HP Network Node Manager iSPI Performance for Metrics Software

For the Windows® and Linux operating systems

Software Version: 9.20

Online Help

Document Release Date: May 2012

Software Release Date: May 2012

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Contents

Introduction to the HP NNM iSPI Performance Products and the Network Performance Server

The Network Performance Server (NPS) extends NNMi's functionality by providing a platform for performance data storage, analysis and reporting. The NPS platform is used by the NNM iSPI Performance series of products, which includes NNM iSPI Performance for Metrics, Traffic, and Quality Assurance.

Through NPS, the iSPI Performance products provide a comprehensive set of customizable reports and graphs that support interactive/operational performance management and scheduled reporting. The reports and graphs provide actionable insight into the performance of the network.

At the core of the foundation provided by NPS is the column-based database management system (DBMS), which enables you to effectively store, access, and track network performance data.

Extension Packs provided by the NNM iSPI Performance products add rules and definitions to the NPS deployment to generate reports. These rules and definitions enable the business intelligence component—the BI Server—to generate insightful and actionable reports.

NPS Administration

NPS uses NNMi for all user authentication and logon via Single Sign-On. NNMi users automatically become NPS users the first time they access the NPS Report Menu.

NNMi user roles are applied in NPS. An NNMi administrator is automatically granted administrative privileges on NPS. These privileges include the ability to administer and manipulate content and settings on the BI server.

HP does not recommend that NPS users make any changes to any settings on the BI Server because changes can disrupt the functionality and performance and render the BI Server unsupportable. The user must become familiar with the BI Server and accept responsibility for the outcome if BI Server settings are modified. The BI Server documents and tutorials are shipped and installed with NPS, and can be accessed from the BI Portal.

OEM license restrictions stipulate that only one Admin can log in to the BI Server at any one time.

Console Features

The iSPI Performance interface consists of a navigation panel and a workspace.

Navigation Panel

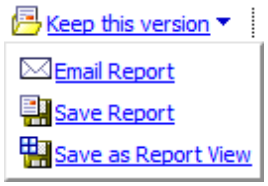
The navigation panel provides a series of tabs that enable you to create reports. To open a tab, click the down arrow. Clicking another tab automatically closes the previously used tab. The following tabs are provided.

Tab	Description
	Tracks your current selection and actions. This tab remains open.
	Options are: • Open separately • Enable drillthroughs Topology group tracking method • SCD Type 1 • SCD Type 2
	Enables you to set timing, topology, and other options prior to running a report. Selections are: • Quicklaunch ReportViews: ▪ Availability & Response for Nodes ▪ Capacity Planing on Node CPU% ▪ Executive for Interfaces ▪ Headline for Interfaces ▪ Headline for Nodes ▪ Most Changed Exceptions for Nodes ▪ Overview for Nodes ▪ Overview for Nodes - Business Hrs ▪ Response Baseline Sleeve for Nodes ▪ Throughput Calendar for Interfaces ▪ Throughput Heat Chart for Interfaces ▪ Top Interface Util% ▪ Top Interface Util% Chart ▪ Top Node CPU% ▪ Top Node CPU% Chart • iSPI Metrics:

Tab	Description
	▪ AtmPvc_Health (if this Extension Pack is installed) ▪ Component_Health (if this Extension Pack is installed) ▪ FrameRelayPvc_Health (if this Extension Pack is installed) ▪ Interface_Health (if this Extension Pack is installed) • Self Monitoring (admin users only): ▪ Quicklaunch Diagnostic Reports ▪ PerfSPI_Diagnostics • User Groups: ▪ admin ▪ globalops ▪ guest ▪ level1 ▪ level2 • All_ExtensionPacks • My Folders
	Lists the reports that have run. To clear the list, click the Clear button.
	Lists the filters that have been used. To clear the list, click the Clear button. To select new filters, click the Launch Topology Selector button. For a list of filters, see "Set Topology Filters" (on page 55).
	Provides options you can set to create custom reports: • Data Available From / Available To • Detail • Hourly • Daily • Relative Start (with options) • Interval (with options) • Grain (with options) • TimeZone (with options)

Tab	Description
	• Auto Refresh (with options) • Hour of Day / Day of Week (with options) To change any of the selected options, click the Reset button. To accept the selected options, click the Submit button.
	Provides access to: • Public Folders • My Folders • Administrator Log On • Portal - launches the BI Portal page • Query Studio - launches the custom report feature • Administration - launches the BI Server Administration page
	Provides a direct link to the NNM console.

Workspace

Selection	Description
	The Keep this version options enable you to keep the report version that currently appears in the workspace, email it, save it as a report, or save it as a ReportView (if you are the Administrator or have permission for that option).
	Enables you to run the report selected.
	Enables you to view the report in various output formats: HTML, PDF, or Excel.
	Shows the report you selected to run; for example, the Executive report.
Run Prompts	Opens the Topology Filter dialog.
Show Bookmark / Hide Bookmark	Displays the url. Once, opened, you can close it with Hide Bookmark.

Selection	Description
Help	Opens the main page of the online help.

Location of Program and Runtime Files

NPS consists of static application software files and dynamic runtime files.

The default path for static application software is:

- Windows:

  ```
  %Program Files (x86)%\HP\HP BTO Software
  ```

- Linux:

  ```
  /opt/OV/NNMPerformanceSPI
  ```

The default path for the dynamic runtime files is:

- Windows:

  ```
  %NPSDataDir%\HP\NNMPerformanceSPI
  ```

- Linux:

  ```
  /var/opt/OV
  ```

The performance of NPS depends on the I/O performance of the disk subsystem where this directory resides. HP strongly recommends that this data location be hosted on a high-performance file system. For specifications, see the support matrix..

The NNMPerformanceSPI directory contains the following folders:

- contentstore
- database
- nnmappfailover
- L10N
- logs
- PerfSPI_Diagnostics
- rconfig
- A directory for each installed Extension Pack
- Additional directories for any Custom Collect Report Groups created on NNMi

The folders are placed by the default NPS installation. Additional folders can be present if additional Extension Packs are present.

Data Retention Defaults

The default settings are the following:

Setting	Default Value (Days)	Table
Daily Data	800	Day
Hourly Data	70	Hour
Raw/Detailed Data	14	Raw

You can modify the default settings using the Configuration utility.

Single Sign-On Security

NPS enables you to use a security function known as Single Sign-on (SSO). SSO allows NPS to recognize the same user names and passwords the NNMi console recognizes. When SSO is enabled, a user who is already logged on to NNMi can move from NNMi to a report without having to log on again.

For SSO to operate, the following conditions must be met:

- The NNM system and the NPS system must be configured with fully qualified domain names (FQDN).
- The user must use the fully qualified domain (not "localhost" or the machine name without the domain) when launching the NNMi console.

If the user launches NNMi using an unqualified host name, an error message will appear in the Current Status tab of the navigation panel.

If the address, or the domain, of the NNMi management server or the NPS system changes after you install NPS, re-run the enablement script on NNMi. Re-running the enablement script configures NNMi with updated location information.

Direct access to NPS

You can access NPS directly, without going through NNMi, by pointing your browser at:

http://<*fully-Qualified-serverName*>:9300

When the login window opens, enter the same username and password you use to launch NNMi. After you are authenticated, the NPS home page opens.

You can also use the following methods:

- From the server where NPS is installed, run launchReport.ovpl.
- *Windows only*: Use the menu item in **Start** > **All Programs** > **HP** > **NNM iSPI Performance** > **Report Menu**.

Monitor NPS Processes

NPS includes reports for admin users only to monitor NPS processes.

To view the available reports:

1. Log in to NPS.
2. On the NPS home page, click the **Reports** tab in the navigation panel.
3. Select **Self Monitoring**(admin users only) > **PerfSPI_Diagnostics** > **DiagnosticMetrics**.

Set Thresholds for Metrics in NNMi

Until you set the thresholds for the performance metrics, the reports do not track exception counts or exception rates.

NNMi does not set thresholds for performance metrics for you automatically. You must set the thresholds for the iSPI Performance metrics manually using the Thresholds Settings form in the NNMi console.

For information about how to set thresholds with the NNMi console, and for a listing of metrics, see "Configure Threshold Monitoring for Interfaces (HP Network Node Manager iSPI Performance for Metrics Software)" in the *HP Network Node Manager i Software Online Help for Administrators*.

Although you might want to see exception counts as soon as possible, you should wait until you are better acquainted with the way your network behaves. For example, if the thresholds are set wrong, NNMi might detect too many exceptions. Or, if you configure NNMi to generate incidents in response to threshold conditions, NNMi could generate too many incidents.

NNMi Baseline Settings

You can use configure NNMi and NPS for baseline monitoring in your network environment. For more information, see the "Configure Baseline Settings" topic in the *HP Network Node Manager i Software Online Help for Administrators*.

Support for NNMi Application Failover

Application Failover for NNMi ensures redundancy. Failover allows a secondary NNMi server to take over immediately after the failure of a primary NNMi server. Failover relies on jboss clustering technology, ongoing file system synchronization, and a Java keystore file that must be copied from NNM to NPS. For details, see the *HP Network Node Manager iSPI Performance for Metrics Installation Guide*.

NPS supports NNMi Application Failover, which is transparent to users. Aside from an interruption in service lasting about 15 minutes while failover is in progress, users are not aware that a failover took place, and the administrator is not required to perform any special tasks related to failover.

The ability of NPS to support Application Failover depends on files it retrieves from the primary server in the cluster. NPS retrieves these files during startup. As soon as NPS has the files, it begins monitoring the status of the primary server by checking for status changes every 5 minutes. If NPS detects a status change, the following events take place automatically:

- NPS determines which server is the new primary server.
- NPS redirects data collection to a shared directory on the new primary server.
- NPS begins collecting data (metrics and topology files) from the new primary server in the cluster.

Immediately after, NPS users are able to link from NPS to NNMi views on the new primary server, just as they could before failover.

NPS reports messages relating to failover (see "Messages Related to Failover" (on page 22)).

Messages Related to Failover

The following INFO, WARN, and ERROR log file messages pertain to Application Failover.

Condition	Message	Comments
Failover not enabled	DEBUG: NNM Application Failover is not enabled.\n	Logged every 5 minutes if DEBUG logging is enabled
Failover enabled	INFO: NNM Application Failover is enabled. Checking if active node has changed.\n	Logged every 5 minutes
Failover enabled	INFO: NNM Hostname currently used by NPS is: $nnm_current\n	Logged every 5 minutes. Displays the current NNM hostname being used by NPS.
Failover enabled	INFO: $getNNMActiveScript reports active nnm node is: $nnm_ active\n	Logged every 5 minutes. Displays the NNM hostname reported as the active node in the cluster.
Failover enabled but the active host has not changed.	INFO: Active NNM host is unchanged.\n	Logged every 5 minutes.
Failover enabled	INFO: Changing NPS configuration to use $nnm_active\n	A configuration update is imminent. This message is logged only when the active node is different from the node currently used by NPS.
Failover enabled and config files successfully updated	INFO: Configuration updated. Path to NNM is now $newpath\n	Logged after the configuration file is successfully updated in response to an Application Failover.
Failover enabled but the NNM hostname is not in the path syntax	WARN: NNM Application Failover is not supported on same-system NNM/NPS installations\n	If NPS is running on the same machine as NNN, the path does not contain the hostname.
Failover enabled but the NNM hostname is not in the path syntax	WARN: Cannot extract remote nnm hostname from value of PRSPI_NNMDIR ($cfg{PRSPI_ NNMDIR})..\n	The user might have specified the path in a non-conventional way; for example, by using a hard mount or drive mapping. If the path does not contain the remote NNM hostname, NPS is not able to detect Application Failover.

Condition	Message	Comments
Failover enabled but the NNM hostname is not in the path syntax	WARN: Expected PRSPI_NNMDIR of form /net/hostname/var... or //hostname/PerfSpi\n	The user might have specified the path in a non-conventional way; for example, by using a hard mount or drive mapping. If the path does not contain the remote NNM hostname, NPS is not able to detect Application Failover.
Failover enabled but the nnm_details.xml file is not available.	ERROR: nnm_details.xml not found in $newpath	This message is logged if there is no copy of nnm_details.xml on the remote NNM machine. This condition occurs if the `nnmenableperfspi` script was not run on that machine, because running the script creates the `nnm_details.xml` file. This condition could also occur if the machine configurations are not identical. For example, if the pathnames to the shared drive are not identical, the new path will be incorrect when NPS substitutes the new hostname into the path. The configurations **must** be identical.
Failover enabled but there is a file permissions error	ERROR: Unable to modify timestamp of $newpath/nnm_details.xml: $!.	NPS configuration will not change. A file permissions error is preventing the nnm_detail.xml file from being modified on the NNM server.
Failover enabled but unable to update the config file.	ERROR: Unable to write changes to config file. Will try again next time.\n	Failure to update the config file could be caused by another process that is locking the config file.

Back Up and Restore

NPS provides command-line tools that back up and restore all NPS data.

To back up NPS data:

1. Log in to the NPS system with the same account used to install NPS.
2. Run the following command:

```
backup.ovpl -b <dir> [-c] [-d] [-f]
```

In this instance, *<dir>* is the location where you want to place the backed-up data. Do not use `%NPSInstallDir%` or `%NPSDataDir%` with this option.

Options

- Use the `-c` option to back up the content store.
- Use the `-d` option to back up the database.
- Use the `-f` option to back up all NPS configuration and archived data files.

- Use the `-t` option to suppress creating a single compressed archive (tar.gz) file. This option leaves the directory as is on the file system, and greatly speeds up the backup process.
- Use the `-x` option to exclude the demo database from the backup. This option speeds up the backup process.

You must specify a valid directory location as an argument of the `-b` option. If you do not specify any other options, the backup script will back up the content store and the database.

The duration of the backup process depends on the size of the database. Before you start the backup process, verify the amount of disk space used by the data you want to back up, and make sure the system has enough free disk space. Although the script produces compressed output, the backup process requires sufficient temporary disk space.

For command details, see backup.ovpl

To restore NPS data:

1. Log in to the NPS system with the same account used to install NPS.
2. Run the following command:

```
restore.ovpl [-h] [-b <file>] [-l] [-r DBFILE=>NEW_PATH_TO_
DBFILE.iq[,DBFILE=>NEW_PATH_TO_DBFILE.iq]]
```

In this instance:

`-h`	displays this text
`-b <file>`	specifies backup file
`-l`	lists file content without restoring
`-r DBFILE=>NEW_PATH_TO_ DBFILE.iq[,DBFILE=>NEW_ PATH_TO_DBFILE.iq]`	allows one or more database file to be restored to the specified (non-default) location

The restore operation overwrites all preceding NPS data.

When the restore is complete, the ETL service will not be running. You must restart the service to resume the processing of new data. To start ETL, run the startETL.ovpl, startALL.ovpl command, or use the Start button on the Configuration Utility.

If you change the password of the database after a backup operation, you must change it again after restoring the backed-up database.

For command details, see restore.ovpl.

Related Topics

- "Incremental Backup" (on page 26)
- "Backing Up and Restoring on the Same System" (on page 27)
- "Restoring a Backup Made on a Previous Product Version" (on page 27)

- "Restoring a Backup Made on a Different System with Different Installation Directories" (on page 28)
- "Restoring a Backup When Additional Files Were Added to Extend the Database" (on page 29)

Incremental Backup

A comprehensive backup strategy is essential for disaster recovery. Although full backups are simple to implement and easy to execute when restoration is required, they can slow down processes that are running, take a long time to complete, and require large (sometimes excessively large) amounts of storage.

Incremental backups, however, can balance speed, resource conflicts, and required storage against ease of restoration.

The purpose of a backup is to provide a recovery point. Different systems have different requirements for recovery points. A backup strategy that offers daily recovery points can be implemented through a weekly schedule of full backups combined with incremental daily backups on all other days.

For additional security, each backup should be stored on removable media and made secure. This should also include creating several generations of media.

To implement a backup strategy that incorporates four generational copies:

1. Run a full backup.ovpl backup on a weekly basis.

   Use no backup flags (that is, c, d, or f) so that the database, the content store, and the file system are backed up.

   Here is an example:

   - Linux:

     ```
     $NPSInstallDir/bin/backup.ovpl -b /var/backup/full
     ```

   - Windows:

     ```
     %NPSInstallDir%\bin\backup.ovpl -b E:\backup\full
     ```

2. Copy the backed up data to one of four versions of backup tapes.

   Backup tapes should be kept off site. Alternatively, they can be created directly using WAN links to copy data.

3. Run an incremental backup on a daily basis.

   Use no backup flags (c, d, or f) , so that the database, the content store, and the file system are backed up.

   Use the optional –i flag to perform an incremental backup.

   Here is an example:

   - Linux

     ```
     $NPSInstallDir/bin/backup.ovpl -b /var/backup/incremental -i
     ```

- Windows

```
%NPSInstallDir%\bin\backup.ovpl -b E:\backup\incremental -i
```

Only changes since the last backup (full or incremental) are saved.

4. Copy the backed up data to one of four backup tapes.

   Append the data. Do not overwrite existing backed up data.

If restoration is required:

- Restore from the desired full backup. See restore.ovpl.
- Restore (in sequential order) each incremental backup from oldest to most recent.

Notes:

- When restoring an incremental backup that includes the content store, you must restore each backup in turn without starting the BI Server. If you start the BI Server, it will write to the content store database and prohibit restoring from any further incremental backups.
- If you do write to the content store database before restoring an incremental backup, you must return to the full backup and start the restoration process again.

Related Topics

- "Back Up and Restore" (on page 24)
- "Backing Up and Restoring on the Same System" (on page 27)
- "Restoring a Backup Made on a Previous Product Version" (on page 27)
- "Restoring a Backup Made on a Different System with Different Installation Directories" (on page 28)
- "Restoring a Backup When Additional Files Were Added to Extend the Database" (on page 29)

Backing Up and Restoring on the Same System

If the backup is restored on the same system with the same installation directories and product version as the backup, the entire contents of `$NPSDataDir` will be restored, including all config files, archived data files, the database, and the content store.

Related Topics

- "Back Up and Restore" (on page 24)
- "Incremental Backup" (on page 26)
- "Restoring a Backup Made on a Previous Product Version" (on page 27)
- "Restoring a Backup Made on a Different System with Different Installation Directories" (on page 28)
- "Restoring a Backup When Additional Files Were Added to Extend the Database" (on page 29)

Restoring a Backup Made on a Previous Product Version

Backups made on earlier product versions can be restored with some limitations.

- User configurable settings (retention and installed Extension Pack list) are merged into the current settings.
- Other (internal) configuration files are not restored.
- Archived data files are not restored.
- The database and content store are restored.
- All Extension Packs must be installed again to ensure that the reports and database structures are upgraded to the latest version.
- You might have to rerun the Performance iSPI Enablement script (NNM) and Configuration Utility.

Related Topics

- "Back Up and Restore" (on page 24)
- "Incremental Backup" (on page 26)
- "Backing Up and Restoring on the Same System" (on page 27)
- "Restoring a Backup Made on a Different System with Different Installation Directories" (on page 28)
- "Restoring a Backup When Additional Files Were Added to Extend the Database" (on page 29)

Restoring a Backup Made on a Different System with Different Installation Directories

Backups made on a different system with different installation directories can be restored with some limitations.

- User configurable settings (retention and installed Extension Pack list) are merged into the current settings.
- Other (internal) configuration files are not restored.
- Archived data files are not restored.
- The database and content store are restored.
- All Extension Packs must be installed again to ensure that the reports and database structures are upgraded to the latest version.
- You might have to rerun the Performance iSPI Enablement script (NNM) and Configuration Utility.

Related Topics

- "Back Up and Restore" (on page 24)
- "Incremental Backup" (on page 26)
- "Backing Up and Restoring on the Same System" (on page 27)
- "Restoring a Backup Made on a Previous Product Version" (on page 27)
- "Restoring a Backup When Additional Files Were Added to Extend the Database" (on page 29)

Restoring a Backup When Additional Files Were Added to Extend the Database

If the dbsize.ovpl utility was used to extend a database by adding additional files to the DBSPACE, the backup will attempt to restore these files to the same directory as the standard database files.

To relocate database files during a restore:

The `-r` option enables you to identify one or more DBFile names and corresponding OS path or file name locations where each should be restored.

When dbsize.ovpl is used to add files, the DBFile names used will look like `perfspi_USER_MAIN_<timestamp>`. You can use the `-l` option to determine the files to be included in your backup (for backups made on 9.20 and later).

You can specify a different OS path or file name when restoring by using the `-r` option; for example, `restore.ovpl -b backup.20111027135608.tar.gz -r "perfspi_USER_MAIN_3466235673656=>C:/new location/perfspi_USER_MAIN_3466235673656.iq"`.

If you backed up the content store using the standard backup utility provided in earlier releases, you will not be able to restore them in the current release. Tthe current database backup format is incompatible with earlier releases.

Related Topics

- "Back Up and Restore" (on page 24)
- "Incremental Backup" (on page 26)
- "Backing Up and Restoring on the Same System" (on page 27)
- "Restoring a Backup Made on a Previous Product Version" (on page 27)
- "Restoring a Backup Made on a Different System with Different Installation Directories" (on page 28)

Configure NPS

If you install NPS on the NNMi management server, configuration takes place automatically during the installation. After installation, you can use the Configuration utility to make changes.

If you install NPS on a dedicated server, you must use the Configuration utility to specify configuration details. At the end of the installation, before the NPS ETL services are started, the Configuration utility asks you necessary configuration details.

To launch the Configuration utility:

- Windows:

  Select **Start** > **All Programs** > **HP** > **NNM iSPI Performance** > **Configuration Utility**

- Linux:

  Run `runConfigurationGUI.ovpl`

Configuration Utility

You can use the Configuration utility to specify the following values.

Configure the iSPI Performance service to log on as:

Windows Only

- When NPS is installed on a dedicated Windows server, you must select "Named User account." For detailed instructions, see the "Installing NPS" section of the *HP Network Node Manager iSPI Performance for Metrics Installation Guide*.

  You must provide the same account information that was used with the enablement script on the NNMi management server.

- When NPS is installed on a Windows NNMi management server, you must select "Local System account." For detailed instructions, see the "Configuring NPS with the Configuration Utility" section of the *HP Network Node Manager iSPI Performance for Metrics Installation Guide*.

Specify the path to iSPI Performance data files folder:

- If NPS is installed on the NNMi management server, a local path is displayed in this field. You *should not* change this value. For detailed instructions, see the "Using the Configuration Utility" chapter of the *HP Network Node Manager iSPI Performance for Metrics Installation Guide*.
- If NPS is installed on a dedicated server, the enablement script creates a shared space on the NNMi server.

You must specify the location of the shared space in the correct format.

Daily Data Retention Period (days)

The default setting is 800.

Hourly Data Retention Period (days)

The default setting is 70 days.

The maximum retention period is 400 days.

Raw/Detailed Data Retention Period (days)

The default setting is 14 days.

The maximum retention period is 400 days.

Service status:

Click Stop or Start to stop and start necessary NPS processes.

If you change any of the default settings, click **Apply** and **Exit**.

To retain the originally configured settings, click **Exit**.

See also "Master Runtime Configuration File NNMPerformanceSPI.cfg" (on page 30)

Master Runtime Configuration File NNMPerformanceSPI.cfg

The NNMPerformanceSPI.cfg file controls the operation of the iSPI Performance for Metrics.

The file contains values written by the Configuration Utility, as well as many other options with their standard and recommended settings. Users should NOT modify the contents of this file directly. Doing so can affect the functionality and performance of NPS and render it unsupportable.

User Groups and Security Groups in NPS

Both NNMi and NPS restrict access to data based on user/UserGroup/SecurityGroup/node mappings.

User Groups and Security Groups are created by NNMi administrators. For each user, NPS filters the data queries for all reports and ad hoc queries, so that the user has access only to data for managed nodes whose Security Groups are associated with the User Groups to which the user belongs.

NPS data security restricts all data access according to the following policies:

- Filter the fact table queries for all report graphs and tables, including reports created using Query Studio.
- Filter the dimension data queries used in topology filter prompts or in Query Studio.
- Filter group member queries used in topology filter prompts or in Query Studio. NPS does not display data related to the groups, where none of the members have access to the report data.

The NNMi built-in User Groups "NNMi Administrators (admin)" and "NNMi Global Operators (globalops)" are automatically granted visibility to all performance data regardless of security group assignments. All users who are assigned to either the NNMi admin or globalops User Group have full access to all data in reports and queries.

Members of the "NNMi Administrators (admin)" User Group are granted full administrative privileges to the NPS BI Server, and have unfettered rights to save, move,delete content (including content created or owned by other users), and perform other administrative tasks.

Members of the "NNMi Global Operators (globalops)" User Group are granted read-only access to all data, including reports and queries saved by other users, but do not have administrative capabilities on the NPS BI Server and cannot modify the content of public folders or other User Group folders.

Example

Say that NPS data is divided among the following locations:

- Site A
- Site B

And each location includes the following local users:

- Operator 1: This user can access data for only Site A.
- Operator 2: This user can access data for only Site B.

The following global users can access data from all locations:

- Admin: The NNMi and NPS Administrator administers both locations and accesses NPS data from all locations.
- GlobalOperator: The user for both Site A and Site B must access NPS data in both locations.

Once the administrator (Admin in this example) creates these User Groups in NNMi, NPS ensures that access to NPS features and data is restricted according to the privileges defined for each User Group.

User Account	NPS User Group	NPS Access Privileges
Admin	NNMi and NPS Administrator	• Can access all NPS data irrespective of location • Can access all user group data in NPS • Can add, modify, or delete NPS users and user groups using NNMi console • Can access all report templates, schedule reports, and define global report settings
GlobalOperator	Global Operator	Can generate reports for all sites, including Site A and Site B
Operator 1	Level 1 Operator	Can generate reports for only Site A
Operator 2	Level 1 Operator	Can generate reports for only Site B

For more information on configuring User Groups, see "Configuring Security" in the *HP Network Node Manager i Software Online Help for Administrators*.

Check the Validity of NNM iSPI Performance Configurations

The Configuration Checker enables you to verify the validity of the configuration file entries. It displays the following message if all the entries are valid:

```
INFO: Configuration File Validated OK
```

To launch the Configuration Checker:

- Windows:

  Select **Start** > **All Programs** > **HP** > **NNM iSPI Performance** > **Configuration Checker**

- Linux:

  Run `checkConfig.ovpl`

Collect Diagnostic Data for Support

The Diagnostics Collector utility enables you to collect diagnostic data for Support. The data will be used to to diagnose the problem.

To launch the Diagnostics Collector:

- Windows:

  Click **Start** > **All Programs** > **HP** > **NNM iSPI Performance** > **Diagnostics Collector**

- Linux:

  Run `collectDiagnostics.ovpl`.

The Diagnostics Collector saves the output, in the form of a compressed tar.gz file, in the following location:

- Windows:

  %NPSDataDir%`\HPNNMPerformanceSPI\collectDiag`

- Linux:

  `/var/opt/OV/HPNNMPerformanceSPI/collectDiag`

Forward the tar.gz file from the collectDiag folder to Support.

Reset NPS

The reset utility enables you to delete all data from the database with the following options:

- Keep all archived data.
- Restore archived data for re-processing.
- Delete all archived metrics/topology.
- Delete all archived data and log files and restart all services.

To launch the NPS Reset utility:

Windows:

Select **Start** > **All Programs** > **HP** > **NNM iSPI Performance** > **Reset Utility**

Linux:

Run `resetSPI.ovpl`

The Reset Utility window displays the following options:

```
1. Delete all data from database, & keep all archived data

2. Delete all data from database, & restore archived data for re-
processing

3. Delete all data from database, & delete all archived
metrics/topology

4. Delete all data from database, delete all archived data and
logfiles, & restart all services

5. Delete and recreate entire database using default size, location,
and options

Enter Option (1-5), or Q to quit:
```

Retrieve Last Login Information for a User

Whenever a user logs in to NPS, the following information is recorded in the log file:

- User name
- Logon date
- Logon time

To find user login information:

- Windows:

  %NPSDataDir%`\NNMPerformanceSPI\logs\perfspiAudit.log`

- Linux:

  `/var/opt/OV/NNMPerformanceSPI/logs/perfspiAudit.log`

Analyze Log Files

The Log File Analyzer enables you to view the following:

- A daily summary of errors, warnings, and other notifications produced by each process within each Extension Pack
- Timing data for selected processes belonging to each Extension Pack
- Timing data for generating reports for different Extension Packs

The Log File Analyzer analyzes the `prspi.log` and `PerfSPI_Diagnostic_Metrics.log` files.

To launch the Log File Analyzer:

Windows:

Select **Start** > **All Programs** > **HP** > **NNM iSPI Performance** > **Log File Analyzer**

Linux:

Run `log_analyzer.ovpl`

Warnings, Errors, and Other Notifications in iSPI for Performance Log Files

Summary data for warnings, errors, and other notifications covers the previous two weeks. The last summary covers today. The summary for today is incomplete until midnight. Summary data indicates the following:

- Date
- Number of errors per process, if any
- Number of warnings per process, if any
- Number of processes with fatal errors, if any

Here are examples:

```
prspi.20080729.log:
WARN  - 240 in ETL.Component_Health
WARN  - 268 in ETL.Interface_Health
WARN  - 285 in MainServiceLoop
ERROR - 2 in MainServiceLoop
prspi.20090915.log:
WARN  - 27 in ETL.Interface_Health
WARN  - 714 in MainServiceLoop
FATAL - 1 in Utility.startBI
FATAL - 152 in ETL.Interface_Health
FATAL - 1 in Utility.installExtensionPack
```

A warning normally indicates a transient condition, usually a temporary mismatch, that will self-correct. If you see a warning message or a fatal error message, you can examine it in more detail by viewing the associated logfile in a text editor.

The last log in the list is today's partially complete log. This partially complete log does not have a date attached to it. The file name for today's log is `prspi.log`

View Timing Data

Under the summary of all warnings and errors, if you press **Enter**, you can continue to see the timing data.

The timing data shows the following:

- Total number of times a process executed over the previous two weeks
- Average execution time per process over the previous two weeks and standard deviation
- Maximum execution time per process over the previous two weeks
- Average number of records processed per execution
- Average number of records processed per second

Monitor Log Files

The log file viewer is Chainsaw 2.0. With Chainsaw, you can monitor DEBUG, INFO, WARN, ERROR, and FATAL messages as they reach the `prspi.log` file. The file contains every message generated since the previous midnight. The path to the file is:

- Windows:

  %NPSDataDir%`\NNMPerformanceSPI\logs`

- Linux:

  `/var/opt/OV/NNMPerformanceSPI/logs`

To launch the Log File monitor:

- Windows:

  Select **Start** > **All Programs** > **HP** > **NNM iSPI Performance** > **Log File Monitor**

- Linux:

  Run `runChainsaw.ovpl`

Use the Chainsaw Message Interface for the NNM iSPI Performance

The welcome page includes several tabs. To open the message interface, click the **NNMPerformanceSPI/logs/prspi.log** tab.

The Chainsaw message interface displays the following panes:

- Event pane
- Detail event pane
- Tree logger pane

The event pane changes constantly, displaying the most recent message in prspi.log. Additional information about that message appears in the detail event pane. When you select an older message in the event pane, the detail event pane refreshes with additional information about that message.

The detail event pane indicates the following:

- Level
- Logger
- Time
- Thread
- Message
- NDC [null]
- Class [not used]
- Method [not used]
- Line
- File
- Properties
- Throwable [not used]

The logger tree pane shows the **Root Logger** folder.

The ETL folder, which appears under the Root Logger folder, contains three logger folders, one for each standard Extension Pack. An additiional logger folder appears for any additional Extension Packs that are installed.

New messages generated by the logger folders appear once every few seconds in the event pane. To see messages for one logger only, type that logger name in the **Refine focus on** field; for example:

```
Refine focus on:Interface_Health
```

You can expand the event pane by closing the logger tree pane and the detail event pane.

Chainsaw version 2.0 features enable you to:

- Fully customize each tab.
- Control the frequency of updates.
- Specify your own rules for color-coding events (the defaults are yellow for WARN, red for ERROR).
- Apply simple filters, or advanced expression-based filters.
- Save memory by setting a cyclic-based view that looks at X events only.

For more information about Chainsaw, run the tutorial under the Help menu or go to `http://logging.apache.org/chainsaw/quicktour.html`

Enable Demo Data

The demo database is part of NPS. The NPS installation places the demo database on the system. To view reports using the demo data, you must enable the demo database.

Enabling the demo database does not disrupt the ongoing data collection process of NPS. When you disable the demo database, NPS begins to build reports using the real network data.

Windows:

- To launch the Demo Data Enable utility, select **Start** > **All Programs** > **HP** > **NNM iSPI Performance** > **Demo Data Enable**.
- To disable the demo database, select **Start** > **All Programs** > **HP** > **NNM iSPI Performance** > **Demo Data Disable**.

Linux:

- To enable the demo database, run:

  `demoData.ovpl enable`

- To disable the demo database, run:

  `demoData.ovpl disable`

If you logged on via http://localhost:9300, you will receive an error message informing you that NPS is unable to redirect you to the NNMi log-in page. Do either of the following:

- Log in as the BI Server Administrator. Click the link for the iSPI Performance navigation pane on the page that is displayed. From the BI Server pane, use the "log on as Administrator" link. (The username is ErsAdmin, the default password is rooDkcaBnimdAsrE. The password can be changed using the changeBIpwd.ovpl command.)

