select the network element based on which you want to group the report data. You can select more than one option to group your report. The Grouping by option is available for the following reports: • Top N Report • Most Changed Report
Display Time Series Chart	By default all reports display the time series chart. Select **No** if you want to disable this option.

For more information about metric definitions and topology filters, see

• MPLS LSR Node Report Metrics and Topology Filters

• MPLS LSR Interface Report Metrics and Topology Filters

• L3_VPN_VRF Report Metrics and Topology Filters

MPLS LSR Node Report

The MPLS LSR Node report helps you perform in-depth trend analysis for the traffic passing through the selected LSR node or nodes in the network. The MPLS LSR node report shows the incoming and outgoing traffic (packets, labels, packet discards, and bytes) passing through a node or nodes.

The iSPI for MPLS uses the template reports to show the MPLS reports. The available template reports are:

- Calendar Report
- Heat Chart Report
- Chart Detail Report
- Most Changed Report
- Top N Report
- Managed Inventory

Use the MPLS LSR Node report to perform the following tasks:

- Monitor the LSR node or nodes for MPLS packets and MPLS data bytes utilization in the network.

- Compare the incoming and outgoing traffic (packets, labels, and packet discards) for a node or nodes over a period of time. Check the Chart Detail report.

- Investigate and troubleshoot the nodes with the high exception counts (packets discarded or excessive utilization or both). For example, you can investigate if the packet discards are more than the expected value or if the volume of the packets passing through the selected node is more or irregular).

- Rank the node or nodes based on the selected metric value. Check the Top N report.

- Monitor the nodes by traffic volume.

Note: The label space configuration on the LSR node is at the node level, the interface level, or both. Depending upon the configuration, the metric value appears in the corresponding reports.

For example, the nodes with the node-level configuration will report the metric data only for the MPLS LSR Node report. The nodes with the interface-level configuration will report the metric data only for the MPLS LSR Interface report. The nodes with both (node and interface) configuration will report data in both MPLS LSR Node and MPLS LSR Interface report.

Related Topics:

MPLS LSR Node Report Metrics and Topology Filters

MPLS LSR Node Calendar Report

The MPLS LSR Node Calendar report helps you to monitor the traffic passing through the selected node or node groups for a specific time range. In addition, the report shows a comparative study of the selected metrics for a specific time range.

Use this report for the following:

- Monitor and compare the traffic performance for a node or nodes or node groups over a period of time.

- Identify a specific time period to find out any unusual behavior in the traffic passing through the LSR node.

Report Options

The Calendar report shows the following options:

- Primary Metrics[1]

- Secondary metrics[2]

For information about metric definitions, see MPLS LSR Node Metric Definitions.

For more information about how to use the report, see Using the MPLS LSR Calendar Report.

Using the iSPI for MPLS LSR Calendar Report

The following example demonstrates the use of a Calendar Report:

Find the total number of incoming and outgoing octets passing through the selected TE Tunnel Head.

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[1]Select the metric based on which you want to generate the report. The primary metric appears on the left Y axis of the report.
[2]Select the metric to compare your report. The secondary metric appears on the right Y axis of the report.

Check the MPLS LSR Node Calendar report to analyze the traffic passing through a TE Tunnel head configured on a node. If the outgoing bytes are less than the incoming bytes, may result in slow traffic.

To view the report, follow these steps:

1. Navigate to the HP NNMi iSPI Performance for Metrics Software console.[1]

2. Click the **MPLS_LSR_Node** tab or the **MPLS_LSR_Interface** tab.

3. Select one of the following time ranges for the Calendar report:

   ■ **Daily(D)** for the report showing information for past one day

   ■ **Weekly(W)** for the report showing information for past seven days

   ■ **Monthly(M)** for the report showing information for past 30 days

   In this case, we select **W**. For example, the Calendar report shows three time range options such as Daily (displayed as **D**), Weekly (displayed as W), and Monthly (displayed as **M**).

4. Click **Topology Filters** and select **TE Tunnel Head**.

5. Click **Options**and select the following metrics:

   ■ **Octets In (sum)** as the primary metric.

   ■ **Octets Out (sum)** as the secondary metric.

6. Select **Confirm Selection**.

The MPLS LSR Node Calendar report opens. The following sample report shows a weekly comparative report for the selected interface.

Note: This example is for the MPLS_LSR_Node Calendar Report. Similarly, to view the MPLS _LSR_Inteface Calendar report, select the metrics from the MPLS_LSR_Interface tab.

Heat Chart Report

The MPLS LSR Node Heat Chart report helps you to view the traffic performance based on a single metric over a time frame.

The heat chart shows different colors to display the different states of a metric. These states show traffic performance for the selected network element. For example, select a weekly Heat Chart report to view the performance of a metric **(Octets In (avg)** for the selected network element **(Node Name)**.

Use this report to perform the following tasks:

● Track the hourly performance of the traffic passing through an MPLS-enabled node.

● Quickly isolate and resolve problems affecting in the selected time range by the different colors.

Report Options

The Heat Chart report shows the following option:

Metric[2]

For information about metric definitions, see MPLS LSR Node Metrics.

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[1]From the NNMi console, click **Actions->Reporting-Report Menu**
[2]Select the metric based on which you want to view the report.

For more information about how to report, see Using the MPLS LSR Heat Chart Report.

Using the iSPI for MPLS LSR Heat Chart Report

The following example demonstrates the use of a Heat Chart Report:

Check the MPLS LSR Interface Heat report to find the total number of incoming discards packets for the selected qualified interface.

To view the Heat Chart report, follow the steps:

1. Navigate to the HP NNM iSPI Performance for Metrics Software console.[1]

2. Click the **MPLS_LSR_Interface** tab or the **MPLS_LSR_Node** tab.

3. Select one of the time ranges for the heat report. For example, select **D**

4. Click **Topology Filters** and select **Qualified Interface Name**

5. Click **Options** and select **Packets Discard In (sum)**.

6. Select **Confirm Selection.**

The MPLS LSR Interface Heat Chart report opens. The following sample report displays the different states of Packets Discard In (sum) for the selected qualified interface.

Note: This example is for MPLS_LSR_Interface Heat Chart Report. Similarly, to view the MPLS _LSR_ Node Heat Chart report, select the metrics from the MPLS_LSR_Node tab.

Chart Detail Report

The MPLS LSR Node Chart Detail report helps you compare the sampled data for any two metrics. For example, select a weekly Chart Detail report to compare the incoming and outgoing packets from the selected node.