Or

- Log in to the NNMi system directly as an NNMi user, and launch NPS from NNMi.

NPS Databases

NPS offers long-term reporting on performance metrics. These metrics are stored in a database. The database offers regular, bulk insertion of large volumes of data, as well as fast access to large quantities of numeric data, including dynamic summarization for multiple users. This is offered by a column store database rather than a traditional relational database.

NPS installs the Sybase IQ column store database, which functions as the primary storage area for collected data from all installed iSPIs.

NPS also requires a traditional relational database, which provides for long-term storage of non-numeric, lower-volume data, including report templates, data models, user and group information, report schedules, and report schedule output for its BI server. This database is referred to as the content store.

NPS installs the Sybase ASE relational database, which functions as the content store.

Both databases are installed and configured automatically based on the resources available on the server at installation.

Recreate the Database

You can recreate your Sybase IQ data storage database and start over with the installation default size of 2.5GB. This feature can be useful if your existing database has grown too large, or if you want to lower your retention settings. Lowering the retention settings will maintain the smaller size of the database for a longer period of time.

To recreate your database:

- From the command line, run `resetSPI.ovpl`.

  Or

- From the Windows Start menu:

  RESET SPI

  Option 1. Delete all data from database, & keep all archived data

  Option 2. Delete all data from database, & restore archived data for reprocessing

  Option 3. Delete all data from database, & delete all archived metrics/topology

  Option 4. Delete all data from database, delete all archived data and logfiles, & restart all services

  Option 5. Delete and recreate entire database using default size, location, and options

  Enter Option (1-5), or Q to quit:

Option 5 deletes the database, discards all data stored in the database, and recreates it, establishing the schema for each installed Extension Pack.

To restore archived data files for reprocessing (by default, NPS stores 28 days of archived data files), use Option 2 before you recreate the database with Option 5.

Note: It is *not* possible to restore a previous backup into the recreated database and preserve its smaller size. The backup restoration can only recreate the database files at the size they were when they were backed up. It is possible, however, to relocate the database files to an alternative location during a restore with the `restore.ovpl -r` option.

The database is created in the default data folder, `$NPSDataDir/database`. You can choose another location by doing the following:

- On Linux, mount an alternate filesystem to `$NPSDataDir/database` before running `resetSPI.ovpl`.
- Back up the recreated (empty) database and restore it to a different location using the `-r` option.
- Leave the default 2.5GB database files in the default location, but use `dbsize.ovpl` to add sufficient additional files to the database and an alternative location.Make sure that the database is made sufficiently large for steady state operations, so that NPS will not attempt to automatically expand the default files to make database space at runtime.

You can find detailed information about the commands here.

Access Performance Troubleshooting

For operational performance management, NNM supports an external launch to the performance analysis panel, which creates graphs that enable you to analyze the topology objects (nodes and interfaces) on your system.

To access this feature, go to the NNM console. Select either a node or an interface, open the Actions menu, select **Performance** > **Troubleshooting**.

The Performance Troubleshooting window is divided into two panes. Pane 1 shows a tree view with the root node called Network. When expanded, all the nodes in the network that were performance polled are shown. The interfaces for these nodes are also shown. Pane 2 appears blank. However,

if you unselect the Quick view option, a third pane appears showing two graphs, Pre-defined and Metrics.

You can drag and drop metrics to produce graphs for a selected time period.

For more information, see PerfSPI_4501_NNMiPerfTroubleshooting.htm.

Reference Pages

You can open a reference list of available commands by going to the command index.

Each command reference page provides the following information:

- Name
- Synopsis
- Description
- Author

For example, you can find information about the backup command at backup.ovpl.

To access information about the restore command, see restore.ovpl.

On Windows, many of the commands are Start menu options.

HP iSPI Performance BI Server Portal

The HP iSPI Performance BI Server Portal enables you to perform the following tasks:

- Open **Public Folders** and access reports from **BI Server Connection**.
- Open **My Reports** and view reports with the filter preferences you saved.
- Set up the following preferences:
  - Set up the display parameters for the reports.
  - Select the report format
  - Set up a schedule for running summary reports.
  - Set up email report delivery.
  - Modify BI Server tuning parameters for large multi-user installations.
  - Select language for your reports
- Create custom reports using Query Studio.

Launch the iSPI Performance BI Server Portal

To launch the iSPI Performance BI Server Portal:

1. Log in to NPS as Administrator.
2. On the navigation panel on the NPS home page, click **BI Server**.

   The BI Server Log On page opens.

3. Log in using the ErsAdmin username and password. The default password is rooDkcaBnimdAsrE.

   HP recommends changing this password after logging in for the first time. To change the password, run `changeBIpwd.ovpl`.

Optionally, you can start the iSPI Performance BI Server Portal as follows:

1. Select **Start** > **All Programs** > **HP** > **NNM iSPI Performance** > **BI Server Portal**
2. Run `launchReport.ovpl`

Web Access:

1. Go to http://<*localhost*>:9300/p2pd/NPS.html.
2. On the login page, enter your ErsAdmin username and password.

Log In to the iSPI Performance BI Server Portal as ErsAdmin

If you are unable to launch NNMi, you can reach the iSPI Performance BI Server Portal by going to `http://<localhost>:9300/p2pd`.

When the login page opens, type your ErsAdmin username and password. The default password for this user account is `rooDkcaBnimdAsrE`.

HP recommends changing this password after you log in to the iSPI Performance BI Server Portal for the first time using the ErsAdmin username. To change the password, run the `changeBIpwd.ovpl` command.

Restart the iSPI Performance BI Server Portal with the new password after you change the default password..

If you cannot launch NNMi, contact Support.

If you can open the iSPI Performance BI Server Portal, you can confirm that the BI Server is running.

Change Report Format Preferences

The default report format used by NPS and the BI Server is HTML.

You can set the iSPI Performance BI Server Portal preferences and enable NPS to generate reports in any of the following formats:

- Adobe PDF
- Microsoft Excel 2007
- Microsoft Excel 2002
- Microsoft Excel 2000 Single Sheet
- Comma Separated Value (CSV) Files: displayed as Delimited Text (CSV) in the iSPI Performance BI Server Portal
- XML

To change the format of the reports generated by NPS:

1. Log in to NPS home page with administrator privileges.
2. On the navigation panel, click the **BI Server** tab.
3. Select the **BI Portal** link.
4. In the iSPI Performance BI Portal form, click  **My Area**.
5. Select **My Preferences**.
6. In the General tab, select a Report Format. The default format is HTML.
7. Click **OK**.

The new report format becomes the default report format for your user account. The BI Portal applies the new report format to all reports generated from your user account.

Set the Same Schedule for Multiple Reports

To set the same schedule for multiple reports, you must create a job. A job identifies a collection of reports, report views, or queries that are scheduled together and share the same settings.

To set the same schedule for multiple reports:

1. Click the  **New Job** icon on the toolbar.

   The New Job wizard opens.
2. Specify a name and location for the job.
3. In the Select the steps–New Job wizard form, click **Add** to add the job steps.

   You can submit the steps in sequence or all at once. To modify the sequence of steps, click **Modify the sequence** and rearrange the sequence of steps.
4. In the Select an action-job form, specify whether you want to save and run, schedule, or only save the new job.
5. Click **Finish**.

BI Server Guidelines for Tuning Performance

The BI Server has tuning performance guidelines for single-server systems and distributed systems. The HP Network Node Manager i Software Smart Plug-in is a single-system installation. You can ignore the text about distributed systems in the BI Server documents that discuss performance tuning.

The following two parameters are especially important:

- Maximum number processes for the Interactive Report Service
- Maximum number processes for the Batch Report Service

If you have a lot of concurrent users, you might want to allocate more server resources to processing queries. You can do that by resetting the maximum number of interactive services to two per processor. If you have fast processors, you can set the maximum number of interactive services to three. Thus, if you had 16 processors and set the number to two, you would end up with 32 interactive services.

Creating a New Folder in the BI Portal

To create a new folder in the BI Portal:

1. In the HP NNM iSPI Performance BI Portal, click **New Folder**.
2. In the New Folder Wizard form, specify the name, description, and location for the new folder.
3. Click **Finish**.

BI Server Documentation

To access the BI Server documentation, click **Help** on the BI Server Portal.

Custom Poller

NNMi's Custom Poller feature uses SNMP MIB variables to gather additional device information that is useful in managing your network. The Custom Poller enables you to:

- View the list of topology nodes for which additional information is being polled as well as the name of the associated Policy.
- View the polling results. The first time the results for a specified MIB variable are discovered, the results appear in a Polled Instance object. The Polled Instance object is updated whenever a change in State is detected and includes the most current polled value that caused the State to change.
- View incidents that are generated by Custom Poller for a MIB Poll Variable.

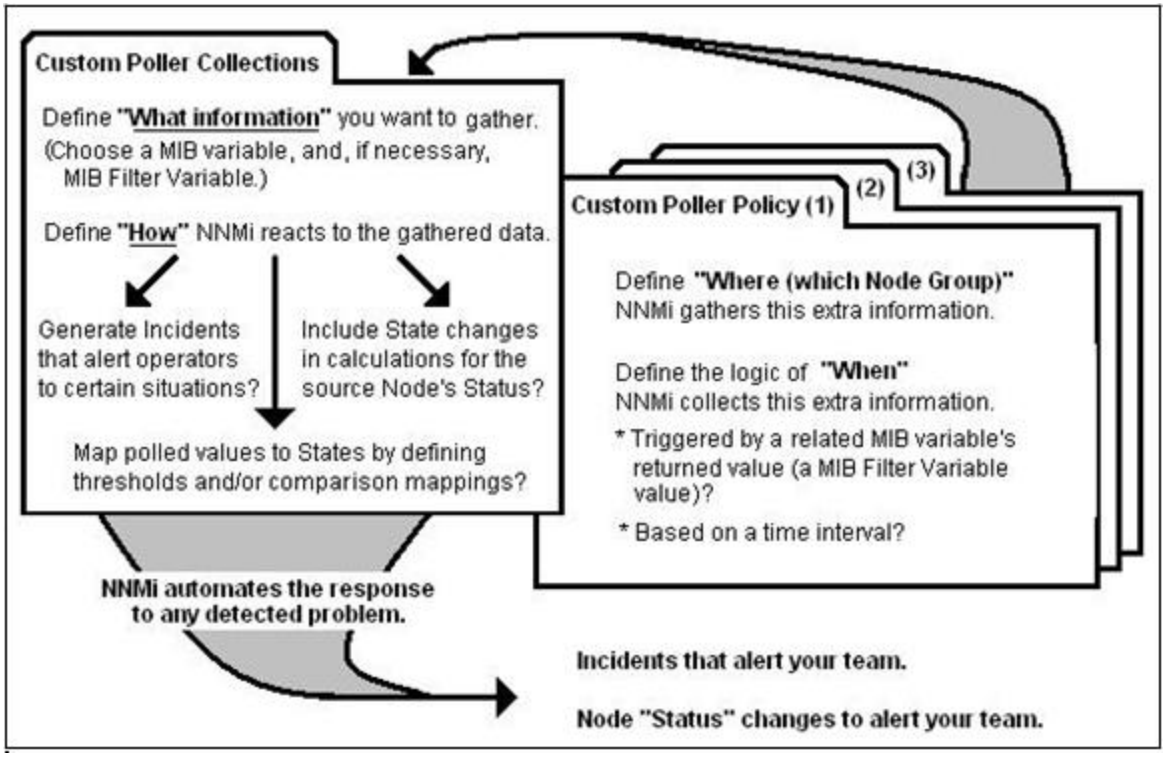
For example, as an administrator, you could have NNMi monitor the Status of COM (communication) ports on all of your Windows servers. You could also configure NNMi to send incidents when certain MIB values are detected. Or to map returned MIB values to States and include those States as part of the node Status calculations.

As an operator, the Custom Poller enables you to:

- View the list of topology nodes for which additional information is being polled as well as the name of the associated Policy.
- View the polling results. The first time the results for a specified MIB variable are discovered, the results appear in a Polled Instance object. The Polled Instance object is updated whenever a change in State is detected and includes the most current polled value that caused the State to change.
- View incidents that are generated by Custom Poller for a MIB Poll Variable.

You can use the data collected by Custom Poller collections to construct and view reports using the iSPI Performance for Metrics.

Overview of Custom Poller Collections and Their Associated Policies



See the NNMi online help for more information on the Custom Poller feature.

Reports for Custom Poller Collections

You can configure the iSPI Performance for Metrics to create reports based on the data collected by NNMi's Custom Poller. The Report Groups tab in the Custom Poller Configuration form enables you to generate reports from the metrics obtained from Custom Poller collections.

The iSPI Performance for Metrics creates new Extension Packs to display reports generated from the data collected by Custom Poller collections.

Creating Additional Extension Packs

When you add a report group to the Report Groups tab, NNMi creates an Extension Pack for each SNMP MIB table referenced in the Custom Poller collection. On the NPS home page, the Extension Pack reflects the name of the SNMP MIB table. Multiple Custom Poller collections are combined into a single Extension Pack if the collections use OIDs from the same MIB table.

Custom Poller Report Controls

You can use the standard report control links to access Time Controls, Topology Filters, Report Options, and Adjust Time Range filters. You can search using any of the available attributes and set filters to create a report based on the modification.

Time Control Tab

On the navigation panel of the NPS home page, click the Time Control tab to change the default time filters for a report.

Time Control Filters

Filter	Usage
	Click the drop-down calendar box and select the appropriate date. By default, the date is automatically set to the current date when you select the Time Range.
	To set the time manually, select the Hour/Minutes/Meridian options separately, and then select the value by clicking the arrow. By default, the time is automatically set to the current time when you select the Time Range.
Time Range Menu	Click the drop-down menu to display the list of time ranges, and select the appropriate time. If you select a time range that is beyond the **Start Date and Time**, the following message appears: `Your start date/time is out of range. It will be adjusted.` Click **OK** to adjust accordingly.
Auto Refresh	Click the drop-down menu, and select the desired time to recreate the reports based on the set interval. By default, the Auto Refresh option is OFF. The Auto Refresh option appears on the Time Controls page only after the first report is generated.

Topology Filters Tab

On the navigation panel of the NPS home page, click the "Set Topology Filters" (on page 55) tab to launch the Topology Selector.

The Topology Filter enables you to quickly find or select an element from the topology table using selection mechanisms appropriate for the attribute type.

Attributes and Related Parameters Available for the Topology Filters

Attribute	Parameter
Node Group Name	Lists available Node groups in the network.
Node Name	Lists available Node names in the network.
Node Contact	Lists available Node Contacts in the network.
Node Location	Lists available Node Locations in the network.
Node Family	Lists available Node Families in the network.
Node Vendor	Lists available Vendors in the network.

Attribute	Parameter
Node ID	Lists available Node IDs in the network.
Node UUID	Lists available Node UUIDs in the network.
Index	Lists available Indexes in the network. Contains the SNMP index OID values that identify specific MIB table instances polled by Custom Poller policies. You can use these SNMP index OID values to filter Custom Poller reports to show only specific instances from the MIB table (use in conjunction with the NodeName filter).

Report Options

On the report, click the Options link to access the Report Options panel.

Report options provide a list of primary and secondary metrics for the selected Custom Poller Extension Pack.

The metrics drop-down list differs according to the selected extension pack.

Create Extension Packs for Custom Poller Collections

To create an Extension Pack for a Custom Poller Collection, you must create a report group for a Custom Poller Collection from the NNMi console.

Prerequisite: You must log on to the NNMi console with administrative privileges.

Task 1: Create a Custom Poller Collection

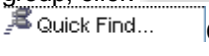
Create a Custom Poller Collection in the Custom Poller Configuration form by following the instructions in "Create a Custom Poller Configuration," which can be found in the *HP Network Node Manager i Software Online Help for Administrators*.

Task 2: Create a Custom Poller policy

Create a Custom Poller policy in the Custom Poller Configuration form by following the instructions in the *HP Network Node Manager i Software Online Help for Administrators*.

Task 3: Create an Extension Pack for a Custom Poller Collection

1. **Navigate to the Custom Poller Configuration form**.
   a. From the workspaces navigation pane, select the **Configuration** workspace.
   b. Select **Custom Poller Configuration**.
2. In the Custom Poller Configuration form, select the Report Groups tab.
3. Click **New**. The Report Group form opens.
4. In the Report Group form, specify a name for the Extension Pack in the Basics section. Do not use spaces in the name.
5. In the Report Collections tab, click **New**. The Report Collections form opens.

6. To add a Custom Poller Collection to the report group, click  (the Lookup icon):
   - To specify a Custom Poller Collection, click  **Quick Find**.
   - To create a new Custom Poller Collection, click  **New**.
7. Set the Report Data Type to one of the following values:
   - **Gauge**: Represents single non-cumulative values. Examples of Gauge data types include Response Time, Bit Rate, and Temperature. During aggregation, the iSPI Performance for Metrics calculates the minimum, maximum, and average values of gauge metrics.
   - **Percent**: Represents single non-cumulative values that are formatted with a percent sign (%) and two decimal places. Examples of Percent data types include Utilization and Discard Rate. During aggregation, the iSPI Performance for Metrics calculates the minimum, maximum, and average values of percent metrics.
   - **Counter**: Represents incremental values. Examples of Counter data types include byte counts, packet counts, and flow counts.
8. In the Report Collections form, click **Save and Close**.
9. In the Report Group form, click **Save and Close**. The iSPI Performance for Metrics creates a new Extension Pack and adds a new tab on the Report Menu page.

Guidelines to Creating a Custom Poller Extension Pack

- You can associate a Custom Poller Collection with only one report group.
- If you associate more than one Custom Poller Collection with the same Report Group, make sure the combination of Collections generates a meaningful report. Select Collections whose MIB Variables represent the same index value across Custom Poller Collections.
- Avoid using keyboard symbols while naming the Custom Poller collection and customPoll OID. The symbols `<,>,",',&,\` are replaced by a **!** character in the report.
- Reports are not created if the **#** symbol is used in a customPoll name.

Remove Custom Poller Extension Packs

You can use command line tools to remove Custom Poller Extension Packs.

To remove Custom Poller Extension Packs:

1. Log in with administrative or root privileges to the system where NPS is installed.
2. To view the list of Extension Packs, run:

   `uninstallExtensionPack.ovpl`
3. To delete a specific Extension Pack, run:

   `uninstallExtensionPack.ovpl -p<extension_pack_name>`

You cannot recover the data associated with an Extension Pack if you inadvertently delete it. Make sure to type the correct Extension Pack name with the command. Do not delete the following default Extension Packs unless you want to remove iSPI Performance for Metrics reports: Interface_Health, Component_Health. If you delete the PerfSPI_Diagnostics Extension Pack, you will not be able to monitor the health of NPS processes.

Modify Topology Attribute Values and Group Memberships from NNMi

The topology attributes and groups help you filter the data and build the report with data polled from the nodes and interfaces you select. NPS retrieves the topology attribute details from NNMi and other iSPIs. If you make modifications to topology attributes and group memberships from NNMi, the changes are reflected in NPS within about an hour.

Changes are not applied retroactively to the existing data. Changes are always forward-looking. NPS preserves the historical accuracy of the data as it was when it was collected.

For example:

- If a new node is added to a group, it is only added for the new data collected going forward. NPS cannot assume that the node was a member of the group in the past.
- If an interface attribute changes—for example, if speed is changed from an old to a new value—the change is applied going forward. NPS does not assume that the new speed applies to the historical data.

If you delete or change a member of a topology attribute, the old member continues to appear in the list of topology filters in NPS. The old attribute member continues to appear in the list of topology filters. If you select the old member, the data collected before making the change gets sampled in the report.

Example

Say you modify node group name A to node group name B in the NNMi console. The new node name will appear in NPS after an hour or so. Later, the old node group name will continue to appear in the list of node groups in the Topology Filters section. But, if you select A, you will not be able to retrieve data samples associated with A that are polled after the node group name was changed to B.

Suppose you had an interface group called Oracle Server Ports that identifies switch interfaces assigned to your Oracle Server cluster, but now you have a new server cluster available online. You decide to transfer your Oracle applications to the new one and repurpose the old servers to host the Microsoft Exchange Server.

You therefore rename Oracle Server Ports to Exchange Server Ports and create a new interface group for Oracle Server Ports identifying the ports associated with the new servers. If you run a report at the end of the month to see the health of your Oracle Server Ports and your new Exchange Server Ports, NPS will define an Oracle Server Ports group to include the data collected for the original ports up to the time you made the change and for the new ports after that.

Likewise, NPS will define the Exchange Server Ports group to only include the ports from the time the group was renamed. It will not include the ports while they were still being used for Oracle.

Set Polling Characteristics in NNMi

Performance polling impacts NNMi and your network. If you enable additional performance polling, NNMi must allocate a portion of its resources to handle the additional polling. Your network must accommodate an increase in SNMP traffic. To use the system and network resources wisely, limit performance polling to the devices you require the most.

By default, NNMi enables performance polling for the following Node Groups:

- Network Infrastructure Devices
- Routers

The following are some of the ways you can modify the performance polling defaults that will be in place right after the iSPI is installed:

- Set thresholds for a node group you are already polling for performance data (no thresholds are set by default).
- Modify the frequency of performance polling.
- Add nodes to the Important Nodes group, and enable performance polling for this group.
- Enable performance polling for the Microsoft Windows Systems group.

All these processes involve monitoring configuration tasks. Monitoring configuration tasks are related to polling.

For information about any of these processes, see the *HP Network Node Manager i Software Online Help for Administrators*.

Set Thresholds for Metrics in NNMi

Until you set the thresholds for the Extension Pack metrics, the reports in that Extension Pack do not track exception counts.

NNMi does not set thresholds for performance metrics for you automatically. You must set the thresholds for the iSPI Performance for Metrics manually using the Thresholds Settings form in the NNMi console. You can set thresholds for the following metrics:

- Discard rate in
- Discard rate out
- Error rate in
- Error rate out
- Utilization in
- Utilization out
- CPU 5 second utilization
- CPU 1 minute utilization
- CPU 5 minute utilization
- Memory utilization
- Buffer utilization
- Buffer miss rate
- Buffer failure rate

For information about how to set thresholds using the NNMi console, see " Configure Threshold Monitoring for Interfaces (HP Network Node Manager iSPI Performance for Metrics Software)" in the *HP Network Node Manager i Software Online Help for Administrators*.

Although you might want to see exception counts as soon as possible, setting thresholds right away might not be feasible. You might want to wait until you are better acquainted with the way your network behaves. If you set thresholds prematurely, you might experience problems. For example, if the thresholds are wrong, NNMi might detect too many exceptions. Or, if you configure NNMi to generate incidents in response to threshold conditions, NNMi might generate too many incidents.

Threshold Terms Defined

- **High Value (HV)**: Any value above this value is in the high range; any value in the high range triggers a High status.
- **High Value Rearm (HVR)**: Any value below High Value; indicates that the High status has ended.
- **High Trigger Count (HTC)**: The number of consecutive polls a high value must remain the same before the status changes to High. A trigger count of 1 is usually appropriate.
- **Low Value (LV)**: Any value below this value is in the low range; any value in the low range triggers a Low status.
- **Low Value Rearm (LVR)**: Any value above Low Value;indicates that the Low status has ended.
- **Low Trigger Count (LTC)**: The number of consecutive polls a low value must remain the same before the status changes to Low. A trigger count of 1 is usually appropriate.
- **Duration**: The time limit before which the baseline metric state cannot change to Abnormal Range or generate an incident. This time period specifies the minimum time within which the metric value must remain out of the configured Baseline Range.
- **Duration Window**: The window of time in which the Upper Baseline Limt or Lower Baseline Limit criteria must be met.

How to Use Reports

NPS and NNM iSPI Performance for Metrics generate reports on operational metrics over a selected period of time. The content of these reports is defined in the core NPS reports, and is extended by installing additional NNM iSPIs such as the NNM iSPI Performance for Traffic or NNM iSPI Performance for QA.

You can perform the following tasks with NPS:

- View the operational performance of metrics over a period of time.
- Modify the default settings of a report to view additional attributes related to the monitored element.
- Customize dashboards with pre-defined reportlets.
- Customize the schedule and format for report delivery.
- Create customized reports using Query Studio.

Avoid using Cognos BI Report Studio to create or customize NNM iSPI Performance reports. HP does not provide support for such reports.

Launch Reports

You can launch reports created by NPS or NNM iSPI products from NNMi, the NPS home page, or the iSPI Performance BI Server Portal.

To launch a report from the NPS home page:

1. Log in to NPS using either the NNMi console or the NPS home page.
2. On the NPS home page, select **Reports** in the navigation panel.

   NPS presents the default, ready-to-use Self Diagnostic Extension Pack (to generate reports on the performance of NPS itself). Depending on the number of the NNM iSPI products or Extension Packs available on the NPS system, you could see many other sets of reports.
3. Select a report type; for example, Chart Detail or Heat Chart.
4. Modify the default report settings, if required.

On the NNMi Network Overview workspace, if you select a node and click **Actions** > **HP NNM iSPI Performance** > **Reporting - Report Menu**, the Report Menu page presents reports created with the data collected from the selected node.

To navigate back to the NNMi console:

1. In the NPS home page navigation panel, click the **Cross Launching** tab.
2. Click **NNMi Links**.
3. Click **NNMi Console**.

   The NNMi Console link enables you to go back to NNMi workspaces based on the topology objects currently selected in NPS.

Launch Reportlets

You can launch reportlets created by NPS or NNM iSPI products from NNMi, the NPS home page, or the iSPI Performance BI Server Portal.

To launch a reportlet from the NPS home page:

1. Log in to NPS using either the NNMi console or the NPS home page.
2. On the NPS home page, select **Dashboard Reportlets** in the navigation panel.

   NPS presents the default, ready-to-use Self Diagnostic Extension Pack (to generate reportlets on the performance of NPS itself). Depending on the number of NNM iSPI Performance products or Extension Packs available on the NPS system, you could see many other sets of reportlets.
3. Select a reportlet type (for example, Exceptions Pie Chart or Simple Bar and Line Chart).
4. Modify the default reportlet settings, if required.

On the NNMi Network Overview workspace (available in the Topology Maps workspace), select a node and click **Actions** > **HP NNM iSPI Performance** > **Reporting - Report Menu**. The NPS home page presents reportlets created with the data collected from the selected node.

Change the Default Settings for Reports

NPS generates reports with a set of parameters, which are set when you launch a report from the NPS home page or the NNMi console. Every NPS report or reportlet is built with the following sets of parameters:

- **Time controls**

  Time controls help you set the time range for the report or reportlet you want to view. The NPS database stores the data collected from different nodes over a period of time. Using the time controls parameters, you can view a report or reportlet created for the range of time of your choice. You can also select the display grain of a report or reportlet. When a report or reportlet is rendered, the time range is always shown in the Filter Summary section at the top of the report or reportlet.

- **Topology filters**

  The topology filters enable you to create a report that is filtered, or constrained in scope, by specific topology attributes. By default, when you launch a report or reportlet for the first time from the NPS home page, NPS generates the report or reportlet that is not filtered. However, you can select a specific node or a set of nodes from the NNMi console (from the Topology Maps workspace) and then launch the NPS home page to view reports or reportlets only on the selected nodes. The topology filters extend this capability by offering a range of filters on the NPS home page that help you select the data to be included or excluded prior to viewing the report. When a report or reportlet is rendered, the selected filters are always shown in the Filter Summary section at the top of the report or reportlet.

- **Report options**

  Reports and reportlets display graphical and statistical representation of different operational characteristics of the managed network. These characteristics are represented with metrics (parameters that indicate the health and operational performance of the network). Althoug every report and reportlet opens with the default metric set, the Report Options Panel helps you generate the report or reportlet with the metrics of your choice.

Change the Default Settings for Reportlets

Reportlets display quick impressions of larger reports using the iSPI Performance for Metrics dashboards. They consist of metrics (parameters that indicate the health and operational performance of the network).

NPS generates reportlets with a set of parameters, which are set when you launch a reportlet from the NPS home page. Every NPS reportlet is built with a set of parameters that is available in the Report Options panel.

Every reportlet opens with a default metric set. To select a new metric, click  **Show Toolbar** and  **Options**.

Change Report Options

The Options panel enables you to:

- Customize the report with additional options that vary for each report type.
- Select the metrics that are displayed on the report.

To change the report options:

1. Launch the report from the NPS navigation panel.
2. Click **Options**.

   The Report Options panel for the report opens.
3. You can change the following settings:
   - **Metrics**: *Available only with Top N, Top N Chart, and Most Changed reports.* A report displays the metric, performance, or utilization associated with the monitored element. Most reports open with the data for a default set of metrics.

     To change the default metrics, use the Selected Metric(s) field.

     To display only specific metric values, click **Apply Filter**.
   - **Grouping By**: *Available only with select reports.* In the Grouping By box, select an attribute to define the grouping mechanism for the tabular data on the report.
     - To select more than one attribute, click **Add New Metric**. A new Grouping By box with the list of attributes appears.
     - To remove a grouping attribute, click **Remove Metric**.
     - To display or hide the start date, start time, or display grain for the report data, click **Apply Filter**.
   - **Top/Bottom N**: *Available only with the Top N and Most Changed reports.* The Top/Bottom N option helps you specify the number and order of data points for use with the Top N and Most Changed reports.
   - **Display Time Series Chart**: *Available only with the Top N report.* The Display Time Series Chart option enables you to view the time series chart at the bottom of the Top N report.
4. Click **Confirm Selection**. The modified report appears.

NPS preserves your choice of metrics for a report. When you come back to the report in the future, the metrics you selected the last time are automatically used as the default metrics.

Change Reportlet Options

The Options panel enables you to:

- Customize the reportlet with additional options that vary for each reportlet type.
- Select the metrics that are displayed on the reportlet.

To change the reportlet options:

1. Launch the reportlet from the NPS navigation panel.
2. Click **Show Toolbar**.
3. Click **Options**.

   The Report Options panel for the reportlet opens.
4. You can change the following settings:

- **Metrics**: *Available only with select reportlets.* A reportlet displays the metric, performance, or utilization associated with the monitored element. Most reportlets open with the data for a default set of metrics.

  To change the default metrics, use the Metric field.

  To display only specific metric values, click **Apply Filter**.

- **Grouping By**: *Available only with select reportlets.* In the Grouping By box, select an attribute to define the grouping mechanism for the tabular data on the reportlet.

  - To select more than one attribute, click **Add New Metric**. A new Grouping By box with the list of attributes appears.
  - To remove a grouping attribute, click **Remove Metric**.
  - To display or hide the start date, start time, or display grain for the report data, click **Apply Filter**.

- **Top/Bottom N:***Available only with select reportlets.* The Top/Bottom N option helps you specify the number and order of data points for use with the Top N and Most Changed reports.

5. Click **Confirm Selection**. The modified reportlet appears.

NPS preserves your choice of metrics for a reportlet. When you come back to the reportlet in the future, the metrics you selected the last time are automatically used as the default metrics.

Select a Topology Group

NPS generates reports based on topology filters and metrics. Topology filters generate reports on network elements with specific topology attributes, and display data polled from selected network elements. Metrics determine the health and performance of the selected topology elements.

The Preferences paneprovides the following topology group tracking methods:

- SCD Type1, which applies to data for which historical changes are not saved. For example, you could create a new group and use it to filter data you collected previously (prior to forming the group).
- SCD Type 2, which applies to data for which the historical changes are saved. This allows you to keep track of the interfaces and nodes that are a member of group at a certain point in time and see the reported data.

SCD (Slowly Changing Dimensions) is a term borrowed from data warehousing concepts and refers to dimensions that have data that changes slowly rather than on a regular time-based schedule.

You can define a group of topology elements and be able to look at data that was collected even before the group existed. The data for this group would be based on current group contents. In such case, you would select Type 1 as your filter.

Or you can monitor the statistics for a group of topology elements such that when the elements of the group change over time, the collected historical data is not updated to reflect the current contents of the group. You would select Type 2 as your filter.

Example

The connectivity between the routers in Site A has been suffering from a high data loss percentage for the past week. You decide to check the routers with the highest volume of incoming and outgoing traffic in this location. You create a node group for the routers in Site A and generate the Top N Report to see the list of routers with the highest volume of data. However, if you use the traditional NodeGroup Name filter to apply the node group you created today, you cannot filter older data. This means, using the default NodeGroup Name filter, you cannot display data older than the node group.

To resolve this, you can use the SCD Type 1 filter. Type 1 groups apply the most recent group definition to all the historical data. In other words, reports generated based on Type 1 topology groups display all data that matches the most recent definition of the group irrespective of the age of the data. In this example, the report, when generated based on Type 1 node group, would display past one week's data.