Use this report to perform the following tasks:

- Analyze the trend of traffic flow passing through a node or node groups based on one unit of time. Each unit of time is called as a **Display Grain**. Each unit of time is known as a **Display Grain**. Make sure to set the display grain greater than the polling interval to view the correct report. You can measure the **Display Grain** as follows:

  - Five minutes for hourly report

  - One hour for daily report

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[1]From the NNMi console, click **Actions**->**Reporting-Report Menu**

- One day for weekly report

- One day for monthly report

- Compare the metrics for the selected network element over a period of time.

- Detect any persistent problem in the network.

Report Options

The Chart Detail report shows the following options:

- Primary Metrics [1]

- Secondary Metrics[2]

For information about metric definitions, see MPLS LSR Node Metrics.

For more information about how to use the report, see Using the MPLS LSR Chart Detail Report.

Using the iSPI for MPLS LSR Chart Detail Report

The following example demonstrates the use of a Chart Detail Report:

Find the total number of incoming and outgoing discarded packets for the selected interface.

To view the Chart Detail report, follow these steps:

1. Navigate to the HP NNM iSPI Performance for Metrics Software console.[3]

2. Click the **MPLS_LSR_Interface** tab or **MPLS_LSR_Node** tab.

3. Click **Topology Filters** and select **Qualified Interface Name**.

4. Click **Options** and select the following metrics:

   - **Packets Discard In (avg)** as the primary metric.

   - **Packets Discard Out (avg)** as the secondary metric.

5. Select **Confirm Selection**.

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[1]Select the main metric based on which you want to view the report. The primary metric appears on the left Y axis of the report.
[2]Select the metric to compare with the primary metric. The secondary metric appears on the right Y axis of the report.
[3]From the NNMi console, click **Actions**->**Reporting-Report Menu**

The MPLS LSR Interface Chart Detail report appears.

The Chart Detail report shows the following:

- X axis: Time Interval

- Y axis: Packets Discard In (avg) and Packets Discard Out (avg)

View if there is any significant increase or drop in the number of discard packets received or sent by the interface for the specific time interval. Check the iSPI for MPLS Inventory views for the incidents and status of the interface.

This report helps you in capacity management to view if the interface utilization is more than the expected traffic, you can route MPLS traffic from another interface.

Note: This example is for MPLS_LSR_Interface Chart Detail Report. Similarly, to view the MPLS _LSR_ Node Chart Detail report, select the metrics from the MPLS_LSR_Node tab.

Most Changed Report

The MPLS LSR Node Most Changed report helps you to compare one metric for two different (con-secutive) time frames. In addition, you can find the changes and growth percentage in the metric value for a node or nodes. For example, select a weekly Most Changed report to compare a metric **(Octets In (avg))** that is grouped by a network element **(Node Name)**.

Use this report to perform the following tasks:

- Monitor the change in the traffic performance for a node or nodes based on a metric value.

- Find out the change and growth rate of the traffic based on a metric value.

Report Options

The Most Changed report shows the following option:

- Top N[1]

- Metric[2]

- Grouping By[3]

For information about metric definitions, see MPLS LSR Node Metric Definitions.

For more information about how to use the report, see Using the MPLS LSR Most Changed Report.

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[1]Select the type of report from the available rank-list. The rank-list includes top or bottom 5,10, 25 ranks for the selected network element. The ranks are available either in ascending order or descending order.
[2]Select the metric based on which you want to view the report.
[3]Select an option to group the report data. You can select more than one option.

Using the iSPI for MPLS Most Changed Report

The following example demonstrates the use of a Most Changed Report:

Check the MPLS Most Changed report to find the incoming packets discards for the current and previous selected time period.

To view the MPLS Most Changed report, follow these steps:

1. Navigate to the HP NNM iSPI Performance for Metrics Software console.[1]

2. Click the **MPLS LSR Interface** tab or **MPLS_LSR_Node** tab.

3. Select one of the time ranges available for the Most Changed Report. In this case, we select **W**.

4. Click **Topology Filters** and select **Node Name**.

5. Click **Options** and select the following metrics:

   - **Packets Discards In** (avg) as the primary metric.

   - **Qualified Interface Name** as the Grouping by metric.

6. Select **Confirm Selection**.

The MPLS LSR Most Changed report appears. The sample report shows a weekly comparative study to find out the change in the metric value for current and pervious time range.

Note: This example is for MPLS_LSR_Interface Most Changed Report. Similarly, to view the MPLS _LSR_ Node Most Changed report, select the metrics from the MPLS_LSR_Node tab.

MPLS LSR Node Top N Report

The MPLS LSR Node Top N report ranks the MPLS-enabled nodes by the traffic volume. The report is based on a single metric and grouped by one or more network element. The Top N report lists the network elements in the descending order; that is from the highest value of the selected metric to the lowest value

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[1]From the NNMi console, click **Actions**->**Reporting-Report Menu**

of the selected metric. For example, select a daily Top l0 report to view the top 10 MPLS-enabled node with a metric value.

The Top N list includes the following:

- Top / Bottom 5 - Shows the Top / Bottom 5 horizontal bar graphs that provide values in descending or ascending order based on the selected metric.

- Top / Bottom 10 - Shows the Top / Bottom 10 horizontal bar graphs that provide values in descending or ascending order based on the selected metric.

- Top / Bottom 25 - Shows the Top / Bottom 25 horizontal bar graphs that provide values in descending or ascending order based on the selected metric. This helps to monitor traffic passing through the critical nodes.

- Top / Bottom 50 - Shows the Top / Bottom 50 horizontal bar graphs that provide values in descending or ascending order based on the selected metric. This helps to monitor traffic passing through the critical nodes.

- Top / Bottom 100 - Shows the Top / Bottom 100 horizontal bar graphs that provide values in descending or ascending order based on the selected metric. This helps to monitor traffic passing through the critical nodes.

Use this report to perform the following tasks:

- Analyze the ranks available for the network element based the selected metric values.

- Investigate and troubleshoot the nodes with the high exception counts (packets discarded and excessive utilization).

- Monitor the critical and important LSR node and nodes.

- Compare the network element with the selected metric values for a quick overview of the network. You can find the cause of network performance by using the drill-down reports.

Report Options

The Top N report shows the following options:

- Top N [1]

- Metric [2]

- Display Time Series Chart[3]

- Grouping By[4]

For information about metric definitions, see MPLS LSR Node Metrics.

For more information about how to use the report, see Using the MPLS LSR Top N Report.

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[1]Select the type of report from the available rank-list. The rank-list includes top or bottom 5,10, 25, 50, 100 ranks for the selected network element. The ranks are available either in ascending order or descending order.
[2]Select the main metric based on which you want to view the report. The primary metric appears on the left Y axis of the report.
[3]Select Yes to view the detail chart with the table. Select No to hide the chart and show only the graph. The Top N report shows the Time Series Chart.
[4]Select one or more network element from the available options.

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Using the iSPI for MPLS Top N Report

The following example demonstrates the use of a Top N Report:

Check the MPLS LSR Node Top N report to find the labels passing through the MPLS-enabled nodes located in XYZ region in the network. In addition, rank the LSR nodes by an order of the selected metric in the network.

To view the Top N report, follow the steps:

1. Navigate to the HP NNM iSPI Performance for Metrics Software console.[1]

2. Click the**MPLS LSR Node** tab.

3. Select one of the time ranges available for the Top N Report. In this case, we select **W**.

4. Click Topology Filters and select NodeGroup Name. (For example, Routers or Switches).

4. Click **Topology Filters** and select **NodeGroup Name.**

5. Click **Options** and select the following metrics:

    ■ **Incoming labels (avg)** as the primary metric.

    ■ **Node Vendor and Node Location** as the Grouping by metric.

6. Select **Confirm Selection**.

The Top N report appears that shows the ranking and percentage of all the NodeGroups (selected topology filter) in the network that are grouped by Node Vendor and Node Location.

Use the MPLS LSR Node Top N report to find the reason and cause of the drop in the incoming and outgoing labels of the selected node.

1. Navigate to the MPLS LSR Node Top N Report.

2. Click the Node that shows the low incoming labels. Select the type of template report as per your interest. For example, select the Chart Details report. Select the primary metric as Incoming labels (avg) and the secondary metric as Outgoing labels (avg). The Chart Details report appears.

The MPLS LSR Node Chart Detail report shows the following:

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[1]From the NNMi console, click **Actions**->**Reporting-Report Menu.**

- X axis: Time Interval

- Y axis: Incoming Labels Used (avg) and Outgoing Labels Used (avg)

View the significant drop or rise in the graph. Check the iSPI for MPLS Inventory views to view the incidents and status of the selected node.

Note: This example is for MPLS_LSR_Node Top N Report. Similarly, to view the MPLS _LSR_Interface Top N report, select the metrics from the MPLS_LSR_Interface tab.

MPLS LSR Node Report Metrics and Topology Filters

The following **Metrics** are available with the MPLS LSR Node report:

Metric

Name	Description
Incoming Labels Used (average) (maximum) (minimum)	The number of labels received by the selected node.
Outgoing Labels Used (average) (maximum) (minimum)	The number of the labels sent out from the selected node.
Octets In (sum)	Total number of incoming bytes received by the selected node.
Octets Out (sum)	Total number of outgoing bytes sent out from the selected node.
Volume Octets (sum)	Total number of bytes passing through the selected node.
Packets In (sum)	Total number of packets received by the selected node.
Packets Out (sum)	Total number of packets sent out from the selected node.
Total Packets (sum)	Total number of packets passing through the selected node.
Discards Packets In (sum)	The number of packets that are in discarded state (packets that reach late or not do not reach the destination).
Discards Packets Out (sum)	The number of outgoing packets that are in discarded state (packets that reach late or not do not reach the destination).
Volume - Discards Packets (sum)	Total number of the discarded packets.

Name	Description
TE Tunnel Head	The name of the TE Tunnel.
L2VPN-PE	The name of the L2VPN.
L3VPN-PE	The name of the L3VPN.

The following **Grouping By** options are available with the MPLS LSR Node report:

Attributes

Name	Description
NodeGroup Name	The name of the node group.
InterfaceGroup Name	The name of the selected interface group.
Interface UUID	The UUID of the selected interface.
Interface Name	Name of an interface on the node.
Qualified Interface Name	The name of the selected interface on the MPLS-enabled node.
Interface Type	The type of an interface.
Node UUID	The UUID of the selected MPLS-enabled node.
Node ODBID[1]	The key value of the selected MPLS-enabled node.
Node Location	The place where the node is configured.
Node Contact	The node details as per the router configuration.
Node Family	The type of family of a node.
Node Vendor	The type of a node. Example, Cisco or Juniper node.
L2VPN PE	This is the capability. Possible values are true or false.
L3VPN PE	This is the capability. Possible values are true or false.
TE Tunnel Head	This is the capability. Possible values are true or false.

To view some useful reports, compare the following relevant metric:

Attributes

Metric	Comparison Chart
Labels Used	Incoming Labels Used and Outgoing Labels Used
Packets	Packets In and Packets Out

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[1]ODBID is a custom attribute that the HP Network Node Manager i Software uses to integrate the NNMi topology with Business Service Management(BSM) software suite.

Metric	Comparison Chart
Discards	Discards In and Discards Out
Octets	Octets In and Octets Out
Volume and Labels	(Volume (sum) and Incoming Labels used) or (Volume (sum) or Outgoing Labels used)
Total Packets and Packets In or Out	(Total Packets and Packets In) or (Total Packets and Packets Out)
Volume - Discards and Discards Packets In / Out	(Volume - Discards Packets and Discards Packets In) or (Volume - Discards Packets and Discards Packets Out)

:

MPLS LSR Interface Report

The MPLS LSR Interface report helps you monitor and perform in-depth trend analysis for the traffic passing through the selected LSR interface or a set of interfaces.

The iSPI for MPLS uses the iSPI Performance for Metrics template reports to present the MPLS reports. The available template reports are:

- Calendar Report
- Heat Chart Report
- Chart Detail Report
- Most Changed Report
- Top N Report
- Managed Inventory

Use the MPLS LSR Interface report for the following:

- Monitor the LSR interface or interfaces for packets and data bytes utilization in the network.

- Compare the incoming and outgoing traffic (packets, labels, and packet discards) for the selected LSR interface over a period of time.

- Investigate and troubleshoot the interfaces with the high exception counts (packets discarded and excessive utilization). For example, you can investigate if the packet discards exceed the threshold

value for the selected node or if the volume of the packets passing through the selected node is more than the threshold value.)

- Monitor the interfaces by traffic volume.

Related Topics:

MPLS LSR Interface Report Metrics and Topology Filters

-

MPLS LSR Interface Calendar Report

The MPLS LSR Interface Calendar report enables to monitor the traffic passing through the selected interfaces for a specific time range.

Use this report to perform the following tasks:

- Monitor and compare the traffic performance for an interface or interfaces over a period of time.
- Identify a specific time period to find out any unusual behavior in the traffic passing through the interface.

Report Options

The LSR Interface Calendar report shows the following options:

- Primary Metrics[1]
- Secondary metrics[2]

For information about metric definitions, see MPLS LSR Interface Metrics Definitions.

For more information on how to use the report, see Using the MPLS LSR Calendar Report.

---

[1]Select the metric based on which you want to generate the report. The primary metric appears on the left Y axis of the report.
[2]Select the secondary metrics to compare your report. The secondary metrics appears on the right Y axis of the report.

Using the iSPI for MPLS LSR Calendar Report

The following example demonstrates the use of a Calendar Report:

Find the total number of incoming and outgoing octets passing through the selected TE Tunnel Head.