To select the Type 1 topology group:

1. Log in to NPS from either the NNMi console or the NPS home page.
2. In the navigation panel, click **Reports** and select the report you want to view.
3. On the navigation panel, click **Topology Filters**.
4. Select a Type 1 group. For example, to select a Type 1 interface group, select an interface group for the InterfaceGroup_Type1 Name topology filter. Do one of the following for the topology attributes you want to filter:
   - To select just one value for a topology attribute, click **Single Value Select**, and select a topology filter.
   - To select multiple values, click **Multi value select** and the topology filters (by using **Ctrl-click** or **Ctrl+Shift**).
   - To search and select a value from a list of values, click **Search and select**.

   When launching reports from NNMi with a NodeGroup or InterfaceGroup selected, the default behavior is to continue to use the traditional (Type2) "NodeGroup Name" or "InterfaceGroup Name" filters in NPS. If, however, you use the Type1 filters, you can use the Topology Filters page to clear the existing filters and apply the "NodeGroup_Type1 name" or "InterfaceGroup_ Type1 Name" filters instead. The Type1 groups are also available in the Top-N reports as an element group-by option.
5. To apply different types of topology filters, click **Apply** and repeat step 3.

   Clicking the Apply button suppresses the values from the other topology attributes that are irrelevant for your selection.

   To discard your selection, click **Reset**.
6. Click **Confirm Selection**. NPS generates the report based on the specified topology attributes.

Cookies are used to preserve your preferred method of selecting each topology filter. For example, if you open a single value selector for an attribute, the single-valued selector will already be open the next time you run a report. Avoid opening more selectors than you routinely need because they add overhead (extra time) to running the report.

Topology Group Tracking Method

Previous versions of the NNM iSPI Performance were designed to handle topology group changes using the methodology known as Slowly Changing Dimensions (SCD) Type 2. Essentially, this means that when you monitor the statistics associated with a collection of topology elements, if the actual elements of that group change over time (add more nodes, delete some nodes. etc.), the collected historical data does not get updated to reflect the current contents. This is the most historically accurate way to track dimensional changes over time.

You can, however, define a group of topology elements and look at the historical data for the group as a whole immediately, and look at data collected before the group existed. The data presented for a group is based on the current group contents at the time the report is requested. This methodology for tracking data associated with dimensional groups is known as SCD Type 1.

The terms SCD Type 1 and SCD Type 2 are borrowed from established data warehousing and business intelligence concepts.

You can select the grouping type you prefer at any particular time. The system remembers your choice so you do not have to set the value when you generate a report.

The navigation panel enables you to select either SCD Type 1 or SCD Type 2 as your topology grouping method. Your selection is applied when you select a topology-based group (such as Node Group or Interface Group) as a filter in your report.

The default selection is SCD Type 1 upon first use. Once you select a preference, your selection becomes the default. Making a selection has no effect until you also choose a topology group to filter your report.

You can make topology filtering selections in several ways. You can launch from NNM with a group already selected. Or you could launch the Topology Selector form from within the navigation panel. This same form is included as a prompt page for every report. The top of the form includes a drop-down that enables you to change your topology group tracking method.

Changing the value in the drop-down automatically updates the navigation panel preference setting. Once your selection is applied, the filter display of all reports shows both the topology group and the SCD type value in use.

Also see Select a Topology Group

Set Topology Filters

NPS generates reports created from different metrics that are polled from different nodes, interfaces, and other network elements. You can use the Topology Filters feature to modify the report to contain data polled from network elements you select. Topology filters enable you to filter and generate reports with specific topology attributes.

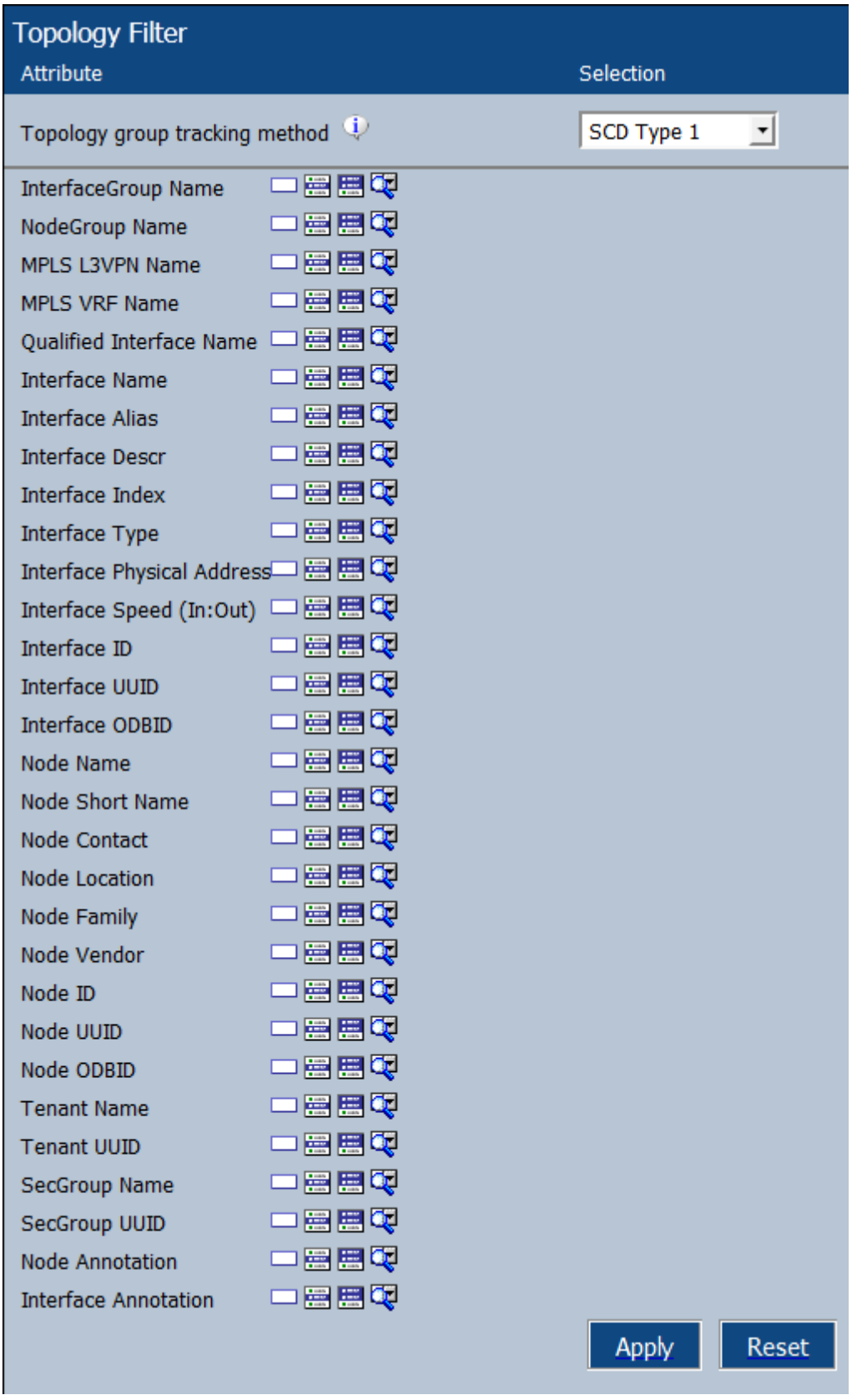
All topology attributes are obtained from NNMi or the collectors and pollers of the iSPIs in use. You cannot add new attributes or delete existing attributes.

By default, NPS preserves the historical integrity of topology data. Any changes made to topology attributes (Interface Speed, ifAlias values, and so on) are not retroactively applied to the existing historical data, but only to new data.

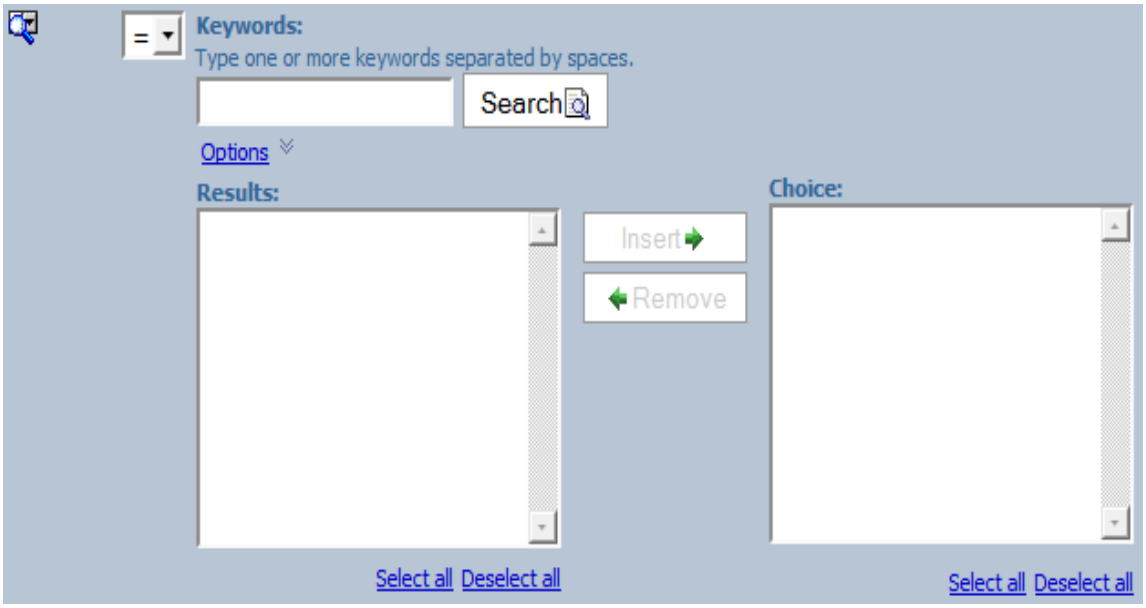
To use topology filters:

1. Log in to NPS from either the NNMi console or the NPS home page.
2. In the navigation panel, open the **Reports** tab and select the report you want to view.

   To modify the topology filters for one of the most used reports, select a report from the **My Folders** location. For more information on how to save a report into the My Folders location, see "Save a Report into My Folder" (on page 75).
3. In the navigation panel, open the **Topology Filter** tab and click **Launch Topology Selector**.


Topology Filter
Attribute
Selection
Topology group tracking method
SCD Type 1
InterfaceGroup Name
NodeGroup Name
MPLS L3VPN Name
MPLS VRF Name
Qualified Interface Name
Interface Name
Interface Alias
Interface Descr
Interface Index
Interface Type
Interface Physical Address
Interface Speed (In:Out)
Interface ID
Interface UUID
Interface ODBID
Node Name
Node Short Name
Node Contact
Node Location
Node Family
Node Vendor
Node ID
Node UUID
Node ODBID
Tenant Name
Tenant UUID
SecGroup Name
SecGroup UUID
Node Annotation
Interface Annotation
Apply
Reset

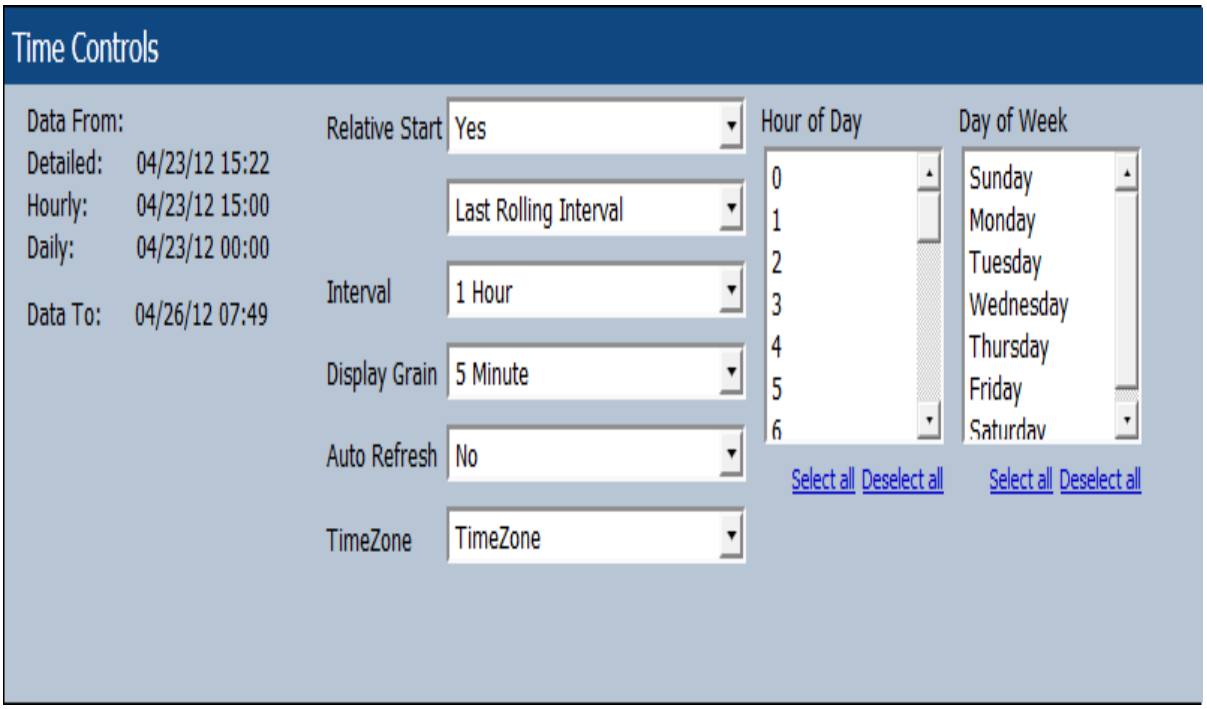
4. Do one of the following for the topology attributes you want to filter:
   - To select just one value for a topology attribute, click **Single value select**, and select a value from the drop-down list.
   - To select multiple values, click **Multi value select**, and select the values from the drop-down list. You can click, Shift+click, Ctrl+click, click Select all, or click Deselect all.
   - To search and select a value from a list of values, click **Search and select**. The search dialog opens.



5. To apply different types of topology filters, click **Apply** (which will suppress the values that are irrelevant) and repeat step 3.

   To discard your selection, click **Reset**.

6. Click **Next >** to open the Time Controls dialog.



Or

7. Click **Finish** to generate your report.

Cookies are used to preserve your preferred method of selecting each topology filter. For example, if you open a single value selector for an attribute, the next time you run a report, the single value selector will already be open. Be aware that opening more selectors adds extra time to running the report.

The Self Diagnostic tab displays reports on different NPS processes with the data collected from NPS. Therefore, you cannot see any node or interface-related attributes in the Topology Filters section of any Self Diagnostic reports.

You can also exclude selected objects from the report.

Time Ranges with Default Display Grains

When you set a time range for a report, a predefined display grain is applied to the report. The following table shows the mapping between the time ranges with the default display grains.

Time Range	Display Grain
31 Days	1 Day
7 Days	1 Day
24 Hours	1 Hour
12 Hours	1/2 Hour
2 Hours	5 Minutes

Time Range	Display Grain
1 Hour	5 Minutes
30 Minutes	1 Minute
15 Minutes	1 Minute
5 Minutes	As Polled
1 Minute	As Polled
Until Now	Adjusted appropriately based on Start Date/Time

Your choice of display grain defines the data source for the reports.

The following types of data sources exist within NPS:

- Internal Summary tables (data for up to 70 days)
- Internal Live tables (data for up to 1 day)
- Archive tables (data for up to 'N' days as set by the Configuration Utility)

Using a display grain of 1 hour or more ensures that your reports will source their data from the Internal Summary tables. A display grain of less than 1 hour, combined with a Start Date/Time within the last day, will result in the Live tables being used. A display grain of less than 1 hour, combined with a Start Date Time prior to the last day, will force NPS to use the Archive tables to fulfill the query. In this last case, a warning message will notify you that the report might be relatively slower because it must perform a more time-consuming database query to retrieve the data.

Special Scenarios

- *Start Date/Time and Time Range extend beyond the available data*: The Start Date and Time automatically shift to allow the requested Time Range to be selected from the available data set.

- *Start Date/Time requested is prior to the oldest data*: If you request a Start Date/Time that is prior to the oldest data in the NPS, the Start Date and Time shift to coincide with the oldest data available. The Time Controls section notifies you of this after you make the selection.
- *Start Date/Time is not on the boundary of the display grain*: Graphs and charts always show data grouped into sample sets, with the sample size defined by the display grain. The display grain defines how samples of data are grouped across the time range. For example, a 1-hour chart with a display grain of 5 minutes displays 12 samples of data. If the Start Date/Time is not on the boundary of a display grain-sized sample, results can look unusual. The NPS always attempts to round down the Start Date/Time to the beginning of the nearest display grain-sized sample.

For example, a Start Time of 12:15 a.m. and a Time Range of 1 Day will have a default Time Grain of 1 Hour, resulting in 24 samples. However, the samples for the hour representing 12:00 will only have data from 45 minutes and will appear unusually low. To correct this, the Time Control will move the Start Date/Time back to begin at 12:00 a.m. automatically.

Related Topics

Change the Default Settings for Reports

Time Ranges with Default Display Grains

Time Changes and Time Zones

Semi-annual clock changes

If you turn clocks back one hour, statistics for one hour are recorded twice, once before the time change, and once immediately after. Collecting statistics twice for the same hour doubles the number of counts (volume in bytes, volume in packets) and the number of samples aggregated into an average. If you turn clocks ahead one hour, a gap occurs because no samples are collectable for the missing hour. Counts for that hour are zero, and counts for the whole day are artificially low.

Time zones

NNM marks performance data with a universal time stamp known as **seconds since epoch**. NPS converts NNM's universal time stamp into local time, as defined by the location of NPS. From the perspective of a user in a different time zone, NPS data is out of sync with the local time.

If NPS and the NNMi management server are running on separate systems, make sure that the system clocks match. Otherwise, confusion will arise as you move from one application to the other.

Change the Default Date and Time for Reports

To change the default date and time for reports:

1. Log in to NPS from either the NNMi console or the NPS home page.
2. In the navigation panel, click **Reports** and select the report you want to view.

   To modify the topology filters for one of the most used reports, select a report from the **My Folders** location. For more information on how to save a report into My Folders location, see Saving a Report into My Folder.
3. In the navigation panel, click **Hour / Day Filters**.
4. Select the following:
   - In the Hour of Day list, select a default time for the reports.
   - In the Day of Week list, select a default date for the reports.
5. Click **Submit**.

To cancel the selection, click **Reset**.

Change the Default Time Zone for Reports

By default, reports are generated according to NPS's time zone. You can select a different time zone while viewing or scheduling a report in the Time Zone field.

NPS uses the selected time zone to generate all subsequent reports.

The selected time zone overrides the time zone preferences associated with your user account. If you set the time zone back to the default value, NPS uses the following time zones:

- **The time zone set in your user account preferences**

  This overrides the NPS time zone. To change the default time zone, see Change the Report Time Zone with the Time Control Tab

- **The time zone used by NPS**

  If you did not set any preference for time zone in your user account, NPS uses this option.

The Filter Summary ( ) of each report displays the selected time zone unless the effective time zone is the default NPS server time zone, known as "Server Time."

Select the default time zone if you generate reports in a large scale environment. Selecting a different time zone than Server Time requires NPS to convert the time stamps for the selected time zone while generating the report. This can consume a lot of time.

Change the Report Time Zone with the Time Control Tab

To specify a preferred time zone:

1. Log in to NPS as Administrator.
2. Click **Reports** tab, select an Extension Pack, and select a report to apply the time zone.
3. In the navigation panel, click the **Time Control** tab.
4. In the Time Zone field, select a time zone.
5. Click **Submit**.

Keep in mind the following before changing the time zone.

- Semi-Annual Clock Changes

  If you turn clocks back 1 hour, NPS records the metrics for that hour twice, once before the time change, and once immediately after the time change. Collecting statistics twice for the same hour doubles the number of counts (volume in bytes, volume in packets) and the number of samples aggregated into an average.

  But if you turn clocks ahead 1 hour, a gap of an hour occurs in the records because NPS does not collect any data sample for the missing hour. Counts for that hour will be zero, and counts for the whole day will be artificially low.

- Time Zones

  NNMi marks performance data with a universal time stamp known as "seconds since epoch." NPS converts NNMi's universal time stamp into local time, as defined by the time zone selected for NPS. From the perspective of a user in a different time zone, NPS data will be out of sync with the local time.

  If NPS and the NNMi management servers are running on separate systems, the system clocks must match.

Change the Display Grain for Reports

The Time Grain defines how samples of data are grouped across the Time Range.

A 1 hour chart with a Time Grain of 5 minutes displays 12 samples of data. Adjusting the time range automatically sets the Time Grain to a default value. You can adjust the Time Grain manually using the navigation panel on the NPS home page.

To avoid partial samples of data being grouped together, NPS adjusts the Start Date/Time value to the boundary of the default time range.

To change the default time grain for the reports:

1. Log in to NPS from either the NNMi console or the NPS home page.
2. In the navigation panel, click **Reports** and select the report you want to view.
3. In the navigation panel, select **Time Control**.
4. In the Grain section, select a time grain for your report.
5. Click **Submit**.

Your selection of Time Grain defines the data source for the reports. NPS uses the following types of data source:

- Internal Aggregate tables

  Using a course time grain (1 hour or more) ensures that your reports will source their data from the internal Aggregate tables.

- Internal Live tables

  Using a fine time grain (less than 1 hour) requires NPS to analyze the volume of live data in the database and set the table type accordingly.

  If the start time requested is before the earliest live data, NPS uses the internal aggregate table as the data source. Otherwise, NPS uses the internal live table as the data source.

- Archive tables

Change the Start Date or Time for Reports

The report shows the data collected from the time and date specified in the Time Control section.

To change the start date or time for a report:

1. Log in to NPS from either the NNMi console or the NPS home page.
2. In the navigation panel, click **Reports** and select the report you want to view.
3. In the navigation panel, select **Time Control**.
4. In the Relative Start field, select **No**.
5. In the Start Date/Time section, click on the **Date** box, and select the appropriate date.
6. In the Start Date/Time section, click on the **Time** box, and select the appropriate time.
7. Click **Submit**

NPS adjusts the Start Date/Time automatically under the following circumstances:

- **Start Date/Time and Time Range extend beyond the available data**.

  NPS moves back the Start Date/Time and selects the requested *Time Range* from the currently available data set.

- **Start Date/Time requested is prior to the oldest data**.

  If your request for a Start Date/Time is prior to the oldest data in the system, NPS advances the Start Date/Time to coincide with the oldest data available. The Time Control advises you of this when your data set begins.

- **Start Date/Time is not on the boundary of the Time Grain**.

  NPS reports always show data grouped into sample sets. The sample size is defined by the Time Grain. If the Start Date/Time is not on the boundary of a Time Grain sized sample, results can look unusual when displayed. To prevent this, the Time Control always attempts to round down the Start Date/Time to the beginning of the nearest Time Grain sized sample.

  For example, a Start Time of 12:15 a.m. and an Interval of 24 Hours has a default Time Grain of 1 Hour, resulting in 24 samples. However, the samples for the hour representing 12:00 only have data from 45 minutes and will appear unusually low. To correct this, the Time Control moves the Start Date/Time back to begin at 12:00 a.m. automatically.

Change the End Date or Time for Reports

The report shows the data collected from the start time until the date specified in the Time Control tab.

To change the end date or time for a report:

1. Log in to NPS from either the NNMi console or the NPS home page.
2. In the navigation panel, click **Reports** and select the report you want to view.
3. In the navigation panel, select **Time Control**.
4. In the Relative Start field, select **No**.
5. In the End Date/Time section, click on the **Date** box, and select the appropriate date.
6. In the End Date/Time section, click on the **Time** box, and select the appropriate time.
7. Click **Submit** to generate the report for the time range ending on the date and time specified in the End Date/Time.

NPS adjusts the Start Date/Time automatically under the following circumstances:

- **End Date/Time and Time Range extends beyond the available data**.

  NPS moves back the End Date/Time and selects the requested Time Range from the currently available data set.

- **Time Range requested is prior to the oldest data**.

  If you request a time range (time between the Start Date/Time and End Date/Time) that is prior to the oldest data in the system, NPS advances the Start Date/Time and End Date/Time to coincide with the oldest data available.

  The Time Control advises you of this when your data set begins.

Change the Time Range (Interval) for Reports

The time ranges fall into the following categories:

- **Fixed Period Length relative to the most recent sample stored in the system until now**

  To select this type of time range:

  a. Log in to NPS from either the NNMi console or the NPS home page.

  b. In the navigation panel, click **Reports** and select the report you want to view.

  c. In the navigation panel, select **Time Control**.

  d. In the Relative Start section, select **Yes**. If you select a Time Range that is relative to the most recent data (for example, Last 1 Hour), NPS modifies the Start Date/Time accordingly.

- **Fixed Period Length starting at the given Start Date/Time**

  You can select a time range applicable to a specific start and end date/time.

  If you select a time range that would push the start date earlier than the available data sample, NPS automatically adjusts the time range to set the start date/time at the earliest data record.

  - To select the start date or time, see Change the Start Date or Time for the Report.
  - To select the end date or time, see Change the End Date or Time for the Report.

Selecting a Time Range automatically sets the Time Grain to an appropriate value. You can change the display grain manually.

Too many data points on a chart can make the results difficult to read.

Change Settings before Launching a Report

Sometimes the default options for running a report are suitable, but you can also modify the time selections, topology filters, and report-specific options before running a report. Where appropriate, reports include up to three separate prompt pages, which are used to supply specific values in the three areas. The prompt pages are used when scheduling a report for automatic execution and are also available when you want to configure the report with specific options prior to launching through the navigation panel. The pages are:

- Time
- Topology
- Report-specific options such as the display of charts or metric choices

Within the navigation panel, left-clicking on a report in the tree will simply launch the report with whatever choices are already in place. Right-clicking provides other choices, one of which is "Run with prompts." This choice will guide you through the embedded prompt pages and then run the report.

Refresh Report Data Automatically

The report is automatically refreshed with the fresh data samples if you select the auto refresh rate with a relative start date and time.

For example, if you selected Last 1 Hour as the Time Range, and 1 Minute in the Auto Refresh field, the report displays the data samples collected in the past hour and refreshes the data every minute.

As a result, if you generated the report at 12:00 p.m., the report shows data from 11:00 a.m. to 12:00 p.m., and refreshes the report data at 12:01 p.m.

To automatically refresh the report data:

1. Log in to NPS from either the NNMi console or the NPS home page.
2. In the navigation panel, click **Reports** and select the report you want to view.
3. In the navigation panel, select **Time Control**.
4. In the Relative Start field, select **Yes**. By default, relative start is set to Yes.
5. Select the check box **Auto Refresh**. By default, auto refresh is set to No.
6. Click **Submit**

Select a Relative Start for Reports

The Start Date/Time defines the point of origin of the report. The report shows the data collected from the time and date specified in the Start Date/Time field.

To set relative start for your report:

1. Log in to NPS using either the NNMi console or the NPS home page.
2. In the navigation panel, click **Reports** and select the report you want to view.
3. Open the **Time Control** pane.
4. In the Relative Start field, select **Yes**. By default, relative start is set to Yes.
5. In the Last field, select a time range for the report. For example, to generate a report based on the last 31 days data, select 31 days in the Last field.
6. Select a different time grain if required.
7. Click **Submit**.

If you request a time range that is relative to the most recent sample of data, NPS moves the Start Date/Time appropriately. In some cases, especially with a very recent installation, this can result in a Start Date/Time that appears to be older than the start of the first data collection interval.

Adjust Time

The adjust time buttons have the following function:

Icon	Description
	**Adjust time - zoom in**. Enables you to view data points in a smaller time period.
	**Adjust time - zoom out**. Enables you to reset and view the original data.
	**Adjust time - back**. Enables you to view a previous time period.
	**Adjust time - forward**. Enables you to select a future time period.

Reportlet Controls

The Dashboard Reportlet page enables you to modify the reportlet properties using the following tools.

Filter Control	Description
	Displays or hides the reportlet control toolbar
	Displays or hides the following information: • Start date for the data displayed • Start time for the data displayed • Display grain for the data displayed
	Displays or hides the Report Options panel.
	Displays or hides the Add Bookmark panel.

Contextual Navigation

NPS adds contextual links on the report content to navigate to related reports. By clicking a hyperlink on the report, you can navigate to related reports with the context of the original report.

The following report types and contextual navigation are available.

Report Type	Contextual Navigation Point
Calendar	**X-axis**: Opens report links for reports with the same Date/time context and the same primary metric.
Chart Detail	**X-axis**: Opens report links for reports with the same Date/time context and the same primary metric.
Heat Chart	**Hour of Day Row Header**: Opens report links for reports with the same Hour of Day filter of the selected row. **Day of Month Header**: Opens report links for reports with the same Date/Time filter of the selected row. **Data cell value**: Opens report links for reports with the same Hour of Day filter of the selected row and same Date/Time filter of the selected date.
Headline	**X-axis**: Opens report links for reports with the same Date/Time context and same metric.
Dashboard	**Interface name from the Top 10 utilization, Response Time, or Discard charts**: Opens report links for reports with the same topology filter to selected interface and the same metric. **Needles of the Exception Count gauges**: Opens report links for reports with the same metric.

Top N	**Object name** (for example, interface name or node name): Opens report links for reports with the same topology filter.
Most Changed	**Object name** (for example, interface name or node name): Opens report links for reports with the same topology filter.

You can launch a report from the same Extension Pack tab, or from a different one. If you launch a report from a different Extension Pack tab, only the relevant topology filters are preserved. Because metrics vary between Extension Packs, the selected metric cannot be transferred to the target report.

Cross Launch a Report

Where appropriate, the report or reportlet presents links to navigate to another related report or reportlet. This feature enables you to refine your selection based on time, topology, or metrics displayed on the report.

To cross launch a report or reportlet:

1. Click the data point in the report or reportlet that launches another report or reportlet.

   For example, click a point of time in the X axis of the Chart Detail report to drill down to the Heat Chart report displaying the metric performance for the hour selected. Or, open the Top N report to see the list of devices contributing most to the data at that interval.

   You can set your browser to open either a new window or a new tab when you drill down. This enables you to revisit the initial report and examine another data point at a later time.

2. Select the metrics for the drill-through report or reportlet.

   NPS saves your selection for the next session.

3. Select a report or reportlet from the navigation panel. The new report or reportlet displays the selected metric.

   For more information on the contextual navigation available for each report type, see Contextual Navigation.

Examples

- The Dashboard report for Interface Health shows a high availability exception count. Clicking the needle of the gauge launches the Report Menu with Availability Exceptions as the primary metric. You can then launch the Top N report to find which set of nodes is causing the availability exceptions.
- Looking at the Top N interfaces and their network discard figures, one interface seems more problematic than usual. Clicking the interface name launches the Report Menu with that interface as a topology filter. You can then launch the Chart Detail report to examine discard figures over the selected time interval for just that interface and determine when the problem started.
- Using the Heat Chart report for Interface Health shows a peak in traffic on one particular day. Clicking the cell with the high value launches the Report Menu with that day already selected. You can then launch the Interface Health Headline report and get an overview of multiple metrics for each hour during that day.

Create Bookmarks in Reports

NPS enables you to create bookmarks for reports in the NPS home page.

These bookmarks encapsulate all the selected settings (Time, filters, Options) and enable you to quickly visit the report again from your browser.

Bookmarks are convenient for emailing and sharing reports.

To have the bookmark open the report within the same time range as the original report, select a non-relative time range; for example, Start Date/Time with "1 Hour" and not "Last 1 hour" as the time range. Otherwise, the report will show the most recent data.

To create a bookmark for a report:

1. Launch a report.
2. Click **Show Bookmark**. A URL appears.

   Do the following:

   - *Only for Microsoft Internet Explorer*: Click **Add Bookmark**. A bookmark to the report is automatically added to the browser with a new entry to the Favorites list.
   - *Only for Mozilla Firefox*: To create a new bookmark by using the displayed URL, right-click the URL and select **Bookmark This Link**.

The bookmarked URL retains all the properties of the report.

Create Bookmarks in Reportlets

NPS enables you to create bookmarks for reportlets in the NPS home page.

These bookmarks encapsulate all the selected settings (Time, filters, Options) and enable you to quickly visit the reportlet again from your browser.

Bookmarks are convenient for emailing and sharing reportlets.

If you want the bookmark to open the reportlet within the same time range as the original reportlet, select a non-relative time range; for example, Start Date/Time with '1 Hour' and not 'Last 1 hour' as the time range. Otherwise, the reportlet will show the most recent data.

To create a bookmark for a reportlet:

1. Launch a reportlet.
2. Click **Show Toolbar** to display the reportlet toolbar.
3. Click **Show Bookmark**. A URL appears.

   Do the following:

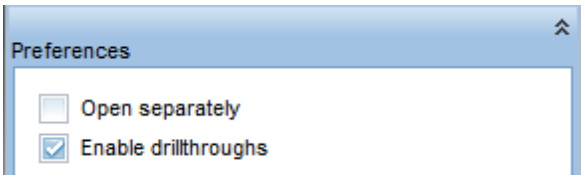
   - *Only for Microsoft Internet Explorer*: Click **Add Bookmark**. A bookmark to the reportlet is automatically added to the browser with a new entry to the Favorites list.
   - *Only for Mozilla Firefox*: Create a new bookmark by using the displayed URL.

The bookmarked URL retains all the properties of the reportlet.