Check the MPLS LSR Node Calendar report to analyze the traffic passing through a TE Tunnel head configured on a node. If the outgoing bytes are less than the incoming bytes, may result in slow traffic.

To view the report, follow these steps:

1. Navigate to the HP NNMi iSPI Performance for Metrics Software console.[1]

2. Click the **MPLS_LSR_Node** tab or the **MPLS_LSR_Interface** tab.

3. Select one of the following time ranges for the Calendar report:

   - **Daily(D)** for the report showing information for past one day

   - **Weekly(W)** for the report showing information for past seven days

   - **Monthly(M)** for the report showing information for past 30 days

   In this case, we select **W**. For example, the Calendar report shows three time range options such as Daily (displayed as **D**), Weekly (displayed as W), and Monthly (displayed as **M**).

4. Click **Topology Filters** and select **TE Tunnel Head**.

5. Click **Options**and select the following metrics:

   - **Octets In (sum)** as the primary metric.

   - **Octets Out (sum)** as the secondary metric.

6. Select **Confirm Selection**.

The MPLS LSR Node Calendar report opens. The following sample report shows a weekly comparative report for the selected interface.

Note: This example is for the MPLS_LSR_Node Calendar Report. Similarly, to view the MPLS _LSR_Inteface Calendar report, select the metrics from the MPLS_LSR_Interface tab.

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[1]From the NNMi console, click **Actions->Reporting-Report Menu**

Heat Chart Report

The MPLS LSR Interface Heat Chart report helps you to view the traffic performance based on a single metric over a time frame.

The heat chart shows different colors to display the different states of a metric. These states show traffic performance for the selected network element. For example, select a weekly Heat Chart report to find the performance of a metric **(Octets In (sum)** for the selected network element **(Interface Name)**.

Use this report to perform the following tasks:

- Track the hourly performance of the traffic passing through an interface.

- Quickly isolate and resolve problems affecting the selected time range by the different colors.

Report Options

The Heat Chart report shows the following option:

Metric[1]

For information about metric definitions, see MPLS LSR Interface Metric.

For more information about how to use report, see Using the MPLS LSR Heat Chart Report.

Using the iSPI for MPLS LSR Heat Chart Report

The following example demonstrates the use of a Heat Chart Report:

Check the MPLS LSR Interface Heat report to find the total number of incoming discards packets for the selected qualified interface.

To view the Heat Chart report, follow the steps:

1. Navigate to the HP NNM iSPI Performance for Metrics Software console.[2]

2. Click the **MPLS_LSR_Interface** tab or the **MPLS_LSR_Node** tab.

3. Select one of the time ranges for the heat report. For example, select **D**

4. Click **Topology Filters** and select **Qualified Interface Name**

---

[1]Select the metric based for which you want to open the report.
[2]From the NNMi console, click **Actions**->**Reporting-Report Menu**

5. Click **Options** and select **Packets Discard In (sum)**.

6. Select **Confirm Selection.**

The MPLS LSR Interface Heat Chart report opens. The following sample report displays the different states of Packets Discard In (sum) for the selected qualified interface.

Note: This example is for MPLS_LSR_Interface Heat Chart Report. Similarly, to view the MPLS _LSR_ Node Heat Chart report, select the metrics from the MPLS_LSR_Node tab.

MPLS LSR Interface Chart Detail Report

The MPLS LSR Interface Chart Detail report helps you compare the sampled data for any two metrics. For example, select a weekly Chart Detail report to compare the incoming and outgoing packets from the selected interface.

Use this report to perform the following tasks:

- Analyze the trend of traffic passing though an interface or interfaces based on one unit of time. Each unit of time is known as a **Display Grain**. Make sure to set the display grain greater than the polling interval to view the correct report. You can measure the **Display Grain** as follows:

  - Five minutes for hourly report

  - One hour for daily report

  - One day for weekly report

  - One day for monthly report

- Compare the metrics for the selected network element over a period of time.

- Detect any persistent problem in the network.

Report Options

The Chart Detail report shows the following options:

- Primary Metrics [1]
- Secondary metrics[2]

For information about metric definitions, see MPLS LSR Interface Metrics.

For more information about how to use the report, see Using the MPLS LSR Interface Chart Detail Report.

Using the iSPI for MPLS LSR Chart Detail Report

The following example demonstrates the use of a Chart Detail Report:

Find the total number of incoming and outgoing discarded packets for the selected interface.

To view the Chart Detail report, follow these steps:

---

[1]Select the main metric based on which you want to open the report. The primary metric appears on the left Y axis of the report.
[2]Select the secondary metrics to compare your report. The secondary metrics appears on the right Y axis of the report.

1. Navigate to the HP NNM iSPI Performance for Metrics Software console.[1]

2. Click the **MPLS_LSR_Interface** tab or **MPLS_LSR_Node** tab.

3. Click **Topology Filters** and select **Qualified Interface Name**.

4. Click **Options** and select the following metrics:

   - **Packets Discard In (avg)** as the primary metric.

   - **Packets Discard Out (avg)** as the secondary metric.

5. Select **Confirm Selection**.

The MPLS LSR Interface Chart Detail report appears.

The Chart Detail report shows the following:

- X axis: Time Interval

- Y axis: Packets Discard In (avg) and Packets Discard Out (avg)

View if there is any significant increase or drop in the number of discard packets received or sent by the interface for the specific time interval. Check the iSPI for MPLS Inventory views for the incidents and status of the interface.

This report helps you in capacity management to view if the interface utilization is more than the expected traffic, you can route MPLS traffic from another interface.

Note: This example is for MPLS_LSR_Interface Chart Detail Report. Similarly, to view the MPLS _LSR_ Node Chart Detail report, select the metrics from the MPLS_LSR_Node tab.

MPLS LSR Interface Most Changed Report

The MPLS LSR Interface Most Changed report helps you to helps you to compare one metric for two different (consecutive) time frames. In addition, you can find the changes and growth percentage in the metric value for an interface or interfaces. For example, select a weekly Most Changed report to compare a metric **(Octets In (avg))** that is grouped by a network element **(Interface Name)**

Use this report to perform the following tasks:

- Monitor the change in the traffic performance for a node or nodes based on a metric value.

- Find out the change and growth rate of the traffic based on a single metric.

Report Options

The Most Changed report shows the following option:

- Top N[2]

- Metric[3]

- Grouping By[4]

---

[1]From the NNMi console, click **Actions**->**Reporting-Report Menu**
[2]Select the type of report from the available rank-list. The rank-list includes top or bottom 5,10, 25 ranks for the selected network element. The ranks are available either in ascending order or descending order.
[3]Select the metric based on which you want to view the report.
[4]Select the option available to group the metric.

For information about metric definitions, see MPLS LSR Node Metrics.

For more information about how to use the report, see Using the MPLS LSR Interface Most Changed Report.

Using the iSPI for MPLS Most Changed Report

The following example demonstrates the use of a Most Changed Report:

Check the MPLS Most Changed report to find the incoming packets discards for the current and previous selected time period.

To view the MPLS Most Changed report, follow these steps:

1. Navigate to the HP NNM iSPI Performance for Metrics Software console.[1]

2. Click the **MPLS LSR Interface** tab or **MPLS_LSR_Node** tab.

3. Select one of the time ranges available for the Most Changed Report. In this case, we select **W**.

4. Click **Topology Filters** and select **Node Name**.

5. Click **Options** and select the following metrics:

   ▪ **Packets Discards In** (avg) as the primary metric.

   ▪ **Qualified Interface Name** as the Grouping by metric.

6. Select **Confirm Selection**.

The MPLS LSR Most Changed report appears. The sample report shows a weekly comparative study to find out the change in the metric value for current and pervious time range.

Note: This example is for MPLS_LSR_Interface Most Changed Report. Similarly, to view the MPLS _LSR_ Node Most Changed report, select the metrics from the MPLS_LSR_Node tab.

---

[1]From the NNMi console, click **Actions**->**Reporting-Report Menu**

MPLS LSR Interface Top N Report

The MPLS LSR Interface Top N report ranks the MPLS-enabled interfaces by the traffic volume. The report is based on a single metric and grouped by one or more network element. The Top N report lists the network elements in the descending order; that is from the highest value of the selected metric to the lowest value of the selected metric. For example, select a daily Top l0 report to view the top 10 MPLS-enabled interfaces with a metric.

The Top N list includes the following:

- Top / Bottom 5 - Shows the Top / Bottom 5 horizontal bar graphs that provide values in descending or ascending order based on the selected metric.

- Top / Bottom 10 - Shows the Top / Bottom 10 horizontal bar graphs that provide values in descending or ascending order based on the selected metric.

- Top / Bottom 25 - Shows the Top / Bottom 25 horizontal bar graphs that provide values in descending or ascending order based on the selected metric. This helps to monitor traffic passing through the critical interfaces.

- Top / Bottom 50 - Shows the Top / Bottom 50 horizontal bar graphs that provide values in descending or ascending order based on the selected metric. This helps to monitor traffic passing through the critical interfaces.

- Top / Bottom 100 - Shows the Top / Bottom 100 horizontal bar graphs that provide values in descending or ascending order based on the selected metric. This helps to monitor traffic passing through the critical interfaces.

Use this report to perform the following tasks:

- Analyze the ranks available for the network element based on the selected metric values.

- Investigate and troubleshoot the interfaces with the high exception counts (packets discarded and excessive utilization).

- Monitor the critical and important LSR nodes and interfaces.

- Compare the graph with the displayed values for a quick overview of the network.

- Compare the network element with the selected metric values for a quick overview of the network. You can find the cause of network performance by using the drill-down reports.

Report Options

The Top N report shows the following options:

- Top N [1]

- Metric [2]

---

[1]Select the type of report from the available rank-list. The rank-list includes top or bottom 5,10, 25, 50, 100 ranks for the selected network element. The ranks are available either in ascending order or descending order.
[2]Select the main metric based on which you want to view the report. The primary metric appears on the left Y axis of the report.

- Display Time Series Chart[1]

- Grouping By[2]

For information about metric definitions, see MPLS LSR Interface Metrics.

For more information about how to use the report, see Using the MPLS LSR Interface Top N Report.

Using the iSPI for MPLS Top N Report

The following example demonstrates the use of a Top N Report:

Check the MPLS LSR Node Top N report to find the labels passing through the MPLS-enabled nodes located in XYZ region in the network. In addition, rank the LSR nodes by an order of the selected metric in the network.

To view the Top N report, follow the steps:

1. Navigate to the HP NNM iSPI Performance for Metrics Software console.[3]

2. Click the**MPLS LSR Node** tab.

3. Select one of the time ranges available for the Top N Report. In this case, we select **W**.

4. Click Topology Filters and select NodeGroup Name. (For example, Routers or Switches).

4. Click **Topology Filters** and select **NodeGroup Name.**

5. Click **Options** and select the following metrics:

   - **Incoming labels (avg)** as the primary metric.

   - **Node Vendor and Node Location** as the Grouping by metric.

6. Select **Confirm Selection**.

The Top N report appears that shows the ranking and percentage of all the NodeGroups (selected topology filter) in the network that are grouped by Node Vendor and Node Location.

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[1]Select Yes to view the detail chart with the table. Select No to hide the chart and show only the graph. The Top N report shows the Time Series Chart.
[2]Select one or more network element from the available options.
[3]From the NNMi console, click **Actions**->**Reporting-Report Menu.**

Use the MPLS LSR Node Top N report to find the reason and cause of the drop in the incoming and outgoing labels of the selected node.

1. Navigate to the MPLS LSR Node Top N Report.

2. Click the Node that shows the low incoming labels. Select the type of template report as per your interest. For example, select the Chart Details report. Select the primary metric as Incoming labels (avg) and the secondary metric as Outgoing labels (avg). The Chart Details report appears.

The MPLS LSR Node Chart Detail report shows the following:

- X axis: Time Interval

- Y axis: Incoming Labels Used (avg) and Outgoing Labels Used (avg)

View the significant drop or rise in the graph. Check the iSPI for MPLS Inventory views to view the incidents and status of the selected node.

Note: This example is for MPLS_LSR_Node Top N Report. Similarly, to view the MPLS _LSR_Interface Top N report, select the metrics from the MPLS_LSR_Interface tab.

MPLS LSR Interface Report Metrics

The following **Metrics** are available with the MPLS LSR Interface report:

Metric

Name	Description
Incoming Labels Used (average) (maximum) (minimum)	The number of labels received by the selected node.
Outgoing Labels Used (average) (maximum) (minimum)	The number of the labels sent out by the selected node.
Octets In (sum)	Total number of incoming bytes passing through the selected node.
Octets Out (sum)	Total number of outgoing bytes passing through the selected node.
Volume Octets (sum)	Total number of bytes passing through the selected node.
Packets In (sum)	Total number of packets received by the selected node.
Packets Out (sum)	Total number of packets sent out from the selected node.
Total Packets (sum)	Total number of packets passing through the selected node.

Name	Description
Discards Packets In (sum)	The number of packets reaching late or not reaching the destination. These packets pass through the selected node.
Discards Packets Out (sum)	The number of outgoing packets sent out late or not reaching the destination.These packets or bytes pass through the selected node.
Volume - Discards Packets (sum)	Total number of packets that are in the discarded state.