Enable Drillthrough

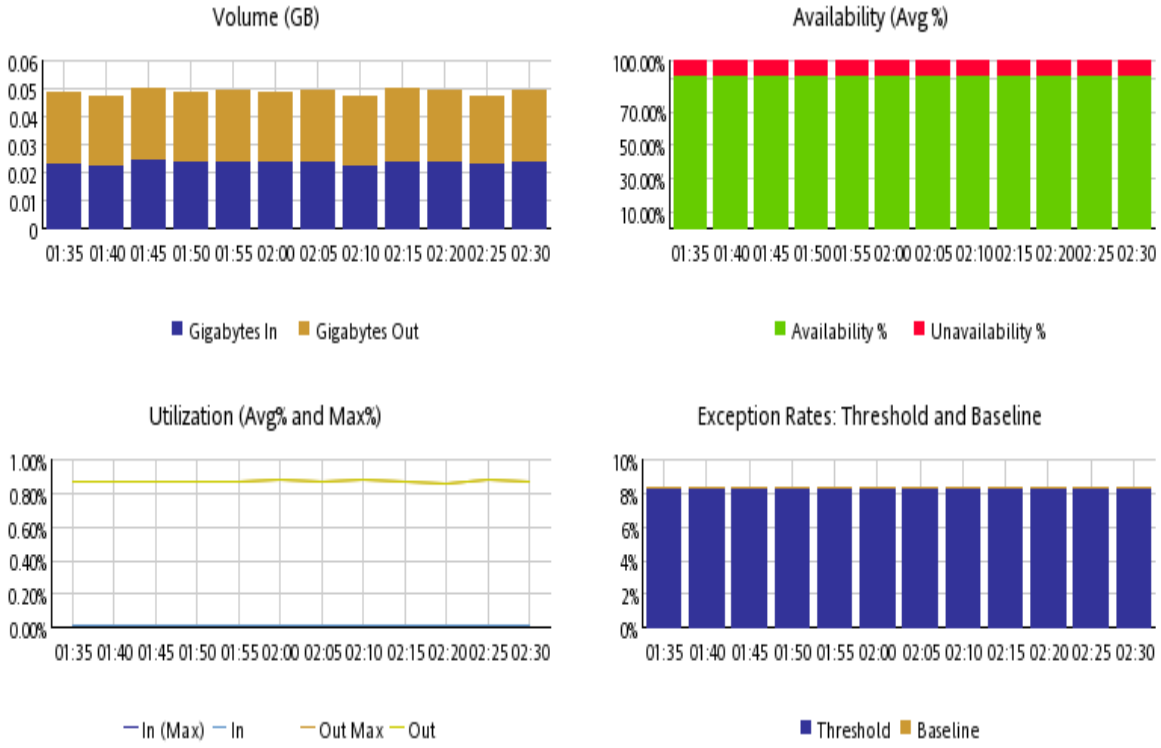
You can drill through reports to see more detail on elements you choose.

The Preferences tab of the navigation panel provides the option to automatically enable drillthrough on reports you plan to run.

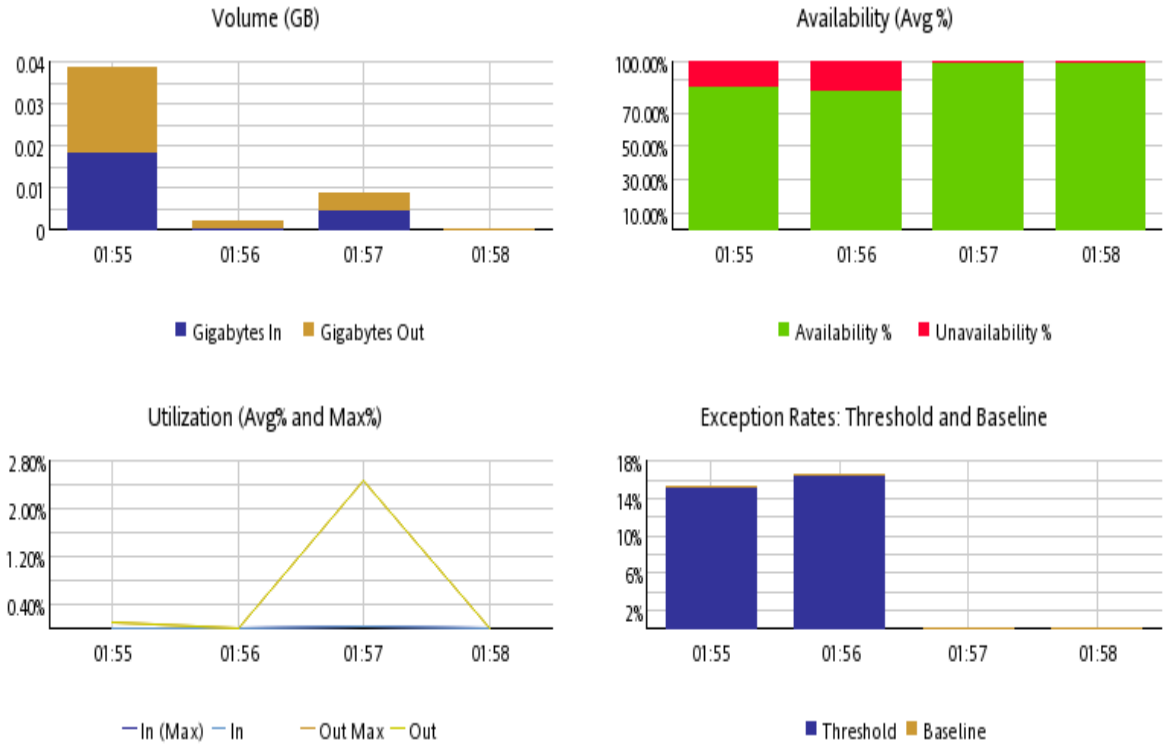


Or you can click the drillthrough icon for a report you already ran.

When drillthrough is enabled, you can click an area of interest within the report to get more details. For example, say that you clicked inside the following Volume graph at time 01:55.



The following detail would appear for that time period.



Add URL Actions in the NNMi Console

After you generate a bookmark, you can create a new Actions menu item with the newly generated bookmark, which enables you to launch a report or reportlet directly from the NNMi console.

To add URL actions in the NNMi console to launch a report or reportlet:

1. Generate the bookmark for the required report or reportlet.
2. In the NNMi console, select the Configuration workspace from the workspace navigation panel.
3. Select **User Interface**.
4. Select **Menu Items**.
5. Click **New**.

   The Menu Item form opens.
6. In the basics section of the Menu Item form, specify the following details:
   - Menu Item Label: The name of the report or reportlet you want to launch.
   - Unique Key: A unique identifier for the menu item. Type an identifier.

     You can use alpha-numeric and period (.) characters. Do not exceed 80 characters. Do not use spaces and underline characters. To make the value unique, use the Java name space

convention while specifying this value. Include the Menu Item Label value as part of the unique key; for example:

`com.<company_name>.nnm.menu.item.<menu_item_label>`

- Author: Specify the default value Customer, or click  to add a new author name; for example, NPS.
- Parent Menu: Retain the default value—Actions.
- Ordering: Specify an integer between 1 and 100. The lowest number appears at the top of the Actions menu. The highest number appears at the bottom of the Actions menu.
- Prepend Separator: Select this option to add a horizontal line before the report or reportlet menu item in the Actions menu.
- Enable: Select this option to use the report or reportlet bookmark.

7. Retain all other default settings in the Basics section.
8. In the Menu Item Context tab, click  **New**.

   The Menu Item Context form opens.
9. In the Basics section, click  and  **New Launch Action**.

   The Launch Actions form opens.
10. In the Launch Actions form, specify the following:
    - Name in the Name box
    - Bookmark URL in the Full URL section
11. Click  **Save and Close**.
12. Click  **Save and Close** in the Menu Item Context form.
13. Click  **Save and Close** in the Menu Item form.
14. Click  **Save and Close** in the User Interface Configuration form.

Now you can launch the report or reportlet from the Actions menu.

View a Report using Different Report Formats

NPS and the BI Server use web-based HTML as the default report format.

You can also view a report in Adobe PDF or Microsoft Excel formats.

To view a report in non-HTML format:

1. In the NNMi console, click **Actions** > **HP NNM iSPI Performance** > **Reporting - Report Menu**. The NPS home page opens.
2. On the navigation panel, select the **Reports** tab. NPS presents the Self Diagnostic reports for the default, ready-to-use Self Diagnostic Extension Pack. Depending on the number of the NNM iSPI products or Extension Packs available on the NPS system, you could see other report folders.

3. Under an Extension Pack, select a report.
4. In the Time Controls tab, select a time range for the report. For information on selecting the time range for a report, see Change Time Controls.
5. Click  **View in HTML Format**.
6. Select one of the following options:
   - **View in PDF Format**. A PDF version of the report appears in the same browser window.
   - **View in Excel Options** and **View in Excel 2007 Format**, **View in Excel 2002 Format**, or **View in Excel 2000 Single Sheet Format**.

Change Time Controls

When you launch a report from the NPS home page, the report shows the data collected over the selected time range relative to the most recent data sample.

To change time controls:

1. Log in to NPS from either the NNMi console or the NPS home page.
2. In the navigation panel, click the **Reports** tab, select the Extension Pack and the report you want to view.

   To modify the time controls for one of the most used reports, click **My reports**. For information about how to save a report into My Folders location, see Saving a Report into My Folder.
3. On the navigation panel, open the **Time Control**pane.
4. You can change the following parameters:

Time Control	Function
Relative Start	Sets the start date for the reports based on the available data
Adjust time	Adjusts the time
Interval	Changes the time range for the report
Grain	Changes the display grain for the report
TimeZone	Enables you to select a preferred time zone
Auto Refresh	Refreshes report data automatically
Hour of Day	Enables you to: ▪ Select the appropriate hour of the day from the list. ▪ For multiple selections, select the appropriate hour from the list, and then hold down CTRL to select each additional hour.
Day of Week	Enables you to: ▪ Select the appropriate day of the week from the list.

Time Control	Function
	▪ For multiple selections, select the appropriate day from the list, hold down CTRL to select each additional day.
Reset	Cancels the previous selection
Submit	

5. Do one of the following:
   - On the Report Options panel, click **Submit**.
   - Click **Confirm Selection**.

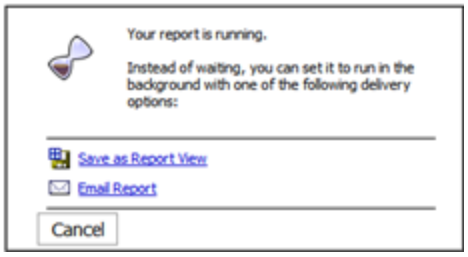
If you are viewing the Time Control pane while launching the report from within the BI Server connection, you might see additional navigation buttons at the bottom of the screen. These buttons enable you to move forward to the Topology Filters screen.

Button	Function
Cancel	Click to cancel the report generation
Back	Click to go back to the previous page of the report generation. If you are in the first page, the option will be disabled.
Next	Click to move to the next page of the report generation
Finish	Click to display the report for the selected filter.

Run a Report in Background

Some reports can take a long time to generate. You can run such reports in the background and have the output saved to a folder on the BI Server. You can also have it emailed.

If the report takes more than a few seconds to generate, a prompt will appear offering an alternate delivery method for your report.



If you choose Save as Report View, enter a name for the report and save to MyFolders or to another folder that allows you to save reports. You can then view the new ReportView at your convenience from the left-hand navigation panel.

If you choose email, enter the email fields.

Set Up the Email Server

To use the NPS console to email reports, you must run the configureBIEmailServer.ovpl script one time to configure the details for your email server.

When you run the script, any existing email server information will be overwritten.

Create Shortcuts to Commonly Used Reports

You can quickly launch reports from the navigation panel using shortcuts.

You can create a custom shortcut folder that contains a set of report views (Quicklaunch ReportView) with options you select.

To create a custom Quicklaunch ReportView:

1. Create a folder and name it anything you want; for example, My Quicklaunch ReportViews.
2. Launch a report with filters by clicking **Run with prompt**.
3. Create a ReportView by clicking **Keep this version** and **Save as Report View**, selecting **Select another location**, and selecting the folder you created.
4. Provide a name for the report view; for example, Top 10 Nodes by Volume in Last Day.
5. Repeat to create another Quicklaunch ReportView.

Save a Report into My Folder

To save a report in the My Folder location:

1. Log in to NPS from either the NNMi console or the NPS home page.
2. On the NPS home page, click the **BI Server** tab in the left navigation panel.
3. Click **Public Folders**, select an Extension Pack and the required report.
4. Click **Create a report view for this report**.
5. In the Specify a name and description-New Report View wizard form, click **Select My Folders** for the Location: section.
6. Click **Finish**.

Limit Access to Reports

The Administrator can manage access to reports that are run when a ReportView is created.

Access to such reports can be controlled in any of the following ways:

- Log in as the tenant before creating the ReportView.
- Create the ReportView as Administrator but delete the saved output.
- Apply tenant name filtering before saving the ReportView.

Create Custom Reports with Query Studio

You can create custom reports with metrics from all available Extension Packs. You can also combine metrics from all available Extension Packs while creating a custom report.

HP does not offer any support for custom reports.

To create a new report:

1. Log in to NPS as Administrator.
2. On the NPS home page, click the **BI Server** tab in the navigation panel.
3. Select **Query Studio**. The Select a package (Navigate) window opens.
4. Select a Public Folder.

   The options are:

   - iSPI Metrics
   - Self Monitoring (admin users only)
   - Standard ReportViews
   - User Groups

   For example, select iSPI Metrics.
5. Select an Extension Pack; for example, Interface_Health.

   The HP NNM iSPI Performance BI Query Studio window opens.

   The Query Studio window consists of a Menu panel; two toolbars (Standard and Style), either of which can be hidden; and the work area where you will see your report being built.
6. Click **Insert Data** in the Menu panel to list the query items for the Extension Pack you selected.

   For our Interface Health example, the options are:

   - d_Interface_Health_Time
   - d_InterfaceTopology
   - g_InterfaceGroup Type1_InterfaceTopology
   - g_InterfaceGroup Type2_InterfaceTopology
   - g_NodeGroup Type1_InterfaceTopology
   - g_NodeGroup Type2_InterfaceTopology
   - g_MPLS L3VPN Type1_InterfaceTopology
   - g_MPLS L3VPN Type2_InterfaceTopology
   - g_MPLS VRF Type1_InterfaceTopology
   - g_MPLS_VRF Type2_InterfaceTopology
   - f_Virtual_InterfaceMetrics
   - nnmdetails_Interface_Health
7. Select a time range as follows:

   a. Expand the time query item; for example, d_Interface_Health_Time.

   b. Right-click a time range—for example, Day (of Week)—and click **Insert** or drag it into the

work area.

The time range appears in a column in the work area. You can add more time ranges.

You can also add time dimension columns that will return relative time queries. For more instructions, see "Adding Relative Time Queries to Custom Reports with Query Studio" (on page 78).

To delete a time range from the work area, right-click the column for the time range, and click **Delete**.

8. Select a topology group as follows:
   a. Expand the InterfaceTopology query item; for example, d_InterfaceTopology.

      NPS displays only the topology groups associated with your security group.

   b. Right-click a topology group and click **Insert**.

      The attribute appears in a column in the work area.

      To display meaningful data in the report, select a topology group relevant to the metrics you plan to select.

      To delete an attribute from the work area, right-click the column for the attribute and click **Delete**.

      Node groups and interface groups are separate items in the menu. To select a node or interface group, repeat the previous steps.
9. Add a topology context as follows:
   a. Expand an InterfaceGroup or NodeGroup query item.
   b. Right-click a group and click **Insert**.

   The group will be added to your report.

   To delete an attribute from the work area, right-click the column for the attribute and click **Delete**.

   NPS displays all topology attributes from all installed Extension Packs. However, not all topology attributes are applicable to metrics from all Extension Packs. If you point the mouse arrow over a topology attribute, a tool tip shows the Extension Packs that support that attribute.
10. Select a metric for the report as follows:
    a. Expand the f_Virtual_InterfaceMetrics query item.
    b. Right-click a metric click **Insert**. The metric will appear in your report.

    To delete a metric from the work area, right-click the column for the metric and click **Delete**.
11. Format the report with the style toolbar.
12. To give your report a title:
    a. Click **Title**. The Edit title area window opens.
    b. Enter a title and, if you want, a subtitle.

c. Click **OK**.

13. To run the report, click **Run Report** in the Menu navigation panel. You will be prompted to enter a TimeZone. Enter the same value you selected when you performed the Insert Data steps.
14. To save the report, click **Manage File** in the Menu navigation panel. Select the **Save As...** option.

    Make sure to save it in My Folder or another location. Do not save any reports made using Query Studio in any of the Extension Pack folders.
15. You can view the report when you log in to the iSPI Performance BI Server Portal.

You should avoid using Cognos BI Report Studio to create or customize reports. This is because support for such reports is not available.

For more information on using Query Studio, see the following BI Server documents:

- *Query Studio Quick Tour*
- *Query Studio User Guide*

Adding Relative Time Queries to Custom Reports with Query Studio

You can add time dimension columns to your custom report that will return relative time queries. The Date/Time dimension column provides the following time grain options:

- Month
- Week
- Day (of Month)
- Day (of Week)
- Day
- Hour (of Day)
- Hour
- Hour (epoch)
- Half Hour (of Day)
- Half Hour
- Qtr Hour (of Day)
- Qtr Hour
- 10 Minute (of Day)
- 10 Minute
- 5 Minute (of Day)
- 5 Minute
- Minute
- Minute (epoch)
- Previous Month

- Previous Day
- Previous Hour
- Previous
- This Week
- This Day
- This Hour
- This Minute

For example, you could build a report that calculates the difference between Week and This Week.

1. Launch Query Studio, select the Interface Health ExtensionPack and expand the f_Virtual_ InterfaceMetrics folder.
2. Select the options Week and This Week and drag them into the work area.
3. To calculate the data, press **Ctrl** and click both column headings.
4. Click the Calculate button. The Calculate dialog opens.
5. In the Operation box, select - (difference in days). The options are:
   - - (subtraction)
   - - (difference in days)
   - - (difference in months)
   - - (difference in years)
   - Add days
   - Add months
   - Add years
   - Earliest
   - Latest
   - Year
   - Month (number)
   - Week
   - Day
6. Under **Order**, select **Days between(Week, This Week)** and click **Insert**. A new column, Days between(Week, This Week) is added to the report.
7. Click the new column and click the Filter button. The Filter dialog opens.
8. Under **From**, enter 0, which represents "this week."

   Under **To**, enter 7, which represents "last week."

   A range can also be entered; for example, 0-7.

Click **OK**.

The value is calculated.

You can add more columns to this report. For example, you could add a measure such as Utilization (pctile95). And you can delete columns until the report reflects the information you need.

Launch Performance Troubleshooting for a Selected Node or Interface

The NNMi performance analysis panel displays graphs that provide data about connections, nodes, and interfaces in your system.

To use this feature:

- Select a performance-polled node from the NNM node inventory view. Click **Actions** > **HP NNM iSPI for Performance** > **Performance Troubleshooting**. The feature is launched for only the selected node.

  All the interfaces of the node are also available.

- Select a performance-polled interface from the NNM node inventory view. Click **Actions** > **HP NNM iSPI for Performance** > **Performance Troubleshooting**. The feature is launched for the selected interface.

  The interface appears under the parent node in the tree. All other interfaces of the node are also visible.

If the interface is not being polled, the panel is blank.

How to Find Data for a Connection in the NNMi Analysis Panel

You can find data for NNMi L2 connections through the performance analysis panel.

To use this feature, select an interface in a view in the NNMi console.

Graphs show data captured for the interfaces that comprise the endpoints of the connection over the past day.

You can adjust the time period shown by clicking the arrow on the top right-hand side. This opens the time navigation panel. Any change you make is reflected in all of the graphs.

The following graphs are provided:

Graph 1:

- Availability (avg)

Graph 2:

- Utilization In (avg)
- Utilization Out (avg)
- Utilization (avg)

Graph 3:

- Error Rate (avg)
- Discard Rate (avg)

Graph 4:

- Throughput In (avg)
- Throughput Out (avg)
- Throughput (avg)

Graph 5:

This graph is shown only if the node is capable of exporting Traffic data (netflowv5, Netflowv9, SFlowv5, IPFIX).

- Volume - In Bytes (sum)
- Volume - Out Bytes (sum)

How to Find Data for an Interface in the NNMi Analysis Panel

You can find data for NNMi interfaces through the performance analysis panel.

To select an interface, start in a view in the NNMi console. The performance panel opens once you select an interface.

Graphs show data captured over the past day.

You can adjust the time period shown by clicking the arrow on the top right-hand side. This opens the time navigation panel. Any change you make is reflected in all of the graphs.

The following graphs are provided:

Graph 1:

- Availability (avg)

Graph 2:

- Utilization In (avg)
- Utilization Out (avg)
- Utilization (avg)

Graph 3:

- Discard Rate In (avg)
- Discard Rate Out (avg)
- Discard Rate (avg)

Graph 4:

- Throughput In (avg)
- Throughput Out (avg)
- Throughput (avg)

Graph 5:

This graph is shown only if the node is capable of exporting Traffic data (netflowv5, Netflowv9, SFlowv5, IPFIX).

- Volume - In Bytes (sum)
- Volume - Out Bytes (sum)

How to Find Data for a Node in the NNMi Analysis Panel

You can find data for NNMi nodes through the performance analysis panel.

To select a node, start from the Flow Enabled Nodes view in the NNMi console. The performance panel opens once you select a node.

Graphs show data captured over the past day.

You can adjust the time period shown by clicking the arrow on the top right-hand side. This opens the time navigation panel. Any change you make is reflected in all of the graphs.

If you select a node for which no polling is being done, the performance panel will be blank.

The following graphs are provided:

Graph 1:

- Memory Utilization (avg)
- Memory Utilization - Threshold Exception Rate

Graph 2:

- CPU Utilization (avg)
- CPU Utilization - Threshold Exception Rate

Graph 3:

- Node Backplane Utilization (avg)
- Node Backplane Utilization - Threshold Exception Rate

Graph 4:

This graph is shown only if the node is capable of exporting Traffic data (netflowv5, Netflowv9, SFlowv5, IPFIX).

- Volume - In Bytes (sum)
- Volume - Out Bytes (sum)

How to Find Data for a Node Fault in the NNMi Analysis Panel

You can find data for NNMi nodes through the performance analysis panel.

When NNMi detects that a node is down (not responding), a NodeDown event is generated.

To select a NodeDown incident, start from the Incident view in the NNMi console. The performance panel opens and displays several graphs.

The graphs report data for the following time period:

- Start Time: Time period of incident minus 1 hour
- End Time: Time period of incident plus 1 hour

If the plus 1 hour time period is not possible, data for the past 1 hour is shown.

To navigate forward in the graph, click >. To navigate backward, click <.

You can adjust the time period shown by clicking the arrow on the top right-hand side. This opens the time navigation panel. Any change you make is reflected in all of the graphs.

The following graphs are provided:

Graph 1:

- Memory Utilization (avg)
- CPU Utilization (avg)

Graph 2:

- CPU Utilization - Threshold Except Rate
- Memory Utilization - Threshold Exception Rate

How to Find Data for a Node Performance Event in the NNMi Analysis Panel

You can find data for NNMi nodes through the performance analysis panel.

To select a performance incident for a performance-polled node, start from the NNMi Incident view in the NNMi console. If NNMi detects that a node is violating a configured performance metric threshold—for example, CPU utilization—a CPUOutofRangeOrMalfunctioning event is generated and made visible in the Incident view. When you click this incident, a performance tab appears in the analysis pane. When you click the tab, the graphs described below appear.

Supported events are:

- CPUOutofRangeOrMalfunctioning
- BufferOutOfRangeOrMalfunctioning
- MemoryOutOfRangeOrMalfunctioning

The graphs report data for the following time period:

- Start Time: Time period of incident minus 1 hour
- End Time: Time period of incident plus 1 hour

If the plus 1 hour time period is not possible, data for the past 1 hour is shown.

You can adjust the time period shown by clicking the arrow on the top right-hand side. This opens the time navigation panel. Any change you make is reflected in all of the graphs.

If you select a node for which no polling is being done, the performance panel will be blank.

The following graphs are provided:

Graph 1:

- Memory Utilization (avg)
- CPU Utilization (avg)

Graph 2:

- CPU Utilization - Threshold Exception Rate
- Memory Utilization - Threshold Exception Rate

Graph 3:

This graph is shown only if there is a Buffer incident.

- Buffer Utilization
- Lower and Upper Thresholds for Buffer Utilization

Graph 4:

This graph is shown only if there is a Buffer incident.

- Buffer Hits and Misses

How to Find Data for an SNMP Agent in the NNMi Analysis Panel

You can find data for NNMi nodes that host an IP address through the performance analysis panel.

To select an SNMP agent, start from the SNMP Agent Inventory view in the NNMi console. The performance panel opens.

Graphs show data captured over the past day.

You can adjust the time period shown by clicking the arrow on the top right-hand side. This opens the time navigation panel. Any change you make is reflected in all of the graphs.

You can refresh the graphs with the Refresh button.

The following graphs are provided:

Graph 1:

- ICMP response time
- SNMP response time

Graph 2:

- CPU Utilization (avg)
- Memory Utilization (avg)

Graph 3:

- CPU Utilization - Threshold Exception Rate
- Memory Utilization - Threshold Exception Rate

How to Find Connection Data for a Node in the NNMi Analysis Panel

You can find connection data for NNMi nodes through the performance analysis panel.

To select a node, start from the Flow Enabled Nodes view in the NNMi console. The performance panel opens once you select a node.

Graphs show data captured over the past day.

To navigate forward in the graph, click >. To navigate backward, click <.

You can adjust the time period shown by clicking the arrow on the top right-hand side. This opens the time navigation panel. Any change you make is reflected in all of the graphs.

If you select a node for which no polling is being done, the performance panel will be blank.

The following graphs are provided:

Graph 1:

- Memory Utilization (avg)
- Memory Utilization - Threshold Exception Rate

Graph 2:

- CPU Utilization (avg)
- CPU Utilization - Threshold Exception Rate

Graph 3:

- Node Backplane Utilization (avg)
- Node Backplane Utilization - Threshold Exception Rate

Graph 4:

This graph is shown only if the node is capable of exporting Traffic data (netflowv5, Netflowv9, SFlowv5, IPFIX).

- Volume - In Bytes (sum)
- Volume - Out Bytes (sum)

How to Find Interface Data for NNMi Ports in the NNMi Analysis Panel

You can find data for NNMi ports through the performance analysis panel.

To select an interface, start in a view in the NNMi console. The performance panel opens once you select an interface.

Graphs show data captured over the past day.

You can adjust the time period shown by clicking the arrow on the top right-hand side. This opens the time navigation panel. Any change you make is reflected in all of the graphs.

The following graphs are provided:

Graph 1:

- Availability (avg)

Graph 2:

- Utilization In (avg)
- Utilization Out (avg)
- Utilization (avg)

Graph 3:

- Discard Rate In (avg)
- Discard Rate Out (avg)
- Discard Rate (avg)

Graph 4:

- Throughput In (avg)
- Throughput Out (avg)
- Throughput (avg)

Graph 5:

This graph is shown only if the node is capable of exporting Traffic data (netflowv5, Netflowv9, SFlowv5, IPFIX).

- Volume - In Bytes (sum)
- Volume - Out Bytes (sum)

How to Find Data for an Interface Performance Event in the NNMi Analysis Panel

You can find data for interfaces through the performance analysis panel.

When NNMi detects that an interface is violating a configured performance metric threshold (for example, utilization), an InterfaceUtilization event is generated and shown in the Incident view. When you click this incident, the performance analysis panel opens.

The graphs report data for the following time period:

- Start Time: Time period of incident minus 1 hour
- End Time: Time period of incident plus 1 hour

If the plus 1 hour time period is not possible, data for the past 1 hour is shown.

The following types of incidents are reported:

- InterfaceFCSWLANErrorRateHigh
- InterfaceFCSLANErrorRateHigh
- InterfaceInputDiscardRateHigh
- InterfaceOutputDiscardRateHigh
- InterfaceInputUtilizationHigh
- InterfaceOutputUtilizationHigh
- InterfaceOutputErrorRateHigh
- InterfaceInputErrorRateHigh

The following graphs are provided for each incident:

- Interface Utilization
- Interface Availability

- Interface Throughput
- Interface Discard and Error Rate

Baseline Metrics

NPS provides baseline metrics that define the normal (expected) range of values for any given metric. Baseline metrics enable you to forecast the future value for a given metric on the basis of historical data. They are the following:

- **Seasonality** – Represents a periodic and repetitive pattern in the metrics utilization levels. The repetitive (cyclic) nature of this pattern enables NPS to predict the future utilization values for the metric. The default period for seasonality is one week with five minutes granularity.
- **Initialization period** – Represents the period during which NPS collects data required for calculating the baseline metrics. NPS does not generate any exceptions for this period, considering the data range to be insufficient to calculate a reasonable normal range.

  For example, if the initialization period is set as four weeks,NPS does not calculate any baseline exception for these four weeks. After four weeks, NPS calculates the normal ranges of metric values based on the data collected during these four weeks. The default initialization period for NPS is three weeks or three seasons. The default time range for each season is one week.
- **Adaptation Parameters** – Represents the technique used to smooth the historical data for a given time range and forecast the metrics value. NPS uses intercept, trend, and seasonal adaptation formulas to smooth the historical data and calculate the forecast value.

Metric Aggregations

Various metrics provided in standard reports are available as aggregations. The following are available:

Term	Description
avg	average of all samples
max	maximum of all samples
min	minimum of all samples
pctile05	5 percent of samples fall below, and 95 percent fall above
pctile90	90 percent of samples fall below, and 10 percent fall above
pctile95	95 percent of samples fall below, and 5 percent fall above
pctile99	99 percent of samples fall below, and 1 percent fall above
sum	sum of all samples
countDistinct	

Reports that are run with any of the percentile aggregations will run more slowly and use more memory. This is because data must be retrieved from the raw data table. The retention period for

raw data determines whether you can retrieve percentile data. To retrieve percentile data over a long time range, you must set the retention period for the raw data so that it matches the timeframes over which you want to retrieve the data.

Percentiles can be used in custom reports you create using "Create Custom Reports with Query Studio" (on page 75).

Baseline Exceptions Generated by the iSPI Performance for Metrics

NPS stores the records that are marked with baseline exceptions. These records reflect only the most recent fact record for any affected component, interface, node, or node group. These records reflect the average baseline exceptions for each of the metrics used by an Extension Pack.

For individual samples, the baseline exception is either represented as 0% or as 100%. The iSPI Performance uses this table to perform the following tasks:

- Provide an interface to HP Network Node Manager i Software (NNMi). NNMi in turn creates incidents for each interface marked with a baseline exception.
- Generate ad hoc reports for the interfaces that are currently having baseline exceptions, thus having any network health or performance problems.

See also "Baseline Exceptions Used by the iSPI Performance for Metrics" (on page 88).

Baseline Exceptions Used by the iSPI Performance for Metrics

Component Health

Baseline exceptions are enabled for the following metrics in the Component Health Extension Pack:

- Memory Utilization
- Buffer Utilization
- Buffer Miss Rate
- Buffer Failure Rate
- Buffer No Memory Rate
- CPU 1min Utilization
- CPU 5sec Utilization
- CPU 5min Utilization

Interface Health

Baseline exceptions are enabled for the following metrics in the Interface Health Extension Pack:

- Utilization In
- Utilization Out
- Error Rate In
- Error Rate Out

- Discard Rate In
- Discard Rate Out

Baseline Metrics Glossary

Baseline metrics compute the trends, seasonal patterns, and time range deviations for the iSPI Performance products. Baseline metrics are the following.

Metric	Description
Baseline Average	Average value presenting the normal (expected) range of utilization for the selected topology filter based on the historical data Can analyze the following using this metric: • The actual utilization of the topology filter as compared to the normal utilization ranges • Forecast the topology filter utilization for a selected time range. • Identify the over-utilized and under-utilized topology filters before they violate the thresholds.
Baseline Deviation	Deviation of the samples spread over a specific time range. Represents the extent of the range of values normally seen for the selected time range in the seasonal cycle, based on historical data. Can analyze the following using this metric: • Analyze the utilization pattern for the selected topology filters over a selected time range. • Identify the utilization values that are lower or higher than the mean utilization. This in turn enables you to identify the over-utilized and under-utilized topology filters.
Baseline Slope	Increase or decrease in the average utilization in one day. Negative slope indicates a declining trend. Can analyze the following using this metric: • Identify any unexpected change in the topology filter utilization. • Avoid resource bottlenecks by identifying gradual increase in resource utilization. • Identify the point in a selected time range when the resource utilization was the highest or lowest. This enables you to derive a pattern in the topology filter utilization.
Upper Normal	Upper limit of the normal range for the sample. The normal range for the sample may vary for every iSPI Performance product. NNMi supplies the upper normal value based on values that you enter in the Threshold Configuration form. You can disable the upper normal value if you do not require to set the upper threshold for the metric.

Metric	Description
	See the *HP Network Node Manager i Software Online Help for Administrators* for information about the Threshold Configuration form. The value is calculated using the following formula: Upper Normal = Baseline Average + (N1 * Baseline Deviation) where N1 is the upper sleeve width
Lower Normal	Lower limit of the normal range for the sample. The normal range for the sample can vary for every iSPI Performance product. NNMi supplies the lower normal value based on values you enter in the Threshold Configuration form. You can disable the lower normal value if you do not set the lower threshold for the metric. See the *HP Network Node Manager i Software Online Help for Administrators* for information about the Threshold Configuration form. The value is calculated using the following formula: Lower Normal = Baseline Average - (N2 * Baseline Deviation) where N2 is the lower sleeve width
Days to Threshold	Forecast for the topology filter utilization to reach the upper or lower threshold limit. Represents the number of days left for the utilization to reach the threshold value. NPS calculates this metric based on the following: • Baseline Slope • The static upper and lower thresholds defined in NNMi Threshold Configuration form
Exception Count	Total number of sample counts marked for an exception. NPS raises an exception for the metric if the a certain number of samples within a sample window are out of normal range. For example, NPS raises a baseline exception if 7 samples out of a sample window of 10 samples are beyond the upper normal range. You must configure NNMi for the upper and lower normal ranges to enable NPS to raise the exceptions. If the topology filter utilization is between Upper Normal and Lower Normal, the exception count is set to 0 (Zero) for the selected sample. If you disable the upper or lower normal thresholds in NNMi, NPS does not raise exceptions for the upper and lower normal ranges. The iSPI Performance products can analyze the following using this metric:

Metric	Description
	• Analyze the performance of the selected topology filter for a specific time range. • Identify network performance problem if the exception count is persistently high for the selected time range.
Baseline Exception Rate	Percentage of samples that has the exception flag set.
Forecast Baseline (avg) • 4 week • 8 week • 12 week	Average value presenting the normal (expected) range of utilization for the selected topology filter based on the forecast data. Can analyze the following using this metric: • The forecast utilization of the topology filter as compared to the normal utilization ranges. • Forecast the topology filter utilization for a selected time range. • Identify the over-utilized and under-utilized topology filters before they violate the thresholds.
Forecast Upper Normal (max) • 4 week • 8 week • 12 week	Upper limit of the normal range for the forecast data. The normal range for the data may vary for every iSPI Performance product.
Forecast Lower Normal (min) • 4 week • 8 week • 12 week	Lower limit of the normal range for the forecast data. The normal range for the data may vary for every iSPI Performance product.

Custom Dashboards

You can create dashboards based on multiple reportlets from the same or different Extension Packs.

Say that you needed to monitor the following:

- Hourly utilization of Interface A on Component X
- Average normal CPU utilization for Component X
- Number of days left for memory utilization to reach threshold

You could create a custom dashboard that combines the following reportlets:

- Interface Health Heat Chart Report for the metric Utilization (avg)
- Component Health Simple Chart Report for the following metrics:
  - Primary metric: Memory Utilization - Baseline Average (avg)
  - Secondary metric:CPU 5min Utilization - Days to Threshold (min)

Create a Custom Dashboard with the iSPI Performance BI Server Portal

To create a custom dashboard:

Task 1: Log in to NPS

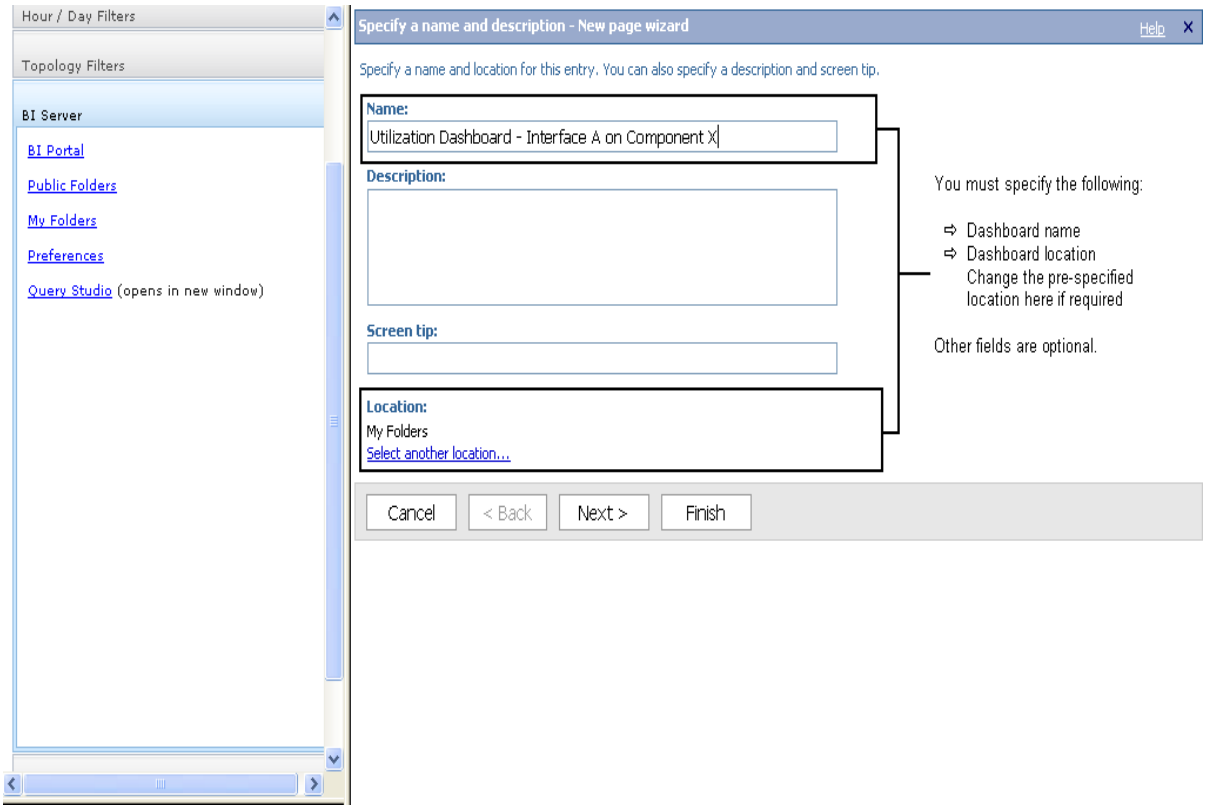
Task 2: Copy bookmarks for the reportlets to include in the dashboard

1. On the NPS home page, click the **Dashboard Reportlets** tab.
2. Select an Extension Pack; for example, **iSPI Metrics** > **Interface Health** > **InterfaceMetrics**.
3. Select a reportlet; for example, Heat Chart reportlet.
4. Click **Show Bookmark**.
5. Copy the bookmark and paste it in a text editor.

Repeat these steps for all the reportlets you want included in the dashboard.

Task 3: Create the dashboard using the BI Portal

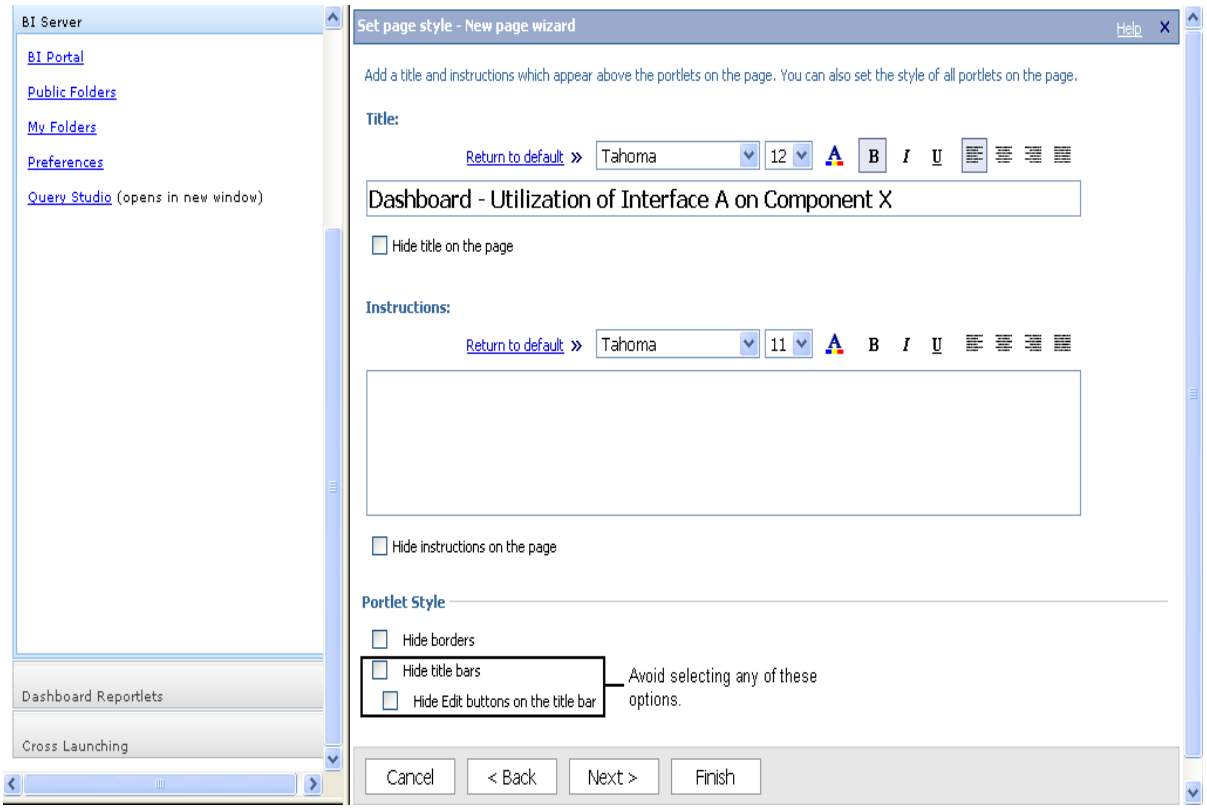
1. On the NPS home page, click the **BI Server** tab.
2. Select **BI Portal**.
3. Select a location for your dashboard; for example, My Folders.
4. Click  **New Page**.
5. In the Specify a name and description-New page wizard form, specify the required information about the dashboard.



6. In the Set columns and layout-New page wizard form, specify:
   - Number of columns you require in the dashboard
   - Width of the columns. For a multi-column dashboard, the columns must be the same width.
7. In the Set columns and layout-New page wizard form, click **Add**.
8. Select **Cognos Utility**.
9. In the Available entries column, select a utility; for example, to display multiple reportlets in the dashboard, select **HTML Viewer**.
10. Click  **Add** to move the selected utilities in the Selected entries column.
11. Click **OK**.
12. Click **Next**.
13. In the Set page style-New page wizard, specify the title, style, and any instructions you want the dashboard to display.

    Do not select the following:
    - Hide title bars
    - Hide Edit buttons on the title bar

    The Edit button must be on the title bar.



14. Click **Next**.
15. In the Select an action-New page wizard form, select the required options and click **Finish**.

The new dashboard opens in Edit mode.

Task 4: Edit the dashboard to display the selected reportlets

1. Select any of the following tools:
   - **Edit** in the title bar
   - **Edit** in the Actions column
2. Specify the content for the dashboard using the reportlet bookmark. For example, if you selected HTML Viewer to view the dashboard reportlets, copy the bookmark you saved in the text editor and paste it in the HTML content field.
3. Specify the height for the panel where Cognos displays the reportlet.
4. Click **OK**.

Troubleshooting

See the following topics for specific information:

- "Problem: Reports take too long to display" (on page 101)
- "Problem: You must log in again when navigating from NNMi to an iSPI Performance product report" (on page 102)
- "Problem: NNMi Console Action menu has no link to the Reporting–Report menu" (on page 103)

Errors and Warnings Glossary

You can open a reference list of commands by going to the command index.

A	B	C	D	E	F	General

Message	Type	Cause/Suggested Actions
A		
Attempting to extend allocated space for DBSPACE {DB_SPACE} using dbsize.ovpl	WARN	The database requires additional disk space. The ETL process will allocate more.
Attempting to restart HP BI Server processes	WARN	The BI server process stopped while ETL was running. ETL will attempt to restart the process.
Attempting to restart HP DB Server	WARN	The database server process stopped while ETL was running. ETL will attempt to restart the process.
Automatic NNM HA add-on configuration failed: Exit Code {EXIT_CODE}	ERROR	High availability configuration failed.
B		
BI Processes not running	WARN	The BI server process stopped while ETL was running.
BI Processes still not running...restart attempt failed.	ERROR	The BI server process stopped while ETL was running. ETL has attempted to restart the process but failed to do so, and ETL cannot continue. Try starting the BI server process manually using startBI.ovpl.

Message C	Type	Cause/Suggested Actions
Cannot extract remote nnm hostname from value of PRSPI_NNMDIR ({PRSPI_NNMDIR})	ERROR	On a dedicated server installation, the configuration entry for the NNMi shared directory should contain the name of the NNMi server. Failure to determine this hostname affects application failover configurations.
Cannot find the OV Install Dir <{DIR}>.	ERROR	*%nnminstalldir%* does not exist. Check the NNMi installation.
Cannot find the nnm.ports.properties file to establish port for jboss http server.	ERROR	If the jobs port cannot be determined, the iSPI cannot be enabled. Check NNMi installation.
Check NNM HA environment, and then run nnmenableperfspi.ovpl.	ERROR	Enabling the iSPI in an HA environment must be done in a specific order. See the HA-specific topic in the *NNMi Deployment Guide* for more information.
Check your environment for NNM environment variables and run nnmenableperfspi.ovpl.	ERROR	Some or all required NNMi variables cannot be determined. Check NNMi installation.
Command Failed: {PERL} getNNMActiveScript: {CHILD_ERROR}	ERROR	An application failover specific script failed. Check your application failover environment.
Command Failed: {UNZIP} {ZIPFILE}: {CHILD_ ERROR}	ERROR	An error occurred unzipping the identified file. The CHILD_ ERROR might give more information (corrupt zip file, permissions issue, etc.).
Command: {OVDIR}/misc/nnm/ha/nnmhaclusterinfo.ovpl -config NNM -get HA_PERFSPI_ADAPTER_DIR	ERROR	A high availability specific script failed. Check your high availability environment.
Command: {OVDIR}/misc/nnm/ha/nnmhaclusterinfo.ovpl -config NNM -get NNM_INTERFACE	ERROR	A high availability specific script failed. Check your high availability environment.

Message	Type	Cause/Suggested Actions
Command: {OVDIR}/misc/nnm/ha/nnmhaconfigure.ovpl NNM -addon PerfSPIHA	ERROR	A high availability specific script failed. Check your high availability environment.
Configuration file contains errors.	ERROR	The iSPI configuration file contains errors. Check the associated error messages for specifics.
Configuration: Unable to access directory {PRSPI_METRICS}	ERROR	The shared directory for metrics is inaccessible. Check that NFS or Samba is operating properly.
Configuration: Unable to access directory {PRSPI_NNMDIR}	ERROR	The main shared directory is inaccessible. Check that NFS or Samba is operating properly.
Configuration: Unable to access directory {PRSPI_TOPODUMP}	ERROR	The shared directory for topology information is inaccessible. Check that NFS or Samba is operating properly.
Configuration: Directory {PRSPI_METRICS} must have write access	ERROR	The shared directory for metrics is not writeable. Check your NFS or Samba configuration and file permissions.
Configuration: Directory {PRSPI_TOPODUMP} must have write access.	ERROR	The shared directory for topology information is not writeable. Check your NFS or Samba configuration and file permissions.
Configuration: java not found in 'java_dir' ({java_ dir})	ERROR	The HP Java installation appears to be corrupted.
Configuration: perl not found in 'perl_dir' ({perl_dir})	ERROR	The HP Perl installation appears to be corrupted.
Configuration: {NAME} not defined.	ERROR	A required configuration parameter is not defined.
Configuration: {NAME} value must be a valid path. Invalid value: {VALUE}	ERROR	A required configuration parameter must be a valid path and it is not.
Configuration: {NAME} value must be numeric. Invalid value: {VALUE}	ERROR	A required configuration parameter must be numeric and it is not.

Message	Type	Cause/Suggested Actions
D		
DB Processes still not running...restart attempt failed.	ERROR	The database server process stopped while ETL was running. ETL attempted to restart the process but failed to do so. ETL cannot continue. Try starting the database server process manually using startDB.ovpl
DBSPACE {DBSPACE}, FILE {FILE}: Cannot extend because there is no reserve space left.	WARN	The database needs to be extended but cannot because there is no disk space available. You should free existing disk space or add new disks before your database runs out of space.
DBSPACE {DBSPACE}, FILE {FILE}: Cannot extend {PATH} because there is insufficient disk space left on the file system.	WARN	The database needs to be extended but cannot because there is no disk space available. You should free existing disk space or add new disks before your database runs out of space.
Database Processes not running!	WARN	The database server stopped while ETL was running.
Dropping connection_id {CONNECTION_ID}	WARN	The specified connection is being dropped. This is normally a transparent operation for report users.
E		
Error - Unable to remove the nnm actions for iSPI for Performance	WARN	Check that NNM is running. You can also remove actions from the NNMi console.
Error running dbisql: {DB_ERROR} ({SQL})	WARN	The described SQL error occurred. Check for other messages associated with this one.
Expected PRSPI_NNMDIR of form /net/hostname/var... or //hostname/PerfSpi	WARN	On a dedicated server install, the NNM directory path should be one of the forms shown.
Extension Pack {EXTENSION_PACK}: process not running. Restarting	WARN	An ETL process had to be restarted.

Message F	Type	Cause/Suggested Actions
Failed archiving logfile PerfSPI_Diagnostic_ Metrics.log	WARN	The log archive process failed.
Failed archiving logfile prspi.log	WARN	The log archive process failed.
Failed building Extension Pack for new or updated NNM metadata: {METADATA}	ERROR	This should not be encountered by customers.
Failed chdir to {DIR}: {OS_ERROR}	ERROR	Failed changing directory to the specified directory. The OS error might give more information (directory does not exist, permissions, etc.).
Failed command:copy({FILE_LIST}):{OS_ ERROR}	WARN	Failed copying the specified files. The OS error might give more information (directory does not exist, permissions, etc.).
Failed command:copy({FILE_LIST}):{OS_ ERROR}	ERROR	Failed copying the specified files. The OS error might give more information (directory does not exist, permissions, etc.). The program immediately exits.
Failed command:fork():{OS_ERROR}	ERROR	Failed forking (creating a new process). The OS error might give more information (lack of system resource, etc.). The program immediately exits.
Failed command:mkpath({PATH_LIST}):{OS_ ERROR}	ERROR	Failed creating the specified directories. The OS error might give more information (directory does not exist, permissions, etc.). The program immediately exits.
Failed command:mkpath({PATH_LIST}):{OS_ ERROR}	WARN	Failed creating the specified directories. The OS error might give more information (directory does not exist, permissions, etc.).

Message	Type	Cause/Suggested Actions
Failed command:move({FILE_LIST}):{OS_ ERROR}	ERROR	Failed moving the specified files. The OS error might give more information (directory does not exist, permissions, etc.). The program immediately exits.
Failed command:move({FILE_LIST}):{OS_ ERROR}	WARN	Failed moving the specified files. The OS error might give more information (directory does not exist, permissions, etc.).
Failed command:open({HANDLE},{ARGS}):{OS_ ERROR}	ERROR	Failed opening the specified file. The arguments and OS error might give more information (directory does not exist, permissions, etc.). The program immediately exits.
Failed command:open({HANDLE},{FLAG},{ARGS}):{OS_ ERROR}	ERROR	Failed opening the specified file. The arguments and OS error might give more information (directory does not exist, permissions, etc.). The program immediately exits.
Failed command:opendir(DIR,{DIR Configuration: {NAME} not defined.NAME}):{OS_ERROR}	WARN	Failed opening the specified directory. The OS error might give more information (directory does not exist, permissions, etc.).
Failed command:system({COMMAND}:{CHILD_ ERROR})	WARN	Failed running the specified system command. The OS error might give more information (lack of system resources etc.).
Failed command:system({COMMAND}):{CHILD_ ERROR}	ERROR	Failed running the specified system command. The OS error might give more information (lack of system resources etc.). The program immediately exits.
Failed command:unlink({FILE_LIST}):{OS_ ERROR}	ERROR	Failed removing the specified files. The OS error might give more information (directory does not exist, permissions, etc.). The program immediately exits.
Failed command:unlink({FILE_LIST}):{OS_ ERROR}	WARN	Failed removing the specified files. The OS error might give more information (directory does

Message	Type	Cause/Suggested Actions
		not exist, permissions, etc.).
Failed copying {SRC} to {DEST}: {OS_ERROR}	ERROR	Failed copying file from specified source to destination. The OS error might give more information (directory does not exist, permissions, etc.).
Failed creating {FILE}: {OS_ERROR}	ERROR	Failed creating the specified file. The OS error might give more information (directory does not exist, permissions, etc.).
General Warnings		
⚠ <Package name>	WARN	This warning can appear for any one of the following reasons: • There is no data in the topology tables for the displayed package. • The topology filters chosen will result in empty reports. • The topology filters chosen are not appropriate for the selected package and will be dropped.
⚠ The system is currently running with demonstration data!	WARN	The system is currently running with demonstration data.

Problem: Reports take too long to display

The problem could be due to one of the following.

- Did NNMi experience a recent topology reset?

  Check the current NNMi topology:

  a. Log in to NNMi console using your username and password.

  b. Click **Topology Map**.

  c. Click **Network Overview**. This view is updated frequently when the topology goes through a change.

- Were one or more interface groups recently added to performance monitoring?

  Check the interface groups:

  a. Log in to the NNMi console using your username and password.

  b. Click **Inventory**.

c. Click **Interface Groups**.

The Interface Group-Interface Groups form displays the interface groups available in the network.

- Are large numbers of users logged in to the system?

  Enable more parallel BI Server processes. Follow the recommendations in the BI Server tuning guides.

- Are the hardware resources over-utilized?

  Check if NNMi generated any resource-related incidents:

  a. Log in to the NNMi console using your username and password.

  b. Click **Incident Management**.

  c. Click **Open Key Incidents** to check for any resource-related incidents.

  Check hardware statistics, especially aggregate CPU usage.

  Verify that disk speed is adequate. For large networks, a RAID5 8-spindle is recommended.

General Resolution Tips

- Create a report view with the required prompts and schedule this report view to run on a regular basis. View the scheduled output, or bookmark a URL to view the scheduled output. For more information on scheduling reports, see Schedule Delivery of Reports.
- Filters can improve report performance. A report on a specific node group is generally faster than a report on All Nodes/Interfaces. The same logic applies to the time dimension. For more information on report filters, see the following topics:
  - Set Topology Filters
  - Change Time Controls
- Run the same report again. Data caching, which took place the first time you ran the report, will decrease the run time the next time you run the same report.

Problem: You must log in again when navigating from NNMi to an iSPI Performance product report

This can occur if you launch the NNM console using the IP address of the NNMi system and not NNM's fully-qualified domain name (FQDN). Always use the FQDN of the NNMi system to log in to the NNMi console.

Whenever you navigate from NNMi to a report, account information is passed between your NNM login session and NPS using cookies in your browser. A function known as Single Sign-On (SSO) makes it possible for you to move from NNM to a report without having to log in a second time.

For SSO to operate, the following conditions must be met:

- The NNMi system and the NPS system must each be configured with an FQDN.
- You must use the FQDN in your browser (not "localhost" or the machine name minus the domain) when you launch the NNMi console.

An FQDN has the following format:

http://fully_qualified_domain_name:port/nnm

If NNMi and NPS are installed on the same machine, the SSO function will operate if you use either of the following:

- NNM's FQDN
- NNM's IP address

NPS is responsible for configuring the use of NNMi's IP address. This takes place automatically when NPS is installed.

Problem: NNMi Console Action menu has no link to the Reporting–Report menu

If you do not completely (and successfully) run the enablement script, the NNMi console does not display the **Reporting-Report menu** item in the **Action** menu.

See the instructions in the *Installation Guide* for running the enablement script (`nnmenableperfspi.ovpl`) on the NNMi management server.

Error: NNMi is not polling one or more objects for performance data

The problem could be due to either of the following.

- Is NNMi polling the specified devices for performance data?
  a. Navigate to the Monitoring Configuration form in NNMi and check the polling attributes.
  b. Examine the polling attributes for the device and any group the device belongs to.
- Can NNMi synchronize topology information with NPS?

  NNMi and NPS share topology information. Most of the time, this information is fully synchronized. However, certain conditions will cause the iSPI Performance's view of the network topology to vary slightly from NNMi's view. A lack of topology synchronization can occur under the following conditions:

  - NNMi is running discovery.
  - NNMi rediscovers an existing network.
  - NNMi is adding or removing nodes, interfaces, or groups from polling policies.

  Should any of these occur, you will see:

  - An error indicating that NNMi is not polling targeted objects for performance data
  - "Unmanaged" next to nodes and interfaces in the Path Health report

Problem: Leaving a report open requires re-login

NPS requires you to re-login to view a report under the following conditions:

- You are trying to access NPS without being authenticated by NNMi.
- You pointed your browser at NPS without first logging in to NNMi.
- Your browser session has expired.

You can resolve this by loggin in again to return to NPS.

Problem: Leaving the browser open for a while prevents re-login

The inactivity timeout setting for NPS is 1 hour. If your browser is inactive for 1 hour, your session expires. You must log in again. The login window requires the administrator username and password.

1. Close the timeout login window.
2. Log in to the NNMi console using the standard URL:

   http://fully-qualified-hostname:port;/nnm
3. Navigate to the iSPI Performance report you were using.

Problem: Exception counts are missing from reports

Did you define thresholds in NNMi?

Reports will not track exception counts unless high and low thresholds are set in NNMi.

If reports are not showing exception counts, the NNMi administrator did not set thresholds.

Setting up thresholds in NNMi requires administrator privileges. To locate applicable help topics:

1. Launch the NNMi console.
2. Click **Help** > **Help for Administrators**.
3. Select **Configure Threshold Monitoring for Nodes**

Immediately after thresholds are set, exceptions will begin registering in reports.

Problem: NPS stops functioning and does not show any reports

Did you change the address or hostname of NPS?

If, after installing NPS, you modify the IP address, hostname, or MAC address, you cannot restart NPS. As a result, you cannot view any reports.

To change the IP address, hostname, or MAC address of the NPS server:

1. On the NPS server, run the following command:

   Windows:

   `%NPSInstallDir%\NNMPerformanceSPI\bin\stopAll.ovpl`

   Linux:

   `/opt/OV/NNMPerformanceSPI/bin/stopALL.ovpl`
2. Open the BI Server configuration GUI with the following command:

   Windows:

   `%NPSInstallDir%\NNMPerformanceSPI\bin\runBIConfigGUI.ovpl`

   Linux:

   `/opt/OV/NNMPerformanceSPI/bin/runBIConfigGUI.ovpl`
3. Click **File** > **Export As**.

4. Specify a location and file name in the dialog box and click **Save**.

   The configuration data is saved in XML format.

5. Manually delete the following directories:

   Windows:

   `%NPSInstallDir%\nonOV\cognos\c8\configuration\signkeypair`

   `%NPSInstallDir%\nonOV\cognos\c8\configuration\encryptkeypair`

   Linux:

   `/opt/OV/nonOV/cognos/c8/configuration/signkeypair`

   `/opt/OV/nonOV/cognos/c8/configuration/encryptkeypair`

6. Copy the XML file saved in step 4 to the following directory:

   Windows:

   `%NPSInstallDir%\nonOV\cognos\c8\configuration`

   Linux:

   `/opt/OV/nonOV/cognos/c8/configuration`

You can find detailed information about the commands by going to the command index.

Problem: Report shows gaps in displayed data

This can happen when there is a conflict between the polling interval and the display grain selected for the report.

When you select a finer grain for your report than the polling interval selected in NNMi, the iSPI Performance displays all the intermediate time entries and the data available for them. If these intermediate time entries do not contain any data sample, the reports might display missing entries in tables or gaps in the graphs and charts.

Resolution

Set a greater display grain for the report than the polling interval defined for the device in NNMi. For example, if the polling interval for the interface is configured as 1 minute, make sure that the display grain for the reports related to the interface is at least 1 minute.

Problem: Need more information about polling

Performance polling impacts NNMi and your network. If you enable additional performance polling, NNMi must allocate a portion of its resources to handling the additional polling, and your network will have to accommodate an increase in SNMP traffic. To ensure that the performance polling does not cause wasted resources, it is important to limit performance polling to important devices.

You must have NNMi administrator privileges to enable performance polling.

To find additonal information about polling:

1. Launch the NNM console.
2. Click **Help** > **Help for Administrators**.
3. Select **Monitoring Configuration**.

Problem: Need more information about creating new node groups

Creating a new node group requires setting device-level filters. After you create the new node group, you could use the group to filter NNMi views. You could also add the node group as a filter to the iSPI element selection tree.

Creating node groups and using the filter options are NNMi administrator tasks.

To find more information:

1. Launch the NNMi console.
2. Click **Help** > **Help for Administrators**.
3. Select **Monitoring**.

Problem: Content store can hang during upgrade when the database is in use for scheduled jobs or reports

If the content store database is in use for writing by schedules or jobs, the export can fail.

The solution is to go to the BI Server portal prior to upgrade and disable the schedules and stop some of the services the dispatcher runs.

Follow these steps:

1. Log in to the BI Portal and launch BI Administration.
2. Open the **Status** tab.
3. Click **Schedules** in the list on the left.
4. Click the check box at the top of the list.
5. Click the **Disable** icon in the top right.
6. Select the **Configuration** tab.
7. Select **Dispatchers and Services** from the list on the left.
8. Click the dispatcher in the displayed list. You will see a list of services. Be aware that, by default, there is more than one page to this list.
9. Click **More** for each of the following services, and then immediately click **Stop**.
   - BatchReportService
   - JobService
   - ReportService

About ATM Reports

ATM reports show performance data for the ATM PVC Health data collected by NNMi. Graphs and charts on these reports help you identify the following:

- Volume of data passed through the selected ATM virtual circuits
- Average, minimum, and maximum utilization of the selected ATM virtual circuits

- Number of discarded AAL5 CPCS PDUs in the selected ATM virtual circuits
- Number of AAL5 CPCS PDUs marked for discard for the selected ATM virtual circuits

Use these reports to determine the status of the ATM PVC Health virtual circuits on your network.

Opening Reports from NNMi

From the NNMi Console, you have the following options:

- Move from NNMi to the iSPI and launch reports from the Report tab in the navigation panel.
- Launch a pre-filtered report directly from NNMi if you are interested in a particular node group, node, interface, or virtual circuit. Otherwise, open a workspace view from NNM, move to the iSPI, and begin your investigation from the NPS home page.

  To move from NNM to the iSPI:

  a. Log in to the NNMi console.

  b. Select a workspace.

  c. Open a view of nodes, interfaces, or incidents.

  d. Select **Actions** > **HP NNM iSPI Performance** > **Reporting - Report Menu**

ATM Calendar Report

The Calendar report uses a traditional, calendar-style layout to show hourly statistics for two metrics in a single, extended graph spanning over multiple days.

Features and Defaults

The report defaults to:

- ATM PVC Name = All
- Dates/Times = Last 31 days
- Metric(s) Shown on Y1 Axis (Primary Metric) = Volume Bytes (sum)
- Metric(s) Shown on Y2 Axis (Secondary Metric) = CIR Utilization (avg)

The default view shows data for the current month. Depending on how long the iSPI has been collecting data from NNMi, you may have the option of looking at data for the previous 70 days if you use the option Until Now.

If you set the Time Range to less than 24 hours, the following message appears:

```
This report is not designed to operate with a time range of less than
24 hours. Please modify your time selections.
```

How to Use this Report

Use this report to:

- Observe gradual trends over time
- Observe isolated spikes
- Verify that an abnormal condition has returned to normal
- Make comparisons

This report reveals:

- Day of week patterns
- Hour of day patterns

For example, if utilization is spiking on Tuesdays, or if response time issues are occurring daily at 11:00 a.m., the report highlights these events.

ATM Chart Detail Report

The Chart Detail report enables you to perform a trend analysis for network health and performance based on historical virtual circuit health data.

The report displays a comparative analysis of the selected metrics for each time unit.

For example, to compare how the volume of AAL5 CPCS PDUs received and sent was affected by variance in the AAL5 CPCS PDU discards per millisecond for the past one week, you could generate the Weekly ATM PVC Health report for the selected node group.

You can also select two or more nodes, node groups, virtual circuits, or interface types to generate this report.

The report enables you to:

- Analyze the trend of network health and performance for multiple nodes, node groups, virtual circuits, or virtual circuit groups based on one unit of time. Each unit of time is called as a Display Grain. Each Display Grain is measured as follows:
  - 5 minutes for Hourly report
  - 1 hour for daily report
  - One day for weekly report
  - One day for monthly report
- Identify the virtual circuit that is causing ups and downs in network health and performance.
- Detect any persistent problem in virtual circuit health and performance.
- Compare the network health and performance of more than two nodes, node groups, virtual circuits, or virtual circuit groups based on historical virtual circuit health data.