To view some useful reports, compare the following relevant metric:

Attributes

Metrics	Comparison Chart
Labels	Labels In and Labels Out
Packets	Packets In and Packets Out
Discards	Discards In and Discards Out
Volume and Labels	(Volume (sum) and Incoming Labels used) or (Volume (sum) or Outgoing Labels used)
Total Packets and Packets In or Out	(Total Packets and Packets In) or (Total Packets and Packets Out)
Volume - Discards and Discards Packets In / Out	(Volume - Discards Packets and Discards Packets In) or (Volume - Discards Packets and Discards Packets Out)

The following **Grouping By** options are available with the MPLS LSR Interface report:

Attributes

Name	Description
NodeGroup Name	The name of the node group. To enable the polling for the selected node group, see *Help for NNMi, Node Group Settings (NNM iSPI Performance).*
InterfaceGroup Name	The name of the selected interface group. To enable the polling for the selected interface group, see *Help for NNMi, Interface Group Settings (NNM iSPI Performance).*
Interface UUID	The Universally Unique Identifier of the selected interface.
Interface Name	The name of an interface on the node.
Qualified Interface Name	The name of the selected interface on the MPLS-enabled node.

[1]ODBID is a custom attribute that the HP Network Node Manager i Software uses to integrate the NNMi topology with Business Service Management(BSM) software suite.
[1]ODBID is a custom attribute that the HP Network Node Manager i Software uses to integrate the NNMi topology with Business Service Management(BSM) software suite.

Name	Description
Interface Type	The kind of an interface.
Node UUID	The Universally Unique Identifier of the selected MPLS-enabled node.
Node Location	The place where the node is configured.
Node Contact	The node details as per the router configuration.
Node Family	The type of family of a node.
Node Vendor	The type of a node. Example, Cisco or Juniper node.
Node ODBID[1]	The key value of the selected node.
Interface ODBID [1]	The key value of the selected interface.

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[1]ODBID is a custom attribute that the HP Network Node Manager i Software uses to integrate the NNMi topology with Business Service Management(BSM) software suite.
[1]ODBID is a custom attribute that the HP Network Node Manager i Software uses to integrate the NNMi topology with Business Service Management(BSM) software suite.

L3_VPN_VRF Report

The L3_VPN_VRF report provides the statistics based on the metric value for the VRFs and L3VPNs in the network. Monitor the status of large-scale enterprise L3VPNs running over MPLS-enabled networks by using MPLS reports.

The iSPI for MPLS uses the template reports to show the MPLS reports. The available template reports are:

- Calendar Report
- Heat Chart Report
- Chart Detail Report
- Most Changed Report
- Top N Report
- Managed Inventory

Use the L3 VPN VRF report to perform the following tasks:

- Monitor the VRFs and L3 VPNs for the available metric values. You can use the drill-down reports to help you conclude the issue faster.

- Rank the VRFs and L3 VPNs based on a metric value.

- Investigate and troubleshoot the VRFs or L3 VPNs with the high exception counts. For example, if you select a VRF that is not available for a long duration, you can find the reason by using L3_VPN_VRF Top N report.

- Compare the available percentage, down time, and repair time for a VRF or an L3 VPN.

- Navigate from NNMi Interface health report to L3_VPN_VRF report to view the traffic performance. From the NNMi Interface inventory, start the NNMi interface health extension pack. The extension pack appears with the MPLS network elements such as MPLS_L3VPN Name and MPLS_VRF Name. You can navigate to the L3_VPN_VRF report to generate the report with MPLS metric values such as discards- packets (sum).

L3_VPN_VRF Calendar Report

The iSPI for MPLS L3_VPN_VRF Calendar report enables you to monitor the selected VRFs for a specific time range. In addition, the report shows a comparative study of the selected metrics for a specific time range.

Use this report for the following:

- Monitor and compare the performance of the metric value for a VRF or VRFs.

- Identify a specific time period when the selected metric value exceeds the threshold value for a VRF or L3VPN.

Report Options

The Calendar report shows the following options:

- Primary Metrics[1]

- Secondary metrics[2]

For information about metric definitions, see L3_VPN_VRF Metric Definitions.

For more information about using L3_VPN_VRF Calendar report, see Using the L3_VPN_VRF Calendar Report.

Using the L3_VPN__VRF Calendar Report

The following example demonstrates the use of a Calendar Report:

An L3 VPN service is affected as the status of the VRF is down very frequently.

To find out the reason for the performance of the selected VRF, compare the mean time to recovery and mean time between failures.

To view the Calendar report, follow the steps:

1. Navigate to the HP NNM iSPI Performance for Metrics Software console.[3]

2. Click the **L3_VPN_VRF** tab.

3. Select one of the following time ranges for the Calendar Report:

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[1]Select the metric based on which you want to generate the report. The primary metric appears on the left Y axis of the report.
[2]Select the secondary metrics to compare your report. The secondary metric appears on the right Y axis of the report.
[3]From the NNMi console, click **Actions->Reporting-Report Menu**

- **Daily(D)** for the report showing information for past one day

- **Weekly(W)** for the report showing information for past seven days

- **Monthly(M)** for the report showing information for past 30 days

   In this case, we select **W**. For example, the Calendar reports display three time range options such as Daily (displayed as **D**), Weekly (displayed as W), and Monthly (displayed as **M**).

4. Click **Topology Filters** and select **VRF Name**.

5. Click **Options** and select the following metrics:

   - **Mean Time To Recovery (avg)** as the primary metric.

   - **Mean Time Between Failures (avg)** as the secondary metric.

6. Select **Confirm Selection**.

The Calendar Report opens. The following sample report displays a weekly comparative report for the selected VRF. If the MTTR is more than the expected value, the performance of the selected VRF is low.

L3_VPN_VRF Heat Chart Report

The L3_VPN_VRF Heat Chart report helps you to view the traffic performance based on a single metric over a period of time range. The heat chart shows different colors to display the different states of a metric. These states show traffic performance for the selected network element. For example, select a weekly Heat Chart report to find the performance of a metric **(availabilitypct (avg)** for the selected network element **(VRF Name)**.

Use this report to perform the following tasks:

- Track the hourly performance of the traffic passing through a VRF or an L3VPN.

- Quickly isolate and resolve problems affecting in the selected time range by the different colors.

Report Options

The Heat Chart report shows the following option:

Metric[1]

For information about metric definition, see L3_VPN_VRF Metric Definitions.

For more information about how to use the report, see Using the L3_VPN_ VRF Heat Chart Report.

---

[1]Select the metric based on which you want to view the report.

Using the L3_VPN _VRF Heat Chart Report

The following example demonstrates the use of a Heat Chart Report:

Track the availability of the VRF or L3VPN on an hourly basis.