The following filters are available in the Time Controls pane:

- Start Date/Time
- Time Range
- Display Grain
- Hour of day
- Day of Week

Features and Defaults

The graph on this report tracks up to six metrics per axis over the selected time period. The default metrics are the following:

- ATM PVC Name = All
- Metric(s) Shown on Y1 Axis = Volume Bytes (sum)
- Metric(s) Shown on Y2 Axis = CIR Utilization (avg)

The Chart Detail report displays the selected metrics using two Y axes.

- The left Y axis (also known as the Y1 axis) displays the performance of the main metric based on the one you want to generate the report with.
- The right Y axis (also known as the Y2 axis) displays the performance of the metric that should overlay the main (primary) metric.

To add another metric, click **Options** and the **Add New Grouping** button.

To remove a metric you already added, click **Options** and the **Remove Grouping** button.

The Chart Detail report enables you to view the data in the tabular format as well. To view the table, click **Options**, and select Table. The table appears instead of the chart. To view both the chart and the table, click **Options**, and select Chart and Table.

ATM Heat Chart Report

Th Heat Chart report tracks the hourly performance of a single metric. The default metric is Volume - Bytes (sum). The default time period is the last 31 days. Performance is color-coded, making it easy to see whether performance has been satisfactory or unsatisfactory.

Features and Defaults

The legend at the top of the report maps a range of normalized performance values to a particular color.

Beneath the legend, a table represents the normalized values of a performance metric (rows of the table represent hours of the day; columns of the table represent days).

Each cell inside the table is color-coded and indicates a specific value of the metric. You can also hover the mouse over the cell to see the absolute metric value of each hour.

The default topology filters for the report are as follows:

- ATM PVC Name = All
- Time Period = Last 31 days
- Hour of Day = All
- Day of Week = All
- Metric = Volume - Bytes (sum)

Time range options are any period that is not less than 24 hours.

How to Use this Report

Use the Heat Chart report to identify gradual shifts from one range of performance to another range, to spot an isolated instance of poor performance that affected the results for past 24 hours, to spot day-of-week patterns, and to verify that an abnormal condition returned to normal after a problem was corrected.

ATM Managed Inventory Report

The Managed Inventory report enables you to view the number of instances of each topology attribute seen in the collected data within the selected time range. For example, if the report is run for "Last 1 Hour," you would see the number of unique values for each attribute seen in the data collected over the last hour. This report can be useful for checking the number of nodes polled over any given time range.

You can use the available attributes to filter the data and create a report that represents only the elements you are interested in. The report presents the list of attributes in the form of a table. The Count column of the table indicates the number of entries for each attribute. For example, count 5 for the topology item Node Location means that all nodes on your network can be grouped based on five different locations that host the nodes.

You can use the following topology attributes with the virtual circuit Health reports:

- Qualified ATM PVC Name
- ATM PVC Name
- ATM PVC ID
- Qualified Interface Name
- Interface Name
- Interface Alias
- Interface Physical Address
- Interface Annotation
- ATM PVC UUID
- Node Name
- Node Contact
- Node Location
- Node Family
- Node Vendor
- Node ID
- Node UUID
- Node Annotation
- Interface ODBID
- Node ODBID
- Tenant Name
- Tenant UUID
- SecGroup Name
- SecGroup UUID)

The Managed Inventory report can take significant time to build if you select a time range greater than 24 hours.

ATM Most Changed Report

The Most Changed report compares components for two different (consecutive) time periods and ranks them according to the amount of change. The sort order is most-changed to least-changed.

Features and Defaults

This report contains one table, which provides data for one metric only.

The table columns are:

- Grouping by levels: one to five columns, each displaying a level
- Performance for the previous time period
- Performance for the current time period
- Growth, expressed as a percentage increase
- Change

The default filters for the Most Changed report are:

- Grouping by Elements = Qualified ATM PVC Name
- Start Date/Time = depends on default Time Range and data available in database
- Hour of Day (HOD) = All
- Day of Week (DOW) = All
- Ranking Metric = Volume - Bytes (sum)
- Top N Option = Top 10

You can select multiple grouping attributes with the  **Add New Grouping** button. Use the  **Remove Grouping** button to remove a grouping attribute.

How to Use this Report

You can use this report to spot objects at a grouping level that experienced significant growth from the previously selected time period to the currently selected time period. Significant growth could point to a developing problem. You can change the ranking metric and the number of elements listed.

ATM Overview Report

The Overview report displays the utilization and performance of the most commonly monitored metrics in the ATM PVC Health extension pack.

Using this report, you can:

- Monitor the daily utilization and performance of a set of pre-defined metrics.
- Identify the virtual circuits with unusual performance or utilization and drill down to other reports to analyze the problem.
- Rank the virtual circuits according to their utilization levels.

- Identify the metrics that are close to the threshold. Use the following sections to identify such virtual circuits:
  - 12 Weeks CIR In Utilization Forecasts
  - 12 Weeks CIR Out Utilization Forecasts

The default display grain for this report is 1 hour. To select a different time grain or time range, use the Time Controls tab in the navigation panel.

To change the topology filters, use the Topology Filters tab in the navigation panel.

You cannot select the metrics for this report.

ATM Peak Period Report

The Peak Period report ranks the utilization and performance of an interface during the busiest time of the selected time range.

This report enables you to:

- Identify the performance and utilization of the selected metrics during the peak period.
- Identify the interfaces that have the highest or lowest performances or utilization levels during the peak period.
- Compare the performance for multiple interfaces during the peak period using this report.

You can use this report to:

- Identify a group of virtual circuits that have a common network performance problem.
- Identify the virtual circuit that is suffering from a persistent performance problem.
- Identify the period when the virtual circuit utilization was the highest.

Report Options

- **Top / Bottom N**
- **Select Metric(s)**
- **Grouping by Time Period**

This report tracks up to six metrics over the selected time period.

To add another metric, click **Options** and the  **Add New Grouping** button.

To remove a metric you already added, click **Options** and the  **Remove Grouping** button.

To select a range of values for the metric, click  and  .

Type the ranges of metric values the report should consider. Make sure that the ranges are one of the following:

- Decimal multiplier (1 to specify 100%, 0.5 to specify 50%, etc.)
- Range with the % (Percentage) symbol (100%, 50%, etc.)

For example, to see the top five virtual circuits for node 15.2.103.112 with average utilization between 10% and 90%, type the following ranges:

- 0.1 or 10% as **Lowest Value**
- 0.9 or 90% as the **Highest Value**

By default, the report groups data by Qualified ATM PVC Name. You can select multiple grouping attributes using . Use to remove a grouping attribute.

Tips:

- Check this report once a day to see which virtual circuit might need special attention.
- Check this report periodically throughout the day to see which virtual circuit is performing at the extremes and might, therefore, need special attention.

ATM Top N Report

The Top N report ranks network elements by the metric selected. Use this report to spot the element that performed at the extremes and to analyze the historical data for elements that are exhibiting unusual utilization levels.

This report enables you to:

- Detect the ATM virtual circuits that have a health or performance problem.
- Analyze the utilization of the NNMi managed ATM virtual circuits based on a specific time range.
- Detect the over-utilized and under-utilized ATM virtual circuits in the network.
- Compare the performance of multiple ATM virtual circuits for a single node or multiple nodes using this report.

Example

One of the routers in your network is performing poorly. Using this report, you can group the ATM virtual circuit for the router reporting the highest average error rate. That virtual circuit is ranked first.

Interface Health Top N Reports Options

The report displays the following options:

- Top / Bottom N
- Select Metric(s): The report ranks the selected virtual circuits according to the value of the first metric listed in the Select Metric(s) field.
- Display Time Series Chart
- Grouping By

This report tracks up to six metrics for each metric type over the selected time period.

To add another metric, click **Options** and the **Add New Grouping** button.

To remove a metric you already added, click **Options** and the **Remove Grouping** button.

To select a range of values for the metric, click and .

Select a range of metric values the report should consider. Make sure the range is one of the following formats:

- Decimal multiplier (1 to specify 100%, 0.5 to specify 50%, etc.)
- Range with the % (Percentage) symbol (100%, 50%, etc.)

For example, to see the top five interfaces for the node 15.2.103.112, where average utilization is between 10% and 90%, enter the following ranges:

- 0.1 or 10% as **Lowest Value**
- 0.9 or 90% as the **Highest Value**

By default, the report groups data by Qualified ATM PVC Name. You can select multiple grouping attributes with the  button. Use the  button to remove a grouping attribute.

The Time Series Chart report displays the selected metrics using two Y axes.

- The left Y axis (the Y1 axis) displays the performance of the main metric on which you want to generate the report.
- The right Y axis (the Y2 axis) displays the performance of the metric that should overlay the main (primary) metric.

By default, the Top N Report does not display the Time Series Chart. To view the chart with the detail table:

- Select **Options** > **Display Time Series Chart** > **Confirm Selection**.
- Click **Show Chart** link below the detail table.

Tips:

Check this report once a day to see which network interface might need special attention.

Check this report periodically throughout the day to see which network interfaces are performing at the extremes and might need special attention.

ATM Top N Chart Report

The Top N Chart report ranks the ATM virtual circuits by the metric you select.

This report enables you to:

- Spot the virtual circuits that perform at the extremes.
- Analyze historical data for virtual circuits that exhibite unusual utilization levels.
- Detect virtual circuits that have a health or performance problem.
- Analyze the utilization of the NNMi managed ATM virtual circuits based on a specific time range.
- Detect the over-utilized and under-utilized ATM virtual circuits in the network.
- Detect the underlying reason of a persistent problem with a virtual circuit. You can compare the performance for multiple virtual circuits using this report.

Chart Options

The Top N Chart displays the following options:

- **Top / Bottom N**
- **Select Metric(s)**
- **Grouping By**

This report tracks up to six metrics over the selected time period.

To add another metric, click **Options** and the **Add New Grouping** button.

To remove a metric you added previously, click **Options** and the **Remove Grouping** button.

To select a range of value for the metric, click and .

Select a range of metric values the report should consider. Make sure the ranges are one of the following:

- Decimal multiplier (1 to specify 100%, 0.5 to specify 50%, etc.)
- Range with the % (Percentage) symbol (100%, 50%, etc.)

For example, to see the top five ATM virtual circuits for node 15.2.103.112 with average utilization between 10% and 90%, type the following ranges:

- 0.1 or 10% as **Lowest Value**
- 0.9 or 90% as the **Highest Value**

By default, the report groups data by Qualified ATM PVC Name. You can select multiple grouping attributes using . Use to remove a grouping attribute.

The Top N Chart report displays the selected metrics using two Y axes.

- The left Y axis (the Y1 axis) displays the performance of the main metric based on which you want to generate the report.
- The right Y axis (the Y2 axis) displays the performance of the metric that should overlay the main (primary) metric.

Tips:

- Check this report once a day to see which interface may need special attention.
- Check this report periodically throughout the day to see which interfaces are performing at the extremes and may need special attention.

ATM Top N CSV Report

The Top N CSV report can have performance problems when it retrieves a huge amount of data from the NPS database for the selected time range. You can, however, schedule the following reports in CSV format:

- Top N CSV report: Ranks the selected topology element according to the utilization level of the selected metric in the descending order.
- Top N Detail CSV report: Lists metric utilization for the selected topology element according to the selected time grain.

This report displays the ranks of the elements based on total metric utilization for the selected time range and breaks up the metric utilization value for each time grain. For example, you could select the following options:

- Time Range: Last 24 Hours. The default Display Grain is 1 hour.
- Topology Element: Qualified ATM Pvc Name
- Metric: Volume – Bytes (sum) and Utilization (avg)

The displayed report ranks the Qualified ATM Pvc Names based on the metric Volume–Bytes (sum). The Qualified ATM Pvc Name with the highest volume of data passing through it receives the highest rank. The Top N Detail CSV report then calculates and lists the volume of data passed through this element every hour in past 24 hours.

Glossary of ATM Metrics

Available only on ATM interfaces

Metric Name	Description
AAL5 VCC PDUs In	Total number of 32-bit and 64-bit AAL5 CPCS (Common Part Convergence Sublayer) PDUs received on the selected AAL5 VCC (virtual circuit) at the selected AAL5 interface
AAL5 VCC PDUs Out	Total number of 32-bit and 64-bit AAL5 CPCS PDUs transmitted on the selected AAL5 virtual circuit at the selected AAL5 interface
Discarded AAL5 VCC PDUs	Total number of AAL5 CPCS PDUs dropped at the receive side and transmit side of the selected AAL5 VCC at the selected AAL5 interface Calculated using the following formula: `([VCC Discarded AAL5 PDUs In] + [VCC Discarded AAL5 PDUs Out])`
Discarded AAL5 VCC PDUs Percentage	Percentage of AAL5 CPCS PDUs dropped from the total number of AAL5 CPCS PDUs received and transmitted on the selected AAL5 VCC Calculated using the following formula: `([VCC Discarded AAL5 PDUs In]+ [VCC Discarded AAL5 PDUs Out])/(([VCC AAL5 PDUs Out + VCC Discarded AAL5 PDUs Out])+([VCC AAL5 PDUs Out + VCC Discarded AAL5 PDUs Out]))/100`
Discarded AAL5 VCC PDUs In	Total number of AAL5 CPCS PDUs dropped at the receive side of the selected AAL5 VCC at the selected AAL5 interface

Discarded AAL5 VCC PDUs In Percentage	Percentage of AAL5 CPCS PDUs dropped from the total number of AAL5 CPCS PDUs received Calculated using the following formula: `[VCC Discarded AAL5 PDUs In]/([VCC AAL5 PDUs In + VCC Discarded AAL5 PDUs In])`
Discarded AAL5 VCC PDUs Out	Total number of AAL5 CPCS PDUs dropped at the transmit side of the selected AAL5 VCC at the selected AAL5 interface
Discarded AAL5 VCC PDUs Out Percentage	Percentage of AAL5 CPCS PDUs dropped from the total number of AAL5 CPCS PDUs transmitted Calculated using the following formula: `[VCC Discarded AAL5 PDUs Out]/([VCC AAL5 PDUs Out + VCC Discarded AAL5 PDUs Out])`
AAL5 VCC In Octets	Total number of 32 bit and 64 bit AAL5 CPCS PDU octets received on the selected AAL5 virtual circuit at the selected AAL5 interface
AAL5 VCC Out Octets	Total number of 32-bit and 64-bit AAL5 CPCS PDU octets transmitted on the selected AAL5 virtual circuit at the selected AAL5 interface
AAL5 VCC In Utilization	Average utilization for the selected virtual circuit Calculated using the following formula: `([Number of octets received by the AAL5 VCC] * 8 * 100)/([Interface in speed] * Number of seconds the AAL5 interface was available)`
AAL5 VCC Out Utilization	Average utilization for the selected virtual circuit Calculated using the following formula: `([Number of octets transmitted by the AAL5 VCC] * 8 * 100)/([Interface out speed] * Number of seconds the AAL5 interface was available)`
Reboot (avg)	Generated if the selected AAL5 interface was restarted during the poll and no data could be retrieved from the interface NNMi checks the sysUptime metric to determine whether the interface was restarted during the last poll.
Unresponsive Target (avg)	Generated when the SNMP agent did not respond when collecting metrics for a particular polling policy
Invalid Data (avg)	Generated when NNMi successfully polls data from the target, but determines that the data is invalid. For example, this metric is calculated when the number of packets is greater than the number of octets.
Target Error (avg)	Generated if the selected AAL5 interface returns any of the following SNMP error

	responses: • Authentication error • No such name • No such object

About Reportlets

In a large enterprise network, the NNM iSPI Performance products (HP NNM iSPI Performance for Metrics, HP NNM iSPI Performance for Quality Assurance, and HP NNM iSPI Performance for Traffic) can produce a large amount of data and large cardinality. Enterprise networks often have a very large number of unique IP addresses, source nodes, destination nodes, virtual circuits, interfaces, and components that each produce a large amount of data. Generating reports can therefore be time-consuming.

Reportlets enable you to generate quick impressions of the larger reports using the NNM iSPI Performance dashboard.

To display the reportlets:

1. Log on to the NPS home page.
2. On the left navigation panel, select **Dashboard Reportlets**.
3. Select an extension pack and a reportlet.

You can also create custom dashboards using the reportlets.

Simple Bar Chart

Compares the performance of two metrics for the selected time range.

Enables you to:

- Compare the performance trends of multiple metrics.
- Analyze how the value of the secondary metric increases or decreases based on the increase or decrease in the value of the primary metric.

This reportlet supports two metrics.

To select a new metric for your reportlet, see Change Reportlet Options in the *Using Reports* > *Change Default Settings* section.

Simple Bar and Line Chart

Displays the performance trend of ATM PVC Health virtual circuits for the past 24 hours using the following values:

- **Primary Metric** on the bar chart
- **Secondary Metric** on the line chart

Enables you to:

- Compare the performance trends of multiple metrics.
- Analyze how the value of the secondary metric increases or decreases based on the increase or decrease in the value of the primary metric.

This reportlet supports two metrics.

To generate a reportlet with the metrics of your choice, click  **Show Toolbar** and  **Options**.

Calendar

Displays a comparative study of the selected **Primary Metric** and **Secondary Metric**

The default display grain is set to 1 hour. You cannot change the display grain of this reportlet.

Enables you to monitor the following:

- Daily CIR or EIR utilization for the selected ATM PVC Health virtual circuits
- Volume of data passed through the virtual circuit for past 24 hours
- Performance of the virtual circuit for past 24 hours

This reportlet supports two metrics.

To generate a reportlet with the metrics of your choice, click  **Show Toolbar** and  **Options**.

Gauge

Evaluates the metric for the selected point of time.

Select only the metrics that display the percentage values.

Enables you to:

- Measure the daily performance of the selected metric.
- Detect any abnormal or unexpected performance level.

This reportlet supports one metric.

When the NPS database has no data, the needle icon on the gauge does not appear.

To generate a reportlet with the metrics of your choice, click  **Show Toolbar** and  **Options**.

Heat Chart

Grades the performance of the selected metric for the selected time range.

The metric performance is aggregated according to an hourly display grain.

Enables you to:

- View how the performance of the selected ATM PVC Health virtual circuits is affected by a varying metric.
- Compare the hourly performance of the selected metric.
- Detect the time range when the performance of the selected ATM PVC Health virtual circuits is affected adversely because of the fluctuating metric value.

This reportlet supports one metric.

To generate a reportlet with the metrics of your choice, click **Show Toolbar** and **Options**.

Metric Snapshot

Displays the metric performance for the selected time range.

Enables you to:

- Build a performance history for the selected metric and analyze how the metric performance changes over time. The history can help you determine the baseline value for the metric.
- Compare the performance of multiple metrics over a specified time range. You can generate a snapshot report for a single metric, save the snapshot report for various metrics, and compare the performance of each metric over a time range.

This reportlet supports one metric.

To generate a reportlet with the metrics of your choice, click **Show Toolbar** and **Options**.

Most Changed

Compares the metric performance between the following:

- Selected time range
- Period preceding the selected time range

Aggregates metric utilization and ranks performance in descending order.

Enables you to:

- Measure performance fluctuations for ATM PVC Health virtual circuits.
- Detect the top N ATM PVC Health virtual circuits that have a common performance or utilization problem.

You can enhance the reportlet usability using the following features:

- **Top / Bottom N**
- **Grouping By**

This reportlet supports one metric.

To generate a reportlet with the metrics of your choice, click **Show Toolbar** and **Options**.

Multimetric Chart

Analyzes the performance trend for the selected metrics for the selected time range.

Enables you to:

- Perform a comparative analysis of the selected metrics for each display grain. The default display grain is 1 hour.
- Analyze the reason for ups and downs in the performance of the selected ATM PVC Health virtual circuits.
- Detect any persistent problem in the performance of the ATM PVC Health virtual circuits.

This reportlet supports up to six metrics.

To generate a reportlet with the metrics of your choice, click **Show Toolbar** and **Options**.

Simple Chart

Analyzes the utilization trend for the selected metrics for the selected time range.

Enables you to:

- Perform comparative analysis of the selected metrics for each display grain. The default display grain is 1 hour.
- Analyze the reason for ups and downs in the performance of the selected ATM PVC Health virtual circuits.
- Detect any persistent problem in the performance of the selected ATM PVC Health virtual circuits

This reportlet supports two metrics.

To generate a reportlet with the metrics of your choice, click **Show Toolbar** and **Options**.

Simple Table

Analyzes the utilization trend for the selected metrics for the selected time range.

The default display grain is 1 hour.

Enables you to:

- Analyze the hourly performance of the metrics.
- Detect any abnormal or unexpected performance for the selected ATM PVC Health virtual circuits.
- Analyze how the value of the secondary metric increases or decreases based on the increase or decrease in the value of the primary metric.

This reportlet supports up to six metrics.

To generate a reportlet with the metrics of your choice, click **Show Toolbar** and **Options**.

Sparkline

Evaluates the trend of how the selected metric value has changed for the selected time range.

Enables you to:

- Analyze variations in performance for the selected metric.
- Determine whether the expected behavior for the selected metric should be reassessed.

This reportlet supports one metric.

To generate a reportlet with the metrics of your choice, click **Show Toolbar** and **Options**.

Top N Chart

Ranks the individual contribution of each metric for the performance of the selected ATM PVC Health virtual circuits for the selected time range.

Performance of the interface is aggregated on an hourly basis.

Enables you to:

- Spot the virtual circuits for which the performance metrics present extreme values.
- Investigate the aggregated data for the virtual circuits that exhibit unusual utilization levels.
- Select the metric on which to generate the report. The metric you select is used to rank the virtual circuits.
- Group the report data based on a specific parameter. To add a subgroup, click **Add Group**.

This reportlet supports one metric.

To generate a reportlet with the metrics of your choice, click **Show Toolbar** and **Options**.

Top N Line Chart

Ranks the utilization trend for the selected metrics for the selected time range.

The performance of the virtual circuits is aggregated on an hourly basis.

Enables you to:

- Spot the virtual circuits for which the performance metrics present extreme values.
- Investigate the aggregated data for the virtual circuits that exhibit unusual utilization levels.
- Select the metric on which to generate the report. The metric you select is used to rank the virtual circuits.
- Group the report data based on a specific parameter. To add a subgroup, click **Add Group**.

This reportlet supports one metric.

To generate a reportlet with the metrics of your choice, click **Show Toolbar** and **Options**.

Top N Stacked Chart

Ranks the individual contribution of each virtual circuit based on the selected metrics.

The performance of each interface is aggregated for the default display grain of 1 hour.

Enables you to:

- Spot the virtual circuits for which the performance metrics present extreme values.
- Investigate the aggregated data for virtual circuits that exhibit unusual utilization levels.
- Detect the network paths that have a common network performance problem.

This reportlet supports up to six metrics.

To generate a reportlet with the metrics of your choice, click **Show Toolbar** and **Options**.

Top N Table

Ranks the interfaces based on the selected metric.

Enables you to:

- Spot the virtual circuits for which the performance metrics present extreme values.
- Investigate the aggregated data for virtual circuits that exhibit unusual utilization levels.
- Select the metric on which to generate the report. The metric you select is used to rank the virtual circuits.
- Group the report data based on a specific parameter. To add a subgroup, click **Add Group**.

This reportlet supports up to six metrics.

To generate a reportlet with the metrics of your choice, click **Show Toolbar** and **Options**.

Top N Table with Bars

Ranks the ATM PVC Health virtual circuits based on the selected metric, and displays a horizontal bar depicting the aggregated metric value.

Enables you to:

- Spot the virtual circuits for which the performance metrics present extreme values.
- Investigate the aggregated data for virtual circuits that exhibit unusual utilization levels.
- Select the metric on which to generate the report. The metric you select is used to rank the virtual circuits.
- Group the report data based on a specific parameter. To add a subgroup, click **Add Group**.

This reportlet supports up to six metrics.

To generate a reportlet with the metrics of your choice, click **Show Toolbar** and **Options**.

About Component Health Reports

Component Health reports show performance data for network components in your environment. Graphs and charts on these reports reflect details for the following device elements:

- CPU
- Memory
- Buffer
- SNMP response time

Use Component Health reports to determine if a component is over-utilized or needs an upgrade.

Opening Reports from NNMi

If you are interested in a particular component, you can launch a pre-filtered report from NNMi. Or you can open a workspace view from NNMi, move to the iSPI, and begin your investigation from the Report menu.

To move from NNMi to the iSPI:

1. Log in to the NNMi console.
2. Select a workspace.

3. Open a view (nodes, interfaces, components, or incidents).
4. Select **Actions** > **HP NNM iSPI Performance** > **Reporting - Report Menu**.

Component Health Baseline Sleeve Report

This report analyzes how close the metric performance value is to the threshold levels. It enables you to analyze when the metric will reach the threshold. You can:

- Analyze if the component utilization is within the expected (normal) range for the selected time range.
- Detect if the metric performance is about to cross the high and low thresholds.

  For example, if you generate the Baseline Sleeve Chart report for the baseline metric Memory Utilization, the chart displays the how close the baseline buffer utilization is to the high and low threshold.
- Save multiple Baseline Sleeve Reports for a specific metric for different time ranges, and analyze the metric performance trend.

This report supports one metric.

Component Health Calendar Report

This report uses a traditional, calendar-style layout to show hourly statistics for two metrics in a single extended graph that spans multiple days.

The report default values are the following:

- Nodes/Components = All
- Dates/Times = Last 1 hour
- Metric(s) Shown on Y1 Axis = Memory Utilization (avg)
- Metric(s) Shown on Y2 Axis = CPU 1 min Utilization (avg)

The default view shows data for the current month. Depending on how long the iSPI has been collecting data from NNMi, you could see data for a longer time period.

If you set the Time Range to less than 24 hours, the following message appears:

```
This report is not designed to operate with a time range of less than
24 hours. Please modify your time selections.
```

You can use the following time control parameters:

- Start Date/Time
- Time Range
- Auto Refresh

Use this report to:

- Observe gradual trends over time
- Spot isolated spikes

- Verify that an abnormal condition has returned to normal
- Make comparisons

For example, you could compare the data for the past month with data for the preceding month.

The report reveals:

- Day of week patterns
- Hour of day patterns

For example, if utilization spikes on Tuesdays, or response time issues occur each day at 11:00 a.m., the report highlights those events.

Component Health Chart Detail Report

This report enables you to perform a trend analysis for network health and performance based on historical component health data. It displays a comparative analysis of the selected metrics for each time unit.

For example, to compare how the average Threshold Exception Rate was affected by variance in the average SNMP Response Time per millisecond for the past week, you could generate the Weekly Component Health report for the selected node group.

You can also select two or more component or component groups.

You can:

- Analyze the trend of network health and performance for multiple components or component groups based on one unit of time. Each unit of time is called a display grain. Each display grain is measured as follows:
  - 5 minutes for Hourly report
  - 1 hour for daily report
  - One day for weekly report
  - One day for monthly report
- Analyze the reason for any ups and downs in network health and performance.
- Detect any persistent problem in network health and performance.
- Compare the network health and performance of more than two components or component groups based on historical component health data.

The default report values are the following:

- Metric(s) Shown on Y1 Axis = Memory Utilization (avg)
- Metric(s)S Shown on Y2 Axis = CPU 1 min Utilization (avg)

Chart or Table: To view the table, click **Options** and select **Table**. To view both the chart and the table, click **Options** and select **Chart and Table**.

The report displays the selected metrics using two Y axes.

- The left Y axis (the Y1 axis) displays the performance of the main metric on which you want to generate the report.

- The right Y axis (the Y2 axis) displays the performance of the metric that should overlay the main (primary) metric.

To add another metric, click **Options** and the  button.

To remove a metric, click **Options** and the  button.

Component Health Dashboard Report

The Dashboard report provides an overview of the components available on your network using a combination of gauges, heat charts, and ordered Top 5 lists. It displays threshold violations for volume, error, and availability. Threshold violations can point to a network-related problem or indicate that your thresholds within NNMi need to be changed.

To group the data within the dashboard:

1. Click **Options**.
2. In the Grouping By field, select a topology filter to group the dashboard data.

   For example, if you use a grouping option of Node Name, all Availability exceptions that fall within the time and topology constraints are grouped by Node Name and displayed as a percentage of the total samples in the left gauge.

Dashboard Sections

Gauge: The gauges provide the following exception count statistics:

- Memory Utilization Exceptions (% samples)
- Buffer Utilization Exceptions (% samples)
- Buffer Miss Rate Exceptions (% samples)
- CPU Utilization Exceptions (% samples)

When the NPS database has no data, the needle icons on the gauges on the Dashboard report do not appear.

Top 5 Lists: These lists display the nodes responsible for the exceptions that show up in the gauges:

- Top 5 Qualified Component Names by Memory Utilization Exceptions
- Top 5 Qualified Component Names by CPU Utilization Exceptions

Top 5 Qualified Component Names by Buffer Utilization Exceptions and Buffer Utilization Heat Chart: Enables you to:

- Analyze the pattern of buffer utilization exception for the past hour.
- Compare the buffer utilization performance of different components.
- Detect the time range in the past hour when the buffer utilization performance was the lowest.

If the gauges are showing few or no exceptions, none of your nodes, including the nodes in the Top 5 lists, are experiencing problems with memory, buffer, or CPU utilization.

For example, say that your network is divided into groups that represent regions or strategic locations for your enterprise. With the grouping option set to Node Group name, the report lists each

of your strategic Node Groups (as defined within NNMi) and provides the current statistics for exceptions within each group.

If an unexpected change in exception counts is noted, you can click the appropriate gauge needle or Node Group within the Top 5 lists and launch another report (such as Chart Detail) to investigate trends or changes within the network as they occur.

The thresholds that create exceptions are set from NNMi, not from the iSPI. To set or modify thresholds, refer to the online help for NNMi administrators.

Component Health Executive Report

This report provides a broad view of component performance for the selected time range, using the following graphs:

- Average Memory Utilization and Exception Percentage
- Average Backplane Utilization and Exception Percentage
- Average Buffer Utilization and Exception Percentage
- Maximum Rate of Buffer Miss, Buffer Failure, and No Memory Exceptions
- Average 1 minute CPU Utilization and Exception Percentage
- Average Disk Space Utilization and Exception Percentage

You can:

- View every aspect of performance at once.
- View trends and verify that performance is meeting expectations.
- Identify isolated aberration in the graphs and detect any unexpected performance trend.

The report does not provide options to create graphs based on other metrics.

The default display grain is 1 hour.

The report shows data for exceptions only if thresholds for performance metrics are set in NNMi.

Component Health Headline Report

This report provides a broad view of component performance for the selected time range, using the following graphs:

- Average availability and reachability for the selected node
- Maximum, average, and minimum ICMP response time in milliseconds
- Average Memory Utilization and Exception Percentage (displayed as a percentage of the total samples collected during the selected time range)
- Average Backplane Utilizationand Exception Percentage
- Average Buffer Utilization and Exception Percentage (displayed as a percentage of the total samples collected during the selected time range)
- Maximum Rate of Buffer Miss, Buffer Failure, and No Memory Exceptions
- Average 1 minute CPU Utilization and Exception Percentage (displayed as a percentage of the

total samples collected during the selected time range)

- Average Disk Space Utilization and Exception Percentage (displayed as a percentage of the total samples collected during the selected time range)

The default time range for this report is 24 hours.

You can:

- View every aspect of performance at once.
- View trends and verify that performance is meeting expectations.
- Identify isolated aberration in the graphs and detect any unexpected performance trend.

The report does not provide options to create graphs based on other metrics.

The report shows data for exceptions only if thresholds for performance metrics are set in NNMi.

Component Health Heat Chart Report

This report tracks the hourly performance of a single metric. The default metric is Memory Utilization (avg). The default time period is the last 31 days. Performance is color-coded, making it easy to spot a condition that is gradually worsening and to distinguish satisfactory performance from unsatisfactory performance.

The legend at the top of the report maps a range of normalized performance values to a particular color.

Beneath the legend, a table represents the normalized values of a performance metric, with rows representing hours of the day and columns representing days.

Each cell inside the table is color-coded and indicates a specific value of the metric. You can hover the mouse pointer on the cell to see the absolute metric value of each hour.

The defaults are:

- Nodes/Components = All
- Time Period = Last 31 days
- Hour of Day = All
- Day of Week = All
- Metric = Memory Utilization (avg)

When selecting the time controls parameters, choose from the following values:

- A specific day other than Last Day
- A specific week this month (or partial week)
- A specific week in a previous month (or partial week)
- Last 31 days
- A previous month

If you set the time range to less than 24 hours, the following message appears:

```
This report is not designed to operate with a time range of less than
24 hours. Please modify your time selections.
```

The report tracks percentages. If you open the Heat Chart from a report that is using a non-supported metric (for example, Sample Count or Response Time), you will be told to open the report controls window and select an alternate metric.

You can:

- Identify gradual shifts from one range of performance to another range.
- Spot an isolated instance of poor performance that affected the results for one day.
- Spot day-of-week or hour-of-day patterns.
- Verify that an abnormal condition returned to normal after a problem was corrected.

Component Health Managed Inventory Report

This report enables you to view the number of instances of each topology attribute seen in the collected data within the selected time range. For example, if the report is run for Last 1 Hour, you will see the number of unique values for each attribute seen in the data collected over the past hour. This report can be useful, for example, for checking the number of nodes polled over any given time range.

You can use the available attributes to filter the data of your interest and create a report that represents only the elements of your interest. The report presents the list of attributes in the form of a table, with the Count column indicating the number of entries for each attribute. For example, count 5 for the topology item Node Location means that all nodes on your network can be grouped based on five different locations that host the nodes.

You can use the following topology attributes with Component Health reports:

- Qualified Component Name
- Component Name
- Component Type
- Component ID
- Component UUID
- Node Name
- Node Contact
- Node Location
- Node Family
- Node Vendor
- Node ID
- Node UUID
- Node Annotation
- Interface Annotation

The report can take significant time to build if you select a time range greater than one day.

Component Health Most Changed Report

This report compares performance of the components for two different (consecutive) time periods and ranks components by the amount of change. The sort order is most-changed to least-changed.

The report contains one table with the following columns:

- Component
- Performance for the previous time period
- Performance for the selected time period
- Growth, expressed as a percentage increase
- Change

The report defaults to:

- Grouping by Elements = Qualified Component Name
- Start Date/Time = Depends on default Time Range and data available in the database
- Time Range = Last 1 hour
- Hour of Day = All
- Day of Week = All
- Rank Metric = Memory Utilization (Avg%)
- Top N Option = Top 10

The report groups data by Qualified Component Name. You can select multiple grouping attributes using the  (**Add New Grouping**) button. To remove a grouping attribute, use the  (**Remove Grouping**) button.

Use this report to identify components that experienced significant change from one time period to the next. Significant change could point to a developing problem. The report shows the rate of change in the Growth Rate column. You can change the ranking metric and how many elements are listed.

Component Health Overview Report

The Overview report displays the utilization and performance of the most commonly monitored metrics in the Component Health extension pack.

You can:

- Monitor the daily utilization and performance of a set of pre-defined metrics.
- Identify the components with unusual performance or utilization and drill down to other reports to analyze the problem.
- Rank the components based on their utilization levels.
- Identify the metrics that are close to the threshold. Use the following sections to identify such components:

- Top 10 CPU Forecasts
- Top 10 Memory Forecasts

The default display grain is 1 hour. To select a different time grain or time range, use the Time Controls tab in the navigation panel.

You cannot select the metrics for this report.

Component Health Peak Period Report

This report ranks the utilization and performance of a component during the busiest time of the selected time range.

You can:

- Identify the performance and utilization of the selected metrics during the peak period.
- Identify the components that have the highest or lowest performances or utilization levels during the peak period.
- Compare the performance for multiple components during the peak period using this report.

Use this report to:

- Identify a group of components or nodes having a common network performance problem.
- Identify the component that is suffering from a persistent performance problem.

Report options:

- Top/Bottom N
- Select Metric(s)
- Grouping by Time Period

To add another metric, click **Options** and the  button.

To remove a metric, click **Options** and the  button.

To select a range of value for the metric, click the  button and  . Select a range of metric value the report should consider.

When specifying the range for a percentage metric, make sure that the ranges are in one of the following formats:

- Decimal multiplier (for example, 1 to specify 100%, 0.5 to specify 50%, etc.)
- Range with the % (Percentage) symbol (for example, 100%, 50%)

For example, to see the top five CPUs with average memory utilization between 10% and 90%, type the following ranges:

- 0.1 or 10% as **Lowest Value**
- 0.9 or 90% as the **Highest Value**

By default, the report groups data by Qualified Component Name. You can select multiple grouping attributes with the  button. To remove a grouping attribute, click the  button.

Tips:

Use this report to identify the period when the component utilization was the highest.

Check this report once a day to see which component might need special attention.

Check this report periodically throughout the day to see which component is performing at the extremes and might need special attention.

Component Health Threshold Sleeve Report

This report analyzes how close the metric performance value is to the threshold levels. It enables you to analyze when the metric will reach the threshold.

You can:

- Forecast over-utilization or under-utilization of the selected component.
- Detect if the metric performance is about to cross the high and low thresholds.

  For example, if you generate the Threshold Sleeve Chart report for Buffer Utilization (avg), the chart displays how close the average buffer utilization is to the high and low threshold.
- Save multiple Threshold Sleeve Reports for a specific metric for different time ranges, and analyze the metric performance trend.

Component Health Top N Chart Report

This report ranks the components by the metric you select. It displays an individual chart for each topology filter and metric selected for the report.

Using this report, you can:

- Spot the component that performed at the extremes.
- Analyze the historical data for components that are exhibiting unusual utilization levels.
- Detect the component having a health or performance problem.
- Analyze the utilization of the NNMi managed components based on a specific time range.
- Detect the over-utilized and under-utilized components in the network.
- Detect the underlying reason of a persistent problem with a component. You can compare the performance for multiple components using this report.

For example, say that some of the routers in your network are performing poorly. You could group the routers that report the highest average response time. The router with the highest response time is ranked first.

Report options:

- Top/Bottom N
- Select Metric(s)
- Grouping By

The report displays the selected metrics using two Y axes.

- The left Y axis (the Y1 axis) displays the performance of the main metric based on which you want to generate the report.
- The right Y axis (the Y2 axis) displays the performance of the metric that should overlay the main (primary) metric.

To add another metric, click **Options** and the  **Add new metric** button.

To remove a metric, click **Options** and the  **Remove metric** button.

To select a range of value for the metric, click the (**Apply Filter** button, and select a range of metric value the report should consider.

While specifying the range for a percentage metric, make sure that the ranges are one of the following formats:

- Decimal multiplier (1 to specify 100%, 0.5 to specify 50%, etc.)
- Range with the % (Percentage) symbol (100%, 50%, etc.)

For example, to see the top five CPUs with average memory utilization between 10% and 90%, type the following ranges:

- 0.1 or 10% as **Lowest Value**
- 0.9 or 90% as the **Highest Value**

By default, the report groups data by Qualified Component Name. You can select multiple grouping attributes with the  button. Use the  button to remove a grouping attribute.

Component Health Top N Report

This report ranks network elements by the metrics you select. Use this report to spot the element that performed at the extremes and to analyze historical data for elements that are exhibiting unusual utilization levels. You can:

- Detect the component that has a health or performance problem.
- Analyze the utilization of the NNMi-managed network components during a specific time range.
- Detect over-utilized and under-utilized components in the network.
- Compare performance for multiple network components.

How to Run the Top N Report

Selecting the Top N report in the Reports pane automatically runs the report. The values selected the previous time the report was run are used. You can change the values with the Options menu and customize the report. The following report options are available:

- Top / Bottom 'N'
- Select Metric(s):
- Display Time Series Chart
- Grouping by:

Report Options

Top / Bottom 'N'

You can select from the following:

Ranking Number	Description
Top 5	
Top 10	
Top 25	
Top 50	
Top 100	
Bottom 5	
Bottom 10	
Bottom 25	
Bottom 100	
Sort All in Descending	
Sort All in Ascending	

Select Metric(s)

You can select up to six metrics for each metric type over the selected time period. To add a metric, click  Add new grouping. To remove a metric, click  Remove metric.

To select a range of values for the metric, click  and Apply Filter, and select a range of metric values the report should consider. Make sure that the ranges are in one of the following formats:

- Decimal multiplier (1 to specify 100%, 0.5 to specify 50%, and so on)
- Range with the % (Percentage) symbol (100%, 50%, and so on)

For example, to see the top five interfaces for node 15.2.103.112, where the average utilization is between 10% and 90%, type the following ranges:

- 0.1 or 10% as **Lowest Value**
- 0.9 or 90% as the **Highest Value**

By default, the report groups data by Qualified Interface Name.

The selected interfaces are ranked according to the value of the first metric listed in the Select Metric(s) field. You can select any of the metrics listed in the two drop-down boxes. The metrics you select are displayed along the two Y axes of the resulting chart.

- The selections you make in the left box appear along the left (Y1) axis of the resulting chart.
- The selections you make in the right box appear along the right (Y2) axis.

A number of metrics provide aggregated (avg, max, min, and percentile) values. Percentiles have the following meaning:

- (pctile05) - 5 percent of samples fall below, and 95 percent fall above.
- (pctile90) - 90 percent of samples fall below, and 10 percent fall above.
- (pctile95) - 95 percent of samples fall below, and 5 percent fall above.
- (pctile99) - 99 percent of samples fall below, and 1 percent fall above.

Display Time Series Chart

Selecting Yes produces a chart that displays the selected metrics along two Y axes.

- The left (Y1) axis displays the performance of the main metric on which you want to generate the report.
- The right (Y2) axis displays the performance of the metric that should overlay the main (primary) metric.

Grouping by:

This option enables you to select a Grouping Attribute. The selections are the following.

Grouping Attribute	Description
NodeGroup Name	
Qualified Component Name	
Component Name	
Component Type	
Component UUID	
Node Name	
Node Short Name	
Node Contact	
Node Location	
Node Family	
Node Vendor	
Node UUID	
Node ODBID	
Tenant Name	
Tenant UUID	
SecGroup Name	
SecGroup UUID	
Node Annotation	

You can add another grouping by clicking the  Add new grouping button.

When your report completes, you can save it as a Report View. To save it, click the **Keep this version** drop-down list and select **Save as Report View**. The Save as report view window opens. You can specify a name and location. When done, click **OK**.

Tips:

Check this report once a day to see which network component might need special attention.

Check this report throughout the day to see which network components are performing at the extremes and might need special attention.

About Reportlets

In a large enterprise network, the NNM iSPI Performance products (HP NNM iSPI Performance for Metrics, HP NNM iSPI Performance for Quality Assurance, and HP NNM iSPI Performance for Traffic) can produce a large amount of data and large cardinality. Enterprise networks often have a very large number of unique IP addresses, source nodes, destination nodes, virtual circuits, interfaces, and components that each produce a large amount of data. Generating reports can therefore be time-consuming.

Reportlets enable you to generate quick impressions of the larger reports using the NNM iSPI Performance dashboard.

To display the reportlets:

1. Log on to the NPS home page.
2. On the left navigation panel, select **Dashboard Reportlets**.
3. Select an extension pack and a reportlet.

You can also create custom dashboards using the reportlets.

Simple Bar Chart

Compares the performance of two metrics for the selected time range.

Enables you to:

- Compare the performance trends of multiple metrics.
- Analyze how the value of the secondary metric increases or decreases based on the increase or decrease in the value of the primary metric.

This reportlet supports two metrics.

Simple Bar and Line Chart

Displays the trend of component performance for the past one day using the following values:

- Primary Metric on the bar chart
- Secondary Metric on the line chart

Enables you to:

- Compare the performance trends of multiple metrics.
- Analyze how the value of the secondary metric increases or decreases based on the increase or decrease in the value of the primary metric.

This reportlet supports two metrics.

Baseline Sleeve Chart

Analyzes how close the metric performance value is to the threshold levels.

Enables you to:

- Detect if the metric performance is about to cross the high and low thresholds.

  For example, if you generate the Baseline Sleeve Chart reportlet for Utilization (avg), the chart displays how many exceptions are raised on average utilization in the past one day,
- Save multiple Sleeve Reports for a time range, and for analyze the trend of performance for the metric.

This reportlet supports one metric.

Baseline Metric Snapshot with Range

Displays the aggregated metric performance for the selected time range.

Enables you to:

- Build a performance history for the selected baseline metric and analyze how the metric performance changes over time.

  Such history may help you to select an expected performance level for the metric
- Compare the performance for multiple metrics over a specified time range.

  Though you can generate snapshot report for a single metric, you can save the snapshot report for various metrics and compare the performance of each metric over a time range.

This reportlet supports one metric.

Baseline Sparkline

Evaluates the trend of how the selected baseline metric value has changed for the selected time range.

Enables you to:

- Analyze the variations in the performance for the selected metric.
- Decide whether the expected behavior for the selected metric should be reassessed.

This reportlet supports one metric.

Baseline Sparkline with Range

Evaluates the trend of how the selected baseline metric value has changed for the selected time range.

Enables you to:

- Evaluate the performance trend of the selected metric for the selected time range.
- Compare the present performance trend with the normal (expected) performance range.
- Measure the performance of past one day in percentage.

This reportlet supports one metric.

Calendar

Displays a comparative study of the selected Primary Metric and Secondary Metric.

The default display grain is set to 1 hour. You cannot change the display grain of this reportlet.

Enables you to monitor:

- Daily component utilization
- Volume of data passed through the component for the past one day
- Performance of the component for the past one day

Supports two metrics.

Gauge

Evaluates the metric for the selected point of time.

Select only the metrics that displays the percentage values.

Enables you to:

- Measure the daily performance of the selected metric.
- Detect any abnormal or unexpected performance level.

This reportlet supports one metric.

When the NPS database has no data, the needle icon on the gauge does not appear.

Heat Chart

Grades the performance of the selected metric for the selected time range.

The metric performance is aggregated based on an hourly display grain.

Enables you to:

- View how the component performance gets affected by a varying metric.
- Compare the hourly performance of the selected metric.
- Detect the time range when the component performance was affected adversely because of the fluctuating metric value.

This reportlet supports one metric.

Metric Snapshot

Displays the metric performance for the selected time range.

Enables you to:

- Build a performance history for the selected metric and analyze how the metric performance changes over time.

  Such history may help you to decide the baseline value for the metric

- Compare the performance for multiple metrics over a specified time range.

  Though you can generate snapshot report for a single metric, you can save the snapshot report for various metrics and compare the performance of each metric over a time range.

This reportlet supports one metric.

Most Changed

Compares the metric performance between the following:

- Selected time range
- Period preceding the selected time range

Aggregates the metric utilization and ranks the performance in a descending order.

Enables you to:

- Measure the performance fluctuations for the components.
- Detect the top N components having a common performance or utilization problem.

You can enhance the report usability using the following features:

- Top / Bottom N
- Grouping By

This reportlet supports one metric.

Multimetric Chart

Analyzes the performance trend for the selected metrics for the selected time range.

Enables you to:

- Perform comparative analysis of the selected metrics for each display grain.

  The default display grain is one hour.

- Analyze the reason for any ups and downs in the component performance.
- Detect any persistent problem in the component performance.

This reportlet supports up to six metrics.

Simple Chart

Analyzes the utilization trend for the selected metrics for the selected time range.

Enables you to:

- Perform comparative analysis of the selected metrics for each display grain.

  The default display grain is one hour.

- Analyze the reason for any ups and downs in the component performance.
- Detect any persistent problem in the component performance.

This reportlet supports two metrics.

Simple Table

Analyzes the utilization trend for the selected metrics for the selected time range.

The default display grain is one hour.

Enables you to:

- Analyze the hourly performance of the metrics.
- Detect any abnormal or unexpected component performance.
- Analyze how the value of the secondary metric increases or decreases based on the increase or decrease in the value of the primary metric.

This reportlet supports up to six metrics.

Sparkline

Evaluates the trend of how the selected metric value has changed for the selected time range.

Enables you to:

- Analyze the variations in the performance for the selected metric.
- Decide whether the expected behavior for the selected metric should be reassessed.

This reportlet supports one metric.

Threshold Sleeve Chart

Analyzes how close the metric performance value is to the threshold levels.

Enables you to:

- Detect if the metric performance is about to cross the high and low thresholds.

  For example, if you generate the Exception Sleeve Chart reportlet for Utilization (avg), the chart displays how many exceptions are raised on average utilization in the past one day,
- Save multiple Sleeve Reports for a time range, and analyze the trend of performance for the metric.

This reportlet supports one metric.

Top N Chart

Ranks the individual contribution of each metric for the component performance for the selected time range.

The performance of the component is aggregated on hourly basis.

Enables you to:

- Spot the components for which the performance metrics present extreme values.
- Investigate the aggregated data for the components that are exhibiting unusual utilization levels.
- Select the metric based on which you want to generate the report. The metric that you select is used to rank the components.
- Group the report data based on a specific parameter. To add a subgroup, click the  **Add Group** button.

This reportlet supports one metric.

Top N Line Chart

Ranks the utilization trend for the selected metrics for the selected time range.

The performance of the component is aggregated on hourly basis.

Enables you to:

- Spot the components for which the performance metrics present extreme values.
- Investigate the aggregated data for the components that are exhibiting unusual utilization levels.
- Select the metric based on which you want to generate the report. The metric that you select is used to rank the components.
- Group the report data based on a specific parameter. To add a subgroup, click the  **Add Group** button.

This reportlet supports one metric.

Top N Stacked Chart

Ranks the individual contribution of each component based on the selected metrics.

The performance of each component is aggregated for the default display grain of one hour.

Enables you to:

- Spot the components for which the performance metrics present extreme values.
- Investigate the aggregated data for the components that are exhibiting unusual utilization levels.
- Detect the network path having a common network performance problem.

This reportlet supports up to six metrics.

Top N Table

Ranks the components based on the selected metric.

Enables you to:

- Spot the components for which the performance metrics present extreme values.
- Investigate the aggregated data for the components that are exhibiting unusual utilization levels.
- Select the metric based on which you want to generate the report. The metric that you select is used to rank the components.

- Group the report data based on a specific parameter. To add a subgroup, click the **Add Group** button.

This reportlet supports up to six metrics.

Top N Table with Bars

Ranks the components based on the selected metric and displays a horizontal bar to depict the aggregated metric value.

Enables you to:

- Spot the components for which the performance metrics present extreme values.
- Investigate the aggregated data for the components that are exhibiting unusual utilization levels.
- Select the metric based on which you want to generate the report. The metric that you select is used to rank the components.
- Group the report data based on a specific parameter. To add a subgroup, click the **Add Group** button.

This reportlet supports up to six metrics.

Calculating Node Availability

NPS calculates node availability af follows:

1. NNMi polls the SNMP sysUpTime value for each managed node and passes the sysUpTime value to NPS.
2. NPS calculates the number of seconds the node was available for polling using the following formula:
   - If a node is reachable and the SNMP agent responds with the sysUpTime during the polling interval:

     Available Seconds = Delta Time = delta sysUpTime

     This formula is applied only when the sysUpTime counter is not reset, and delta sysUpTime is greater than or equal to the elapsed clock time since the last successful sysUpTime poll.
   - If node sysUpTime was reset, or delta sysUpTime is less than the elapsed clock time since the last successful poll:

     Available Seconds = sysUpTime as seconds (because sysUpTime was reset)

     where, Delta Time = elapsed clock time since the last successful sysUpTime poll
3. NPS calculates node availability using the following formula:

   Node Availability = Available Seconds / Delta Time
4. If the node does not respond to polling during the polling interval, NPS creates a metric entry indicating an unresponsive target. The Node Availability value is set to NULL.

Calculating Node Reachability

NPS calculates node reachability as follows:

1. NNMi performs ICMP polls of the node's management address and passes the polling result to NPS.
2. NPS calculates node reachability using the following formula:
   - Reachable Seconds = Delta Time = Polling Interval

     The formula is applied only when the node is reachable (when the node's management address responds to the ICMP ping during any polling interval).

   - Delta Time = Polling Interval

     When Reachable Seconds = 0.

     Reachable seconds are considered as zero, when the node is not reachable (when the node's management address does not respond to the ICMP ping during the polling interval).
3. NPS calculates node reachability using the following formula:

   Node Reachability = Reachable Seconds / Delta Time

Glossary of Metrics

Term	Definition
Memory Utilization	Percentage of memory in use compared to the total amount of memory available.
Buffer Utilization	Percentage of buffer space in use compared to the total amount of buffer space available.
Buffer Miss Rate	A counter measures the number of buffers available in the buffer pool. An exception is recorded when the number of buffers drops below a minimum number. The miss rate percentage shows how the number of below-minimum samples compares to total samples.
Buffer Failure Rate	A counter measures the number of times buffer creation fails due to insufficient memory. An exception occurs when the number of failures crosses a threshold. The buffer failure rate is a percentage that shows how the number of buffer creation failures compares to the total number of buffer creations.
CPU Utilization	Percentage of CPU utilization in use compared to the total amount of CPU capacity available. (This metric maps to the CPU 1m utilization value from NNMi.)
CPU 5-Second Utilization	Average CPU utilization over a 5-second period, providing a snapshot of the past 5-seconds at the time of polling. Available from Cisco devices only.
CPU 1-Minute Utilization	Average CPU utilization over a 1-minute period, providing a snapshot of the previous minute at the time of polling. Available from Cisco and Nortel Passport devices.
CPU 5-Minute Utilization	Average CPU utilization over a 5-minute period, providing a snapshot of the previous 5 minutes at the time of polling. Available from Cisco devices only.
Response Time	The time it takes a node to respond to an SNMP request from NNMi
SampleCount	Number of samples. Some nodes do not support the full range of metrics. To avoid skewing the averages, separate counts are kept for each metric received.
NodeCount	Number of nodes polled.
ComponentCount	Number of components polled.

Glossary of Backplane Utilization Metrics

Backplane utilization indicates how much traffic is flowing through the switches available in a network.

Metric Name	Description
Backplane Utilization (avg)	Average rate of network traffic flowing through the components available in the network
Backplane Utilization (min)	Minimum rate of traffic flowing through the components available in the network
Backplane Utilization (max)	Maximum rate of traffic flowing through the components available in the network
Backplane Utilization - Threshold Exception Count (sum)	Total number of times the backplane utilization for the switches available in the network crossed the threshold level. Indicates that the data being transmitted over a switch's backplane is excessive.
Backplane Utilization - Threshold Exception Rate (avg)	Rate of the backplane utilization exceptions for the switches available in the network

Glossary of Disk Space Utilization Metrics

Metric Name	Description
Disk Space Utilization - Threshold Exception Count (sum)	Total number of times the disk space utilization has crossed the threshold level
Disk Space Utilization - Threshold Exception Rate (avg)	Rate of disk space utilization exceptions for the available hosts in a network
Disk Space Total - MB (avg)	Average amount of disk space allocated by all the selected hosts
Disk Space Total - MB (min)	Minimum amount of disk space allocated by all the selected hosts
Disk Space Total - MB (max)	Maximum amount of disk space allocated by all the selected hosts
Disk Space Used - MB (avg)	Average amount of host disk space used by the selected components
Disk Space Used - MB (min)	Minimum amount of host disk space used by the selected components
Disk Space Used - MB (max)	Maximum amount of host disk space used by the selected components
Disk Space Free - MB (avg)	Average amount of free host disk space available for the selected components
Disk Space Free - MB (min)	Minimum amount of free host disk space available for the selected components

Glossary of Node Availability Metrics

Metric Name	Description
Node Availability • Average • Maximum • Minimum	Amount of time the node was available for polling. Node availability depends on the sysUpTime of the node. See Calculating node availability.
Node Reachability • Average • Maximum • Minimum	Amount of time the node's management address was available to the ICMP polls performed by NNMi. See Calculating node reachability.
.ICMP ResponseTime (Milliseconds) • Average • Maximum • Minimum • Baseline Average • Average Baseline Deviation • Average Slope • Maximum Upper Normal Value • Minimum Lower Normal Value • Minimum Days to Threshold • Average Forecast Baseline (for four weeks) • Average Forecast Baseline (for eight weeks) • Maximum Forecast Upper Normal value (for 12 weeks) • Minimum Forecast Lower Normal value (for 12 weeks) • Sum of Baseline Exception Count • Average Baseline Exception Rate • Average Baseline Intercept Component • Average Baseline Trend Component • Average Baseline Seasonal Component	ICMP response time as milliseconds. If NNMi poll does not receive any responses from the node's management address, NPS considers this value to be NULL.

Metric Name	Description
• Maximum value for Anomaly Sample Flags Window • Average Baseline Linear Samples Used • Average Baseline Seasonal Samples Used • Maximum value for the Upper Threshold • Minimum value for the Lower Threshold • Sum of Threshold Exception Count • Average Threshold Exception Rate	

Glossary of Polling Metrics

Metric Name	Description
Target Error (avg)	Generated when the target component returns any of the following SNMP error responses: • Authentication error • No such name • No such object.
Reboot (avg)	Generated when the target component was restarted during the poll and no data could be retrieved from the component. NNMi checks the sysUptime metric to determine whether the component was restarted during the last poll.
Invalid Data (avg)	Generated when NNMi has successfully polled data from the target, but has determined that the data is invalid. For example, this metric is calculated when the number of packets is greater than the number of octets.
Unresponsive Target (avg)	Generated when the SNMP agent did not respond when collecting metrics for a particular polling policy.

About Frame Relay Health Reports

Frame Relay Health reports provide performance data for the Frame Relay virtual circuits in your environment.

These reports can let you see when a virtual circuit is being over-used or needs an upgrade.

You can open reports from NNMi or from the NPS home page.

You can also open a workspace view from NNMi, move to the iSPI, and begin your investigation from the NPS home page.

To open a report from the NNMi console:

1. Log in to the NNMi Console.
2. Select a workspace.
3. Open a view (nodes, interfaces, components, or incidents).
4. Select **Actions** > **HP NNM iSPI Performance** > **Reporting - Report Menu**.

Frame Relay Calendar Report

The Calendar report uses a traditional, calendar-style layout to show hourly statistics for two metrics in a single, extended graph spanning multiple days.

Defaults are:

- FrameRelay Pvc Name = All
- Dates/Times = Last 31 days
- Metric(s) Shown on Y1 Axis (Primary Metric) = Volume Bytes (sum)
- Metric(s) Shown on Y2 Axis (Secondary Metric) = CIR Utilization (avg)

The default view shows data for the current month. Depending on how long the iSPI has been collecting data from NNMi, you could have the option of looking at data for the previous 70 days if you use the option Until Now.

If you set the Time Range to less than 24 hours, the following message appears:

```
This report is not designed to operate with a time range of less than
24 hours. Please modify your time selections.
```

Use Case

This report enables you to:

- Observe gradual trends over time and isolated spikes
- Verify that an abnormal condition has returned to normal
- Make comparisons

This report also reveals day of week and hour of day patterns.

For example, if utilization is spiking on Tuesdays, or if response time issues are occurring daily at 11:00 a.m., the report will highlight these events.

Frame Relay Chart Detail Report

The Chart Detail report enables you to perform a trend analysis for network health and performance based on historical virtual circuit health data. It displays a comparative analysis of the selected metrics for each time unit.

For example, to compare how the volume of frames received and sent was affected by variance in the frame discards per millisecond for the past week, you would generate the Weekly Frame Relay report for the selected node group.

You can select two or more nodes, node groups, virtual circuits, or interface types.

The report enables you to:

- Analyze the trend of network health and performance for multiple nodes, node groups, virtual circuits, or virtual circuit groups based on one unit of time. Each unit of time is called a Display Grain. Each Display Grain is measured as follows:
  - 5 minutes for the hourly report
  - 1 hour for the daily report
  - 1 day for the weekly report
  - 1 day for the monthly report
- Identify the virtual circuit that is causing ups and downs in network health and performance.
- Detect any persistent problem in the virtual circuit health and performance.
- Compare the network health and performance of more than two nodes, node groups, virtual circuits, or virtual circuit groups based on historical virtual circuit health data.

The following filters are available in the Time Controls pane:

- Start Date/Time
- Time Range
- Display Grain
- Hour of day
- Day of Week

The graph on this report tracks up to six metrics per axis over the selected time period. The defaults are:

- FrameRelay Pvc Name = All
- Metric(s) Shown on Y1 Axis = Volume Bytes (sum)
- Metric(s) Shown on Y2 Axis = CIR Utilization (avg)

The Chart Detail report displays the selected metrics using the following Y axes:

- The left Y axis (the Y1 axis) displays the performance of the main metric on which you want to generate the report.
- The right Y axis (the Y2 axis) displays the performance of the metric that should overlay the main (primary) metric.

To add another metric, click **Options** and the  **Add New Grouping** button.

To remove a metric that you already added, click **Options** and the  **Remove Grouping** button.

The Chart Detail report enables you to view the data in tabular format. To view the table, click **Options** and select Table. The table appears instead of the chart. To view both the chart and the table, click **Options** and select Chart and Table.

Frame Relay Dashboard Report

The Dashboard report provides an overview of the interfaces available on your network using a combination of gauges, heat charts, and ordered Top 5 lists. The report displays the threshold

violations for volume, error, and availability. Threshold violations can point to a network-related problem or indicate that your thresholds within NNMi need to be changed.

To group the data within the dashboard:

1. Click **Options**.
2. In the Grouping By: field, select a topology filter to group the dashboard data.

   For example, if you use a grouping option of Node Name, all Availability exceptions that fall within the time and topology constraints are grouped by Node Name and displayed as a percentage of the total samples in the left gauge.

Dashboard Sections

- Gauge

  Gauges provide the following exception count statistics:

  - Availability Exceptions (% samples)
  - Utilization Exceptions (% samples)
  - Discard Rate Exceptions (% samples)
  - Error Rate Exceptions (% samples)

  When the NPS database has no data, the needle icons on the gauges on the Dashboard report do not appear.

- Top 5 Lists

  These lists display nodes responsible for the exceptions that show up in the gauges:

  - Top 5 Qualified Interface Names by Utilization Exceptions
  - Top 5 Qualified Interface Names by Availability Exceptions

- Top 5 Qualified Interface Names by Discard Exceptions Heat Chart

  You can:

  - Analyze the pattern of discard exceptions for the past 1 hour.
  - Compare the discard performance of different interfaces.
  - Detect the time range in the past 1 hour when the discard rates were the highest.

Example

If the gauges are showing few or no exceptions, none of your interfaces, including the interfaces in the Top 5 lists, are experiencing problems with utilization or availability.

Say that your network is divided into groups that represent regions or strategic locations for your enterprise. With the grouping option set to Node Group name, the report lists each of your strategic Node Groups (as defined within NNMi) and provides the current statistics for exceptions within each group.

If an unexpected change in exception counts is noted, you can click the appropriate gauge needle or Node Group within the Top 5 lists and launch another report (such as Chart Detail) to investigate trends or changes within the network as they are occur.

The thresholds that create exceptions are set from NNMi, not from the iSPI. To set or modify thresholds, refer to the online help for NNMi administrators.

Frame Relay Executive Report

The Executive report provides a broad view of interface performance for the selected time range with the following graphs:

- Volume of data passed through the interface (in GB)
- Average percentage of interface availability
- Average and maximum interface utilization percentage
- Threshold and baseline utilization exception rates
- Volume of data aggregated based on:
  - Volume of data passed through the node groups
  - Volume of data passed for each hour of the for the selected time range
- Average percentage of interface utilization for the node groups for the selected time range
- Average number of threshold and baseline exceptions faced by the node groups for the selected time range

You can:

- View every aspect of interface utilization and performance at once.
- View trends and verify that interface utilization and performance are meeting expectations.
- Identify isolated aberration in the graphs and detect any unexpected utilization or performance trend.
- View the trend of utilization for the node groups for the selected time range

The Executive report does not provide options to create graphs based on other metrics.

The default display grain for the Executive report is 1 hour.

This report shows the data for exceptions only if thresholds for performance metrics are set in NNMi.

Frame Relay Headline Report

The Headline report provides a broad view of interface performance for the past day with the following graphs:

- Volume of data passed through the interface (in MB)
- Average percentage of interface availability
- Average and maximum interface utilization percentage
- Threshold and baseline utilization exception rates
- Maximum throughput per second (in bps)
- Total number of data packets transmitted or received using unknown protocol
- Maximum percentage of discard rate

- Total number of discard rate exceptions
- Maximum percentage of error rate
- Total number of error rate exceptions

You can:

- View every aspect of interface utilization and performance at once.
- View trends and verify that interface utilization and performance are meeting expectations.
- Identify isolated aberration in the graphs and detect any unexpected utilization or performance trend.

The Headline report does not provide options to create graphs based on other metrics.

This report shows the data for exceptions only if thresholds for performance metrics are set in NNMi.

Frame Relay Headline-Wireless LAN Report

Available only on WLAN interfaces–following IEEE802dot11 performance policy

The Headline-Wireless LAN report provides a performance overview of the wireless LAN interfaces available in your network. It displays interface availability and performance for the past 24 hours with the following graphs:

- Total number of fragmented packets the interfaces have transmitted (sent and received) successfully
- Total number of successful RTS compared to the total number of failed RTS
- Average and maximum number of wireless clients using the interface
- Maximum number of active bridges and repeaters available in the network for past 24 hours
- Total number of wireless stations available in the network. The graph displays the total number of associated, authenticated, roamed in and roamed away stations available in the network.
- Total number of ACK failures that occurred in the wireless LAN for past 24 hours
- Total number of duplicate frames transmitted by the wireless LAN
- Total number of maxed out transmission attempts made by the wireless LAN
- Total number of undecryptable frames received by the wireless LAN in the past 24 hours
- Total number of FCS errors that occurred in the wireless LAN for the past 24 hours

You can:

- View every aspect of wireless LAN interface utilization and performance.
- View trends and verify that utilization and performance of the wireless LAN interfaces are meeting expectations.
- Identify isolated aberrations in the graphs and detect any unexpected utilization or performance trends.

The Headline-Wireless LAN report does not provide options to create graphs based on other metrics.

This report shows data for exceptions only if thresholds for performance metrics are set in NNMi.

Frame Relay Heat Chart Report

The Heat Chart report tracks the hourly performance of a single metric. The default metric is Volume-Bytes (sum). The default time period is the last 31 days. Performance is color-coded, which makes it easy to see if performance was satisfactory or unsatisfactory.