To view the report, follow these steps:

1. Navigate to the HP NNM iSPI Performance for Metrics Software console.[1]

2. Click the **L3_VPN_VRF** tab.

3. Select the time range for the report. For example, select **W**.

4. Click**Topology Filter**and select **VRF Name**.

5. Click **Options** and select **AvailabilityPct (avg)**.

6. Select **Confirm Selection.**

The Heat Chart report opens. The sample report shows the different states of a metric for the selected VRF.

L3_VPN_VRF Chart Detail Report

The L3_VPN_VRF Chart Detail report helps you compare the sampled data for any two metrics. For example, select a weekly Chart Detail report to compare the mean time to recovery and mean time between failures for the selected VRF.

Use this report to perform the following tasks:

- Analyze the availability of the VRFs or L3VPNs based on one unit of time. Each unit of time is called as a **Display Grain**. Make sure to set the display grain greater than the polling interval to view the correct report. You can measure the **Display Grain** as follows:

  - Five minutes for hourly report

  - One hour for daily report

  - One day for weekly report

  - One day for monthly report

- Compare the metrics for the selected network element over a period of time.

- Detect any persistent problem in the network.

Report Options

The Chart Detail report shows the following options:

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[1]From the NNMi console, click **Actions**->**Reporting-Report Menu**

- Primary Metrics [1]
- Secondary Metrics[2]

For information about L3_VPN_VRF metric definitions, see L3_VPN_VRF Metric Definitions.

For more information about L3_VPN_VRF Chart Detail Report, see Using the L3_VPN_ VRF Chart Detail Report.

Using the L3_VPN_VRF Chart Detail Report

The following example demonstrates the use of a Chart Detail Report:

Compare the availability percentage and Mean Time To Recovery (MTTR) for the selected VRF.

To view the report, follow the steps:

1. Navigate to the HP NNM iSPI Performance for Metrics Software console.[3]

2. Click the **L3_VPN_VRF** tab.

3. Click **Topology Filters** and select **VRF Name**.

4. Click **Options** and select the following metrics:

   - **AvailabilityPct (avg)** as the primary metric.

   - **Mean Time To Recovery (avg)** as the secondary metric.

5. Select **Confirm Selection**.

The L3 VPN VRF Chart Detail report shows:

- X axis: Time Interval

- Y axis: AvailabilityPct (sec) (avg) and Mean Time To Recovery (sec) (avg)

The report helps you to compare the selected metrics for the selected VRF.

Most Changed Report

The L3_VPN_VRF Most Changed report helps you to compare one metric over a time frame. In addition, you can find out the growth percentage of the network element based on the selected metric.

Use this report to perform the following tasks:

- Monitor the change in the available time, repair or down time of the selected VRF or L3VPNs.

- Find out the change and growth percentage of the selected VRF or L3VPN based on a single metric.

Report Options

---

[1]Select the main metric based on which you want to generate the report. The primary metric appears on the left Y axis of the report.
[2]Select the metric to compare with the primary metric. The secondary metric appears on the right Y axis of the report.
[3]From the NNMi console, click **Actions**->**Reporting-Report Menu**

The Most Changed report shows the following option:

- Top N[1]
- Metric[2]
- Grouping By[3]

For information about metric definitions, see L3_VPN_VRF Metric Definitions.

For more information about the report, see Using the MPLS L3_VPN _VRF Most Changed Report

MPLS VRF report provides the near real-time reports for the VRF availability on the MPLS - enabled node that help you to monitor and perform trend analysis for the traffic passing through the selected LSR node.

The iSPI for MPLS uses the Performance SPI console and MPLS metrics to generate the MPLS_L3VPN_ VRF report.

Use the MPLS L3 VPN VRF report for the following:

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[1]Select the type of report from the available rank-list. The rank-list includes top or bottom 5,10, 25 ranks for the selected network element. The ranks are available either in ascending order or descending order.
[2]Select the metric based on which you want to view the report.
[3]Select an option to group the report data. You can select more than one option.

- Monitor the VRF available time in the network.

- Monitor the L3 VPN available time in the network.

- Compare the VRF and L3 VPN available percentage, down time, and repair time.

Launching the MPLS_L3VPN_VRF Report

After you install the iSPI for MPLS extension-pack, you can view the MPLS reports from the Perf SPI console. To view the MPLS report, select the attributes from Topology Filter, Report Options, and Time Controls. Make sure that NPS and Perf SPI metrics is running when you start the iSPI for IP MPLS reports.

To launch the MPLS_L3VPN_VRF report, follow the steps:

1. Navigate to the Perf SPI console.

2. From the **Perf SPI console**, click the **MPLS_L3VPN_VRF** tab.

3. Select the type of Perf SPI metrics report such as Top N, Most Changed and so on. If you select Top N report, then select any one type of Top N report such as Hourly, Daily, Weekly, or Monthly.

4. From the **Report Options**, select any one **Metric** and **Grouping by** attribute and click **Confirm** Selection. The MPLS_L3VPN_VRF report appears. For Metrics and Grouping by attributes, see Report Options available for the MPLS report.

MPLS_L3VPN_VRF Report Options

The following **Metrics** are available with the MPLS_L3VPN_VRF report:

Metric

Name	Description
AvailabilityPct (avg, max, min)	Total duration for which the status of the selected VRF participating in the L3 VPN is up and active..
Time Between Failures(avg, max, min)	Average time for the selected VRF to change the state from Up to Down. Units is seconds. For example, if the status of the selected VRF at 10:00 AM is Up and the status changes to Down at 10:20 AM. Again, the status of the VRF changes from Down to Up at 10:30 AM till 10:40 AM. Therefore, the Time Between Failures is the total time when the selected VRF changes the state from Up to Down by the total number of occurrences of the status change.
Time To Repair (avg, max, min)	Average time taken to repair or restore the status of the selected VRF from Down to Up. Units is seconds.

To perform the trend analysis and to generate some useful reports, compare the following relevant metrics for the following template reports:

Attributes

Primary	Secondary
AvailabilityPct (avg, max, min)	Ttime Between Failures(avg, max, min)
AvailabilityPct (avg, max, min)	Time To Repair (avg, max, min)
Ttime Between Failures(avg, max, min)	Time To Repair (avg, max, min)

Primary	Secondary

The following **Grouping By** options are available with the MPLS reports.

Attributes

Name	Description
VRF Name	The name of the VRF.
L3 VPN Name	The system - assigned or user - given name of the L3 VPN.

Using the iSPI for MPLS Most Changed Report

The following example demonstrates the use of a Most Changed Report:

 Find out the total available percentage for the VRFs participating in the network.

Check the MPLS Most Changed report to find the available VRFs for the current and previous selected time period.

To view the Most Changed report, follow the steps:

1. Navigate to the HP NNM iSPI Performance for Metrics Software console.[1]

2. Click the **L3_VPN_VRF**tab.

3. Select one of the time ranges available for the Most Changed Report. In this case, we select **D**.

4. Click **Topology Filters** and select **MPLS L3VPN Name**. This filter is optional. If you do not select any filter, the report appears with all the available filters in the topology.

5. Click **Options** and select the following metrics:

   - **AvailabilityPct**as the primary metric.

   - **MPLS VRF Name** as the Grouping by metric.

6. Select **Confirm Selection**.

The Most Changed report opens. The following sample report shows a weekly comparative study. You can find out the change and growth rate in the metric value for the specific time range.

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[1]From the NNMi console, click **Actions**->**Reporting-Report Menu**
[2]The time when the traffic is passing through a VRF or an L3VPN.

L3_VPN_VRF Top N Report

The L3_VPN_VRF Top N report ranks the VRF or L3VPN for the available time[1] . The report is based on a single metric and grouped by one or more network element. The Top N report lists the network elements in the descending order; that is from the highest value of the selected metric to the lowest value of the selected metric. For example, if you select a daily Top l0 report, you can see statistics of the VRFs based on the metric value.

The Top N list includes the following:

- Top / Bottom 5 - Shows the Top / Bottom 5 horizontal bar graphs that provide values in descending or ascending order based on the selected metric.

- Top / Bottom 10 - Shows the Top / Bottom 10 horizontal bar graphs that provide values in descending or ascending order based on the selected metric.

- Top / Bottom 25 - Shows the Top / Bottom 25 horizontal bar graphs that provide values in descending or ascending order based on the selected metric. This helps to monitor traffic passing through the critical nodes.

- Top / Bottom 50 - Shows the Top / Bottom 50 horizontal bar graphs that provide values in descending or ascending order based on the selected metric. This helps to monitor traffic passing through the critical nodes.

- Top / Bottom 100 - Shows the Top / Bottom 100 horizontal bar graphs that provide values in descending or ascending order based on the selected metric. This helps to monitor traffic passing through the critical nodes.

Use this report to perform the following tasks:

- Analyze the available ranks of the network elements based on a metric.

- Monitor the critical and important L3VPNs and VRFs.

- Compare the network element with the selected metric values for a quick overview of the network. You can find the cause of network performance by using the drill-down reports.

Report Options

The Top N report shows the following options:

- Top N [2]

- Metric [3]

- Display Time Series Chart[4]

- Grouping By[5]

For information about metrics, see L3_VPN_VRF Metric Definitions.

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[1]The time when the traffic is passing through a VRF or an L3VPN.
[2]Select the type of report from the available rank-list. The rank-list includes top or bottom 5,10, 25, 50, 100 ranks for the selected network element. The ranks are available either in ascending order or descending order.
[3]Select the main metric based on which you want to view the report. The primary metric appears on the left Y axis of the report.
[4]Select Yes to view the detail chart with the table. Select No to hide the chart and show only the graph. The Top N report shows the Time Series Chart.
[5]Select one or more network element from the available options.

For more information about how to use the report, see Using L3 VPN VRF Top N Report.

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Using the L3_VPN_VRF Top N Report

The following example demonstrates the use of a Top N Report:

Check the L3_VPN_VRF report to find the availability percentage of the VRFs participating to form an L3VPN in the network.

To view the availability report for all the available VPNs, follow the steps:

1. Navigate to the HP NNM iSPI Performance for Metrics Software console.[1]

2. Click the **L3_VPN_VRF**tab.

3. Select one of the time ranges available for the Top N Report. In this case, we select **W**.

4. Click **Topology Filters**and select an **MPLS L3VPN**. For example, XYZ VPN. There are six VRFs participating in this XYZ VPN.

5. Click **Options** and select the following metrics:

   ■ **AvailabilityPct (avg)** as the primary metric.

   ■ **VRF Name** as the Grouping by metric.

6. Select **Confirm Selection**.

The L3 VPN VRF Top N report opens.

The availability percentage of the selected VRF is low. Find the cause of the drop in the availability percentage.

To view the drill-down report, follow the steps:

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[1]From the NNMi console, click **Actions**->**Reporting-Report Menu.**

1. Navigate to the L3_VPN_VRF Top N report. Select the Bottom 5 report.

2. Click the VRF that shows the lowest AvailabilityPct percentage.

3. Select the type of template report as per your interest. For example, select the Chart Detail report. Select the primary metric as Mean Time Between Failures (MTBF) (sec) (avg) and the secondary metric as Mean Time To Recovery (MTTR) (sec) (avg).

The L3 VPN VRF Chart Detail report shows:

- X axis: Time Interval

- Y axis: Mean Time Between Failures (sec) (avg) and Mean Time To Recovery (sec) (avg)

View the significant rise or drop in MTBF value for the selected VRF. Check the iSPI for MPLS Inventory views for the incidents and status of the selected VRF. This report helps you to compare the time between failures and time between for the selected VRF.

L3_VPN_VRF Report Metrics and Topology Filters

The following **Metrics** are available with the L3_VPN_VRF report:

Metric

Name	Description
AvailabilityPct (average, maximum, minimum)	Total duration for which the status of the selected VRF participating in the L3VPN is up and active.
Mean Time Between Failures (MTBF) (average, max, min)	Total time for which the selected VRF was last available by the total number of occurrences when the status of the VRF was down.
Mean Time To Recovery (MTTR) (average, max, min)	Total time taken to restore the status of the selected VRF from Down to Up by the total number of occurrences when the status was Down to Up. Unit is seconds.
VRF UUID (count-distinct)	The Universally Unique Identifier of the VRF.
MPLS VRF Name	The name of the VRF.
MPLS L3VPN Name	The name of the L3VPN.
Node Name	The name of the node.

To perform the trend analysis and to generate some useful reports, compare the following relevant metrics for the following reports:

Attributes

Primary	Secondary
AvailabilityPct (avg, max, min)	Time Between Failures (avg, max, min)
AvailabilityPct (avg, max, min)	Time To Recovery (avg, max, min)
Mean Time Between Failures (avg, max, min)	Mean Time To Recovery (avg, max, min)

The following Topology Filters are available to generate customized reports:

Topology Filters

Filters	Description
VRF UUID (count-distinct)	The Universally Unique Identifier of the VRF.
VRF Name	The name of the VRF.
L3VPN Name	The name of the L3VPN.
Node Name	The name of the node.

The following **Grouping By** options are available in the L3_VPN_VRF reports.

Attributes

Name	Description
VRF Name	The name of the VRF.
L3 VPN Name	The system-generated name of the L3 VPN.

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Appendix A: Glossary Terms

M

My Term
My definition

Appendix B: Index