Features and Defaults

The legend at the top of the report maps a range of normalized performance values to a particular color.

Beneath the legend, a table represents the normalized values of a performance metric. Rows of the table represent hours of the day. Columns of the table represent days.

Each cell inside the table is color-coded. Each cell inside the table indicates a specific value of the metric. You can hover the mouse pointer on the cell to see the absolute metric value of each hour.

The default topology filters are:

- FrameRelay Pvc Name = All
- Time Period = Last 31 days
- Hour of Day = All
- Day of Week = All
- Metric = Volume - Bytes (sum)

Time range options are any period that is not less than 24 hours.

How to Use This Report

You can use this report to identify gradual shifts from one range of performance to another range, spot an isolated instance of poor performance that affected the results for past 24 hours, spot day-of-week patterns, and verify that an abnormal condition returned to normal after a problem was corrected.

Frame Relay Managed Inventory Report

The Managed Inventory report enables you to view the number of instances of each topology attribute seen in the collected data within the selected time range. For example, if the report is run for "Last 1 Hour," you would see the number of unique values for each attribute seen in the data collected over the past hour. The report can be useful for checking the number of nodes polled over any given time range.

You can use attributes to filter the data and create a report that represents the elements you are interested in. The report presents the list of attributes in the form of a table. The Count column indicates the number of entries for each attribute. For example, count 5 for the topology item Node Location means all nodes on your network can be grouped according to five different locations that host the nodes.

You can use the following topology attributes with the virtual circuit Health reports:

- Qualified FrameRelay Name
- FrameRelay Pvc Name

- FrameRelay Pvc DLCI
- FrameRelay Pvc ID
- Qualified Interface Name
- Interface Name
- Interface Alias
- Interface Physical Address
- Interface Annotation
- FrameRelay Pvc ID
- FrameRelay Pvc UUID
- Node Name
- Node Contact
- Node Location
- Node Family
- Node Vendor
- Node ID
- Node UUID
- Node Annotation
- Interface ODBID
- Node ODBID
- Tenant Name
- Tenant UUID
- SecGroup Name
- SecGroup UUID)

The Managed Inventory report can take a significant time to build if you select a time range greater than 24 hours.

Frame Relay Most Changed Report

The Most Changed report compares the performance of components for two different (consecutive) time periods and ranks the components by the amount of change. The sort order is most-changed to least-changed.

The report contains one table, which provides data for one metric only.

The table columns are:

- Grouping by levels; one to five columns, each displaying a level
- Performance for the previous time period
- Performance for the current time period

- Growth, expressed as a percentage increase
- Change

The default filters are:

- Grouping by Elements = Qualified FrameRelay Name
- Start Date/Time = depends on default Time Range and data available in database
- Hour of Day (HOD) = All
- Day of Week (DOW) = All
- Ranking Metric = Volume - Bytes (sum)
- Top N Option = Top 10

You can select multiple grouping attributes with the  **Add New Grouping** button. To remove a grouping attribute, use the  **Remove Grouping** button.

How to Use This Report

Use this report to spot objects at a grouping level that saw significant growth from the previous selected time period to the selected time period. Significant growth could point to a developing problem you need to know about. You can change the ranking metric and how many elements are listed.

Frame Relay Overview Report

The Overview report displays the utilization and performance of the most commonly monitored metrics in the Frame Relay extension pack.

You can:

- Monitor the daily utilization and performance of a set of pre-defined metrics.
- Identify the virtual circuits with unusual performance or utilization and drill down to other reports to analyze the problem.
- Rank the virtual circuits based on their utilization levels.
- Identify the metrics that are close to the threshold. Use the following sections to identify such virtual circuits:
  - 12 Weeks CIR In Utilization Forecasts
  - 12 Weeks CIR Out Utilization Forecasts

The default display grain for this report is 1 hour. To select a different time grain or time range, use the Time Controls tab in the navigation panel.

You cannot select the metrics for this report.

Frame Relay Peak Period Report

The Peak Period report ranks the utilization and performance of an interface during the busiest time of the selected time range.

You can:

- Identify the performance and utilization of the selected metrics during the peak period.
- Identify the interfaces that have the highest or lowest performances or utilization levels during the peak period.
- Compare the performance for multiple interfaces during the peak period using this report.

Use this report to:

- Identify a group of virtual circuits having a common network performance problem.
- Identify the virtual circuit that is suffering from a persistent performance problem.

Frame Relay Peak Period Report Options

- Top/Bottom N
- Select Metric(s)
- Grouping by Time Period

This report tracks up to six metrics over the selected time period.

To add another metric, click **Options** and the  **Add New Grouping** button.

To remove a metric you already added, click **Options** and the  **Remove Grouping** button.

To select a range of values for the metric, click  and  , and type a range of metric values the report should consider.

When specifying the range for a percentage metric, make sure that the ranges are in one of the following formats:

- Decimal multiplier (for example, 1 to specify 100%, 0.5 to specify 50%, etc.)
- Range with the % (Percentage) symbol (for example, 100%, 50%, etc.)

For example, to see the top five virtual circuits for node 15.2.103.112 with average utilization between 10% and 90%, type the following ranges:

- 0.1 or 10% as **Lowest Value**
- 0.9 or 90% as the **Highest Value**

By default, the report groups data by Qualified FrameRelay Name. You can select multiple grouping attributes with the  button. To remove a grouping attribute, use the  button.

Frame Relay Threshold Sleeve Report

The Threshold Sleeve report analyzes how close the metric performance value is to the threshold levels. It enables you to analyze when the metric will reach the threshold.

You can:

- Forecast over-utilization or under-utilization of the selected Frame Relay virtual circuit.
- Detect if the metric performance is about to cross the high and low thresholds.

For example, if you generate the Threshold Sleeve Chart report for Availability (avg), the chart displays the how close the average virtual circuit availability is to the high and low threshold.

- Save multiple Threshold Sleeve Reports for a specific metric for different time ranges, and analyze the metric performance trend.

This report supports one metric.

Frame Relay Top N Report

The Top N report ranks network elements by the metric you select. Use this report to spot the element that performed at the extremes and to analyze historical data for elements that exhibit unusual utilization levels.

You can:

- Detect the Frame Relay virtual circuits that have a health or performance problem.
- Analyze the utilization of the NNMi managed Frame Relay virtual circuits based on a specified time range.
- Detect over-utilized and under-utilized Frame Relay virtual circuits in the network.
- Compare the performance of multiple Frame Relay virtual circuits for a single node or multiple nodes using this report.

For example, say that one of the routers in your network is performing poorly. You could group the Frame Relay virtual circuit for the router reporting the highest average error rate. The virtual circuit reporting the highest average error rate is ranked first.

Interface Health Top N Reports Options

The Top N report displays the following options:

- Top / Bottom N
- Select Metric(s): The report ranks the selected virtual circuits based on the value of the first metric listed in the Select Metric(s) field.
- Display Time Series Chart
- Grouping By

This report tracks up to six metrics for each metric type over the selected time period.

To add another metric, click **Options** and the **Add New Grouping** button.

To remove a metric you already added, click **Options** and the **Remove Grouping** button.

To select a range of values for the metric, click the button and , and select a range of metric values the report should consider. Make sure that the range is in one of the following formats:

- Decimal multiplier (for example, 1 to specify 100%, 0.5 to specify 50%, etc.)
- Range with the % (Percentage) symbol (for example, 100%, 50%, etc.)

For example, to see the top five interfaces for node 15.2.103.112 with average utilization between 10% and 90%, type the following ranges:

- 0.1 or 10% as **Lowest Value**
- 0.9 or 90% as the **Highest Value**

By default, the report groups data by Qualified FrameRelay Name. You can select multiple grouping attributes with the  button. To remove a grouping attribute, use the  button.

The Time Series Chart report displays the selected metrics using two Y axes:

- The left Y axis (the Y1 axis) displays the performance of the main metric on which you want to generate the report.
- The right Y axis (the Y2 axis) displays the performance of the metric that should overlay the main (primary) metric.

By default, Top N Report does not display the Time Series Chart. To view the chart with the detail table:

- Select **Options** > **Display Time Series Chart** > **Confirm Selection**.
- Click tje **Show Chart** link below the detail table.

Check this report once a day to see which network interface might need special attention.

Check this report periodically throughout the day to see which network interfaces are performing at the extremes and might need special attention.

Frame Relay Top N Chart Report

The Top N Chart report ranks the Frame Relay virtual circuits by the metric you select.

This report enables you to:

- Spot the virtual circuits that performed at the extremes.
- Analyze the historical data for virtual circuits that are exhibiting unusual utilization levels.
- Detect the virtual circuits having a health or performance problem.
- Analyze the utilization of the NNMi managed Frame Relay virtual circuits based on a specific time range.
- Detect the over-utilized and under-utilized Frame Relay virtual circuits in the network.
- Detect the underlying reason of a persistent problem with a virtual circuit. You can compare the performance for multiple virtual circuits using this report.

Top N Chart Options

- Top / Bottom N
- Select Metric(s)
- Grouping By

This report tracks up to six metrics over the selected time period.

To add another metric, click **Options** and the  **Add New Grouping** button.

To remove a metric you already added, click **Options** and the  **Remove Grouping** button.

To select a range of values for the metric, click  and  , and select a range of metric values the report should consider.

When specifying the range for a percentage metric, use one of the following formats:

- Decimal multiplier (for example, 1 to specify 100%, 0.5 to specify 50%, etc)
- Range with the % (Percentage) symbol (for example, 100%, 50%, etc)

For example, to see the top five Frame Relay virtual circuits for node 15.2.103.112 with average utilization between 10% and 90%, type the following ranges:

- 0.1 or 10% as **Lowest Value**
- 0.9 or 90% as the **Highest Value**

By default, the report groups data by Qualified FrameRelay Name. You can select multiple grouping attributes with the  button. To remove a grouping attribute, use the  button.

The Top N Chart report displays the selected metrics using the following Y axes:

- The left Y axis (the Y1 axis) displays the performance of the main metric on which you want to generate the report.
- The right Y axis (the Y2 axis) displays the performance of the metric that should overlay the main (primary) metric.

Check this report once a day to see which interface might need special attention.

Check this report periodically throughout the day to see which interfaces are performing at the extremes and might need special attention.

Frame Relay Top N CSV Report

The Top N CSV report retrieves a huge amount of data from the NPS database for the selected time range, which could result in performance problems.

You can, however, schedule the following reports in CSV format:

- The Top N CSV report ranks the selected topology element according to the utilization level of the selected metric in descending order.
- The Top N Detail CSV report lists metric utilization for the selected topology element according to the selected time grain.

  This report ranks the elements based on total metric utilization for the selected time range and breaks up the metric utilization value for each time grain. For example, say you selected the Time Range: Last 24 Hours option. The default display grain for this time range is 1 hour.

- Topology Element: FrameRelay Pvc Name

  Metric: Volume–Bytes (sum) and CIR Utilization (avg)

  This report ranks the FrameRelay Pvc Names based on the metric Volume–Bytes (sum). The FrameRelay Pvc Name with the highest volume of data passing through it receives the highest rank. The Top N Detail CSV report then calculates and lists the volume of data passed through this element every hour in the past 24 hours.

Glossary of Frame Relay Health Metrics

Available only for Frame Relay interfaces.

Metric	Description
Discards - Frames (sum)	Total number of inbound frames dropped due to any of the following reasons: • Format errors • Inactive Virtual Circuit (VC)
BECN In - Frames (sum)	Total number of frames received from the network indicating backward congestion since the VC was created. Backward congestion occurs in the following circumstances: • When the remote DTE sets the **BECN** flag to 1. • When a switch in the network receives the frame from a trunk with congested transmission queue.
FECN In - Frames (sum)	Total number of frames received from the network indicating forward congestion since the VC was created. Forward congestion occurs in the following circumstances: • When the remote DTE sets the **FECN** flag to 1. • When a switch in the network enqueues the frame to a trunk with congested transmission queue.
FECN Frames In Rate • avg • min • max	Rate of frames received from the network indicating forward congestion as compared to the total number of frames received over the selected VC Calculated using the following formula: `100.00 * (Sum of frames indicating forward congestion / Sum of frames received)`
BECN Frames In Rate • avg • min • max	Rate of frames received from the network indicating backward congestion as compared to the total number of frames received over the selected VC Calculated using the following formula: `100.00 * (Sum of frames indicating backward congestion / Sum of frames received)`
FECNPlusBECN Frames In Rate • avg • min • max	Rate of frames received from the network indicating congestion (backward or forward) as compared to the total number of frames received over the selected VC Calculated using the following formula:

	`100.00 * (Sum of frames indicating backward congestion + Sum of frames indicating forward congestion) / Sum of frames received`
DE Frames In Rate • avg • min • max	Rate of frames received from network that were eligible for discard as compared to the total number of frames received over the selected VC `100.00 * (Sum of frames marked as eligible for discard / Sum of frames received)`
DE Frames Out Rate • avg • min • max	Rate of frames sent to the network that were eligible for discard as compared to the total number of frames sent over the selected VC `100.00 * (Sum of frames marked as eligible for discard / Number of frames sent)`
Volume - Bytes (sum)	Total number of octets received and sent over the selected VC for the time range that you selected.
Volume - Bytes In (sum)	Total number of octets received over the selected VC for the time range that you selected.
Volume - Bytes Out (sum)	Total number of octets sent over the selected VC for the time range that you selected.
Volume - Frames (sum)	Total number of frames received and sent over the selected VC for the time range that you selected
Volume - Frames In (sum)	Total number of frames received over the selected VC for the time range that you selected.
Volume - Frames Out (sum)	Total number of frames sent over the selected VC for the time range that you selected.
Volume - DE Frames (sum)	Total number of frames sent and received from the network that were eligible for discard for the selected VC for the time range you selected.
Volume - DE Frames In (sum)	Total number of frames received from the network that were eligible for discard for the selected VC for the time range you selected.
Volume - DE Frames Out (sum)	Total number of frames sent to the network that were eligible for discard for the selected VC for the time range you selected.
Volume - NonDE Frames (sum)	Total number of frames sent and received from the network that were **not** eligible for discard for the selected VC for the time range you selected. Calculated using the following formula: `(Sum of frames sent from the selected VC + Sum of frames received on the selected VC) - (Sum of DE frames sent from the selected VC + Sum of DE frames received on the selected VC)`

Volume - NonDE Frames In (sum)	Total number of frames received from the network that were **not** eligible for discard for the selected VC for the time range you selected. Calculated using the following formula: `(Sum of frames received on the selected VC) - (Sum of DE frames received on the selected VC)`
Volume - NonDE Frames Out (sum)	Total number of frames sent to the network that were **not** eligible for discard for the VC for the selected time range Calculated using the following formula: `(Sum of frames sent from the selected VC) - (Sum of DE frames sent from the selected VC)`
Frames Size - Bytes • avg • min • max	Sum of octets in total number of frames sent and received over the VC for the selected time range
Frames Size - Bytes In • avg • min • max	Sum of octets in total number of frames received over the VC for the selected time range
Frames Size - Bytes Out • avg • min • max	Sum of octets in total number of frames sent over the VC for the selected time range
CIR Utilization • avg • min • max	Amount of data (in bits) that the selected VC agrees to transmit under normal conditions.

CIR In Utilization • avg • min • max	Amount of data (in bits) that the selected VC receives under normal conditions. Calculated using the following formula: `(Number of octets received * 8 * 100)/(CIR * sysUpTimeDelta in seconds)` sysUpTimeDelta = number of seconds since the node was restarted
CIR Out Utilization • avg • min • max	Amount of data (in bits) that the selected VC sends under normal conditions. Calculated using the following formula: `(Number of octets sent * 8 * 100)/(CIR * sysUpTimeDelta> in seconds)` sysUpTimeDelta = number of seconds since the node was restarted
EIR Utilization • avg • min • max	Amount of uncommitted data bits that the selected VC attempts to transmit over the selected time period.
EIR In Utilization • avg • min • max	Amount of uncommitted data bits that the selected VC receives over the selected time period.
EIR Out Utilization • avg • min • max	Amount of uncommitted data bits that the selected VC sends over the selected time period.
Availability	The state of the VC, as reported to NPS. The state can be either active or not active.
SNMP Response Time (msecs)	The time it takes the VC to respond to an SNMP request from NNMi
Period Length (secs)	The duration (in seconds) between consecutive polling cycles of NNMi.

Unresponsive Target	Generated when the SNMP agent did not respond when collecting metrics for a particular polling policy.
Target Error	Generated if the target VC returns any of the following SNMP error responses: • Authentication error • No such name • No such object
Reboot	Generated if the target VC was restarted during the poll and no data could be retrieved from the component.
Invalid Data	Generated when NNMi has successfully polled data from the target, but has determined that the data is invalid. For example, this metric is calculated when the number of packets is greater than the number of octets.

About Reportlets

In a large enterprise network, the NNM iSPI Performance products (HP NNM iSPI Performance for Metrics, HP NNM iSPI Performance for Quality Assurance, and HP NNM iSPI Performance for Traffic) can produce a large amount of data and large cardinality. Enterprise networks often have a very large number of unique IP addresses, source nodes, destination nodes, virtual circuits, interfaces, and components that each produce a large amount of data. Generating reports can therefore be time-consuming.

Reportlets enable you to generate quick impressions of the larger reports using the NNM iSPI Performance dashboard.

To display the reportlets:

1. Log on to the NPS home page.
2. On the left navigation panel, select **Dashboard Reportlets**.
3. Select an extension pack and a reportlet.

You can also create custom dashboards using the reportlets.

Simple Bar Chart

This reportlet compares the performance of two metrics for the selected time range.

It enables you to:

- Compare the performance trends of multiple metrics.
- Analyze how the value of the secondary metric increases or decreases based on the increase or decrease in the value of the primary metric.

This reportlet supports two metrics.

To select a new metric for your reportlet, see Change Reportlet Options in the *Using Reports* > *Change Default Settings* section.

Simple Bar and Line Chart

Displays the trend of performance of the Frame Relay virtual circuits for past 24 hours using the following values:

- Primary Metric on the bar chart
- Secondary Metric on the line chart

Enables you to:

- Compare the performance trends of multiple metrics.
- Analyze how the value of the secondary metric increases or decreases based on the increase or decrease in the value of the primary metric.

This reportlet supports two metrics.

To select a new metric for your reportlet, see Change Reportlet Options in the *Using Reports* > *Change Default Settings* section.

Calendar

Displays a comparative study of the selected Primary Metric and Secondary Metric

The default display grain is set to one hour. You cannot change the display grain of this reportlet.

Enables you to monitor the following:

- Daily CIR or EIR utilization for the selected Frame Relay virtual circuits
- Volume of data passed through the virtual circuit for past 24 hours
- Performance of the virtual circuit for past 24 hours

This reportlet supports two metrics.

To select a new metric for your reportlet, see Change Reportlet Options in the *Using Reports* > *Change Default Settings* section.

Gauge

This reportlet evaluates the metric for a selected point in time.

Select only the metrics that display the percentage values.

It enables you to:

- Measure the daily performance of the selected metric.
- Detect any abnormal or unexpected performance level.

The reportlet supports one metric.

When the NPS database has no data, the needle icon on the gauge does not appear.

To select a new metric for your reportlet, see Change Reportlet Options in the *Using Reports* > *Change Default Settings* section.

Heat Chart

This reportlet grades the performance of the selected metric for the selected time range.

The metric performance is aggregated according to an hourly display grain.

It enables you to:

- View how the performance of the selected Frame Relay virtual circuits are affected by a varying metric.
- Compare the hourly performance of the selected metric.
- Detect the time range when the performance of the selected Frame Relay virtual circuits were affected adversely because of the fluctuating metric value.

This reportlet supports one metric.

To select a new metric for your reportlet, see Change Reportlet Options in the *Using Reports* > *Change Default Settings* section.

Metric Snapshot

This reportlet displays the metric performance for the selected time range.

It enables you to:

- Build a performance history for a selected metric and analyze how its performance changes over time. This history can help you decide the baseline value for the metric.
- Compare the performance of multiple metrics over a specified time range. You can generate a snapshot report for a single metric, and you can save the snapshot report for various metrics and compare the performance of each metric over a time range.

This reportlet supports one metric.

To select a new metric for your reportlet, see Change Reportlet Options in the *Using Reports* > *Change Default Settings* section.

Most Changed

This reportlet compares the metric performance of the selected time range with the period that preceded the time range.

It aggregates metric utilization and ranks performance in descending order.

It enables you to:

- Measure the performance fluctuations for the Frame Relay virtual circuits.
- Detect the top N Frame Relay virtual circuits that have a common performance or utilization problem.

You can enhance the usability of the reportlet through the following features:

- Top/Bottom N
- Grouping By

The reportlet supports one metric.

To select a new metric for your reportlet, see Change Reportlet Option in the *Using Reports* > *Change Default Settings* section.

Multimetric Chart

This reportlet analyzes the performance trend for the selected metrics for the selected time range.

It enables you to:

- Perform a comparative analysis of the selected metrics for each display grain. The default display grain is one hour.
- Analyze the reason for ups and downs in the performance of the selected Frame Relay virtual circuits.
- Detect any persistent problem in the performance of the Frame Relay virtual circuits.

The reportlet supports up to six metrics.

To select a new metric for your reportlet, see Change Reportlet Options in the *Using Reports* > *Change Default Settings* section.

Simple Chart

This reportlet analyzes the utilization trend for the selected metrics for the selected time range.

It enables you to:

- Perform comparative analysis of the selected metrics for each display grain. The default display grain is one hour.
- Analyze the reason for ups and downs in the performance of the selected Frame Relay virtual circuits.
- Detect any persistent problem in the performance of the selected Frame Relay virtual circuits

The reportlet supports two metrics.

To select a new metric for your reportlet, see Change Reportlet Options in the *Using Reports* > *Change Default Settings* section.

Simple Table

This reportlet analyzes the utilization trend for the selected metrics for the selected time range. The default display grain is one hour.

It enables you to:

- Analyze the hourly performance of the metrics.
- Detect any abnormal or unexpected performance for the selected Frame Relay virtual circuits.
- Analyze how the value of the secondary metric increases or decreases based on the increase or decrease in the value of the primary metric.

The reportlet supports up to six metrics.

To select a new metric for your reportlet, see Change Reportlet Options in the *Using Reports* > *Change Default Settings* section.

Sparkline

This reportlet evaluates how the selected metric value changed during the selected time range.

It enables you to:

- Analyze variations in performance for the selected metric.
- Decide whether the expected behavior for the selected metric should be reassessed.

The reportlet supports one metric.

To select a new metric for your reportlet, see Change Reportlet Options in the *Using Reports* > *Change Default Settings* section.

Threshold Sleeve Chart

This reportlet analyzes how close the metric performance value is to the threshold levels.

It enables you to:

- Detect if the metric performance is about to cross the high and low thresholds.

  For example, if you generate the Exception Sleeve Chart reportlet for CIR Utilization (avg), the chart displays how many exceptions are raised on average CIR utilization in the past 24 hours,
- Save multiple Sleeve Reports for a time range, and for analyze the trend of performance for the metric.

The reportlet supports one metric.

To select a new metric for your reportlet, see Change Reportlet Options in the *Using Reports* > *Change Default Settings* section.

Top N Chart

This reportlet ranks the individual contribution of each metric for the performance for the selected Frame Relay virtual circuits for the selected time range.

The performance of the interface is aggregated on an hourly basis.

It enables you to:

- Spot the virtual circuits for which the performance metrics present extreme values.
- Investigate the aggregated data for the virtual circuits that are exhibiting unusual utilization levels.
- Select the metric on which to generate the report. The metric you select is used to rank the virtual circuits.
- Group the report data based on a specific parameter. To add a subgroup, click the  **Add New Grouping** button.

The reportlet supports one metric.

To select a new metric for your reportlet, see Change Reportlet Options in the *Using Reports* > *Change Default Settings* section.

Top N Line Chart

This reportlet ranks the utilization trend for the selected metrics for the selected time range.

The performance of the virtual circuits is aggregated on an hourly basis.

It enables you to:

- Spot the virtual circuits for which the performance metrics present extreme values.
- Investigate the aggregated data for the virtual circuits that are exhibiting unusual utilization levels.
- Select the metric on which to generate the report. The metric you select is used to rank the virtual circuits.
- Group the report data based on a specific parameter. To add a subgroup, click the  **Add New Grouping** button.

The reportlet supports one metric.

To select a new metric for your reportlet, see Change Reportlet Options in the *Using Reports* > *Change Default Settings* section.

Top N Stacked Chart

This reportlet ranks the individual contribution of each virtual circuit based on the selected metrics.

The performance of each interface is aggregated for the default display grain of 1 hour.

It enables you to:

- Spot the virtual circuits for which the performance metrics present extreme values.
- Investigate the aggregated data for the virtual circuits that are exhibiting unusual utilization levels.
- Detect network paths that have a common network performance problem.

The reportlet supports up to six metrics.

To select a new metric for your reportlet, see Change Reportlet Options in the *Using Reports* > *Change Default Settings* section.

Top N Table

This reportlet ranks the interfaces based on the selected metric.

It enables you to:

- Spot the virtual circuits for which the performance metrics present extreme values.
- Investigate the aggregated data for the virtual circuits that are exhibiting unusual utilization levels.
- Select the metric on which to generate the report. The metric you select is used to rank the virtual circuits.

- Group the report data based on a specific parameter. To add a subgroup, click the **Add New Grouping** button.

The reportlet supports up to six metrics.

To select a new metric for your reportlet, see Change Reportlet Options in the *Using Reports* > *Change Default Settings* section.

Top N Table with Bars

This reportlet ranks the Frame Relay virtual circuits based on the selected metric and displays a horizontal bar to depict the aggregated metric value.

It enables you to:

- Spot the virtual circuits for which the performance metrics present extreme values.
- Investigate the aggregated data for the virtual circuits that are exhibiting unusual utilization levels.
- Select the metric on which to generate the report. The metric you select is used to rank the virtual circuits.
- Group the report data based on a specific parameter. To add a subgroup, click the **Add New Grouping** button.

The reportlet supports up to six metrics.

To select a new metric for your reportlet, see Change Reportlet Options in the *Using Reports* > *Change Default Settings* section.

About Interface Health Reports

Interface Health reports provide performance data for network interfaces. Graphs and charts provide details that help you identify:

- Interface utilization
- Errors in interfaces
- Interface discard rate
- Availability of interfaces

You can use these reports to determine the status of the interfaces on your network.

To open a report from the NNMi console:

You have the following options.

- Move from NNMi to the iSPI, and launch reports from the Report Menu.

  Or

- Launch pre-filtered reports directly from NNMi.

If you are interested in a particular node, node group, or interface, you will probably want to launch a pre-filtered report from NNMi. Otherwise, open a workspace view from NNM, move to the iSPI, and begin your investigation from the Report menu.

To move from NNM to the iSPI:

1. Log in to the NNMi console.
2. Select a workspace.
3. Open a view of nodes, interfaces, or incidents.
4. Select **Actions** > **HP NNM iSPI Performance** > **Reporting - Report Menu**

Interface Health Baseline Sleeve Report

The Baseline Sleeve report analyzes how close the metric performance value is to the threshold levels. In other words, this report enables you to analyze when the metric will reach the threshold.

Using this report, you can:

- Analyze if the interface utilization or performance is within the expected (normal) range for the selected time range.
- Detect if the metric performance is about to cross the high and low thresholds.

  For example, if you generate the Baseline Sleeve Chart report for the baseline metric Utilization In, the chart displays the how close the interface utilization for incoming flow is to the high and low threshold.
- Save multiple Baseline Sleeve Reports for a specific metric for different time ranges, and analyze the metric performance trend.

Interface Health Calendar Report

The Calendar report uses a traditional, calendar-style layout to show hourly statistics for two metrics in a single, extended graph spanning over multiple days.

Features and Defaults

The report defaults to:

- Interfaces = All
- Dates/Times = Last 31 days
- Metric(s) Shown on Y1 Axis (Primary Metric) = Volume Bytes (sum)
- Metric(s) Shown on Y2 Axis (Secondary Metric) = Utilization (avg)

The default view shows data for the current month. Depending on how long the iSPI has been collecting data from NNMi, you could have the option of looking at data for the previous 70 days if you use the Until Now option.

If you set the Time Range to less than 24 hours, the following message appears:

```
This report is not designed to operate with a time range of less than
24 hours. Please modify your time selections.
```

How to Use this Report

You can use this report to:

- Observe gradual trends over time and isolated spikes
- Verify that an abnormal condition has returned to normal
- Make comparisons

This report also reveals:

- Day of week patterns
- Hour of day patterns

For example, if utilization is spiking on Tuesdays, or if response time issues are occurring daily at 11:00 a.m., the report will highlight these events.

Interface Health Chart Detail Report

The Chart Detail report enables you to perform a trend analysis for the network health and performance based on historical interface health data.

The report displays a comparative analysis of the selected metrics for each time unit.

For example, if you need to compare how the average Threshold Exception Rate was affected by variance in the average Response Time per millisecond for the past one week, you can generate the Weekly Interface Health report for the selected node group.

You can also select two or more nodes, node groups, interfaces, or interface groups to generate the report.

This report enables you to:

- Analyze the trend of network health and performance for multiple nodes, node groups, interfaces, or interface groups based on one unit of time. Each unit of time is called as a Display Grain. Each Display Grain is measured as follows:
  - 5 minutes for Hourly report
  - 1 hour for daily report
  - One day for weekly report
  - One day for monthly report
- Identify the interface that is causing any ups and downs in network health and performance.
- Detect any persistent problem in the interface health and performance.
- Compare the network health and performance of more than two nodes, node groups, interfaces, or interface groups based on historical interface health data.

The following filters are available in the Time Controls pane:

- Start Date/Time
- Time Range
- Display Grain
- Hour of day
- Day of Week

Features and Defaults

The graph on this report tracks up to six metrics per axis over the selected time period. Unless you modify the defaults, Chart Detail defaults to the following:

- Interfaces = All
- Metric(s) Shown on Y1 Axis = Volume Bytes (sum)
- Metric(s) Shown on Y2 Axis = Availability - Utilization (avg)

The Chart Detail report displays the selected metrics using two Y axes.

- The left Y axis (the Y1 axis) displays the performance of the main metric on which you want to generate the report.
- The right Y axis (the Y2 axis) displays the performance of the metric that should overlay the main (primary) metric.

To add another metric, click **Options** and the  **Add new grouping** button.

To remove a metric that you already added, click **Options** and the  **Remove Grouping** button.

The Chart Detail report enables you to view the data in tabular format. To view the table, click **Options** and select Table. The Table appears instead of the chart. To view both the chart and the table, click **Options** and select Chart and Table.

Interface Health Dashboard Report

The Dashboard report provides an overview of the interfaces available on your network using a combination of gauges, heat charts, and ordered Top 5 lists. It displays the threshold violations for volume, error, and availability. Threshold violations can point to a network-related problem or indicate that your thresholds within NNMi need to be changed.

To group the data within the dashboard:

1. Click **Options**.
2. In the Grouping By: field, select a topology filter to group the dashboard data.

   For example, say you use a grouping option of Node Name. All Availability exceptions that fall within the time and topology constraints would be grouped by Node Name and displayed as a percentage of the total samples in the left gauge.

Dashboard Sections

- **Gauges** provide the following exception count statistics:
  - Availability Exceptions (% samples)
  - Utilization Exceptions (% samples)
  - Discard Rate Exceptions (% samples)
  - Error Rate Exceptions (% samples)

  When the NPS database has no data, the needle icons on the gauges on the Dashboard report do not appear.
- **Top 5 Lists** display nodes responsible for the exceptions showing up in the gauges:
  - Top 5 Qualified Interface Names by Utilization Exceptions
  - Top 5 Qualified Interface Names by Availability Exceptions

- **Top 5 Qualified Interface Names by Discard Exceptions Heat Chart** enables you to:
  - Analyze the pattern of discard exceptions for the past 1 hour.
  - Compare the discard performance of different interfaces.
  - Detect the time range in the past 1 hour when the discard rates were the highest.

Example

If the gauges show few or no exceptions, this means that none of your interfaces, including the interfaces in the Top 5 lists, are experiencing problems with utilization or availability.

For example, your network is divided into groups that represent regions or strategic locations for your enterprise. With the grouping option set to Node Group name, the report lists each of your strategic Node Groups (as defined within NNMi) and provides the current statistics for exceptions within each group.

If an unexpected change in exception counts is noted, you can click the appropriate gauge needle or Node Group within the Top 5 lists, and then launch another report (such as Chart Detail) to investigate trends or changes within the network as they are occurring.

The thresholds that create exceptions are set from NNMi, not from the iSPI. If you want to set or modify thresholds, refer to the online help for NNMi administrators.

Interface Health Executive Report

The Executive report provides a broad view of interface performance for the selected time range, using the following graphs:

- Volume of data passed through the interface (in GB)
- Average percentage of interface availability
- Average and maximum interface utilization percentage
- Threshold and baseline utilization exception rates
- Volume of data aggregated based on the following:
  - Volume of data passed through the node groups
  - Volume of data passed for each hour of the for the selected time range
- Average percentage of interface utilization for the node groups for the selected time range
- Average number of threshold and baseline exception faced by the node groups for the selected time range

This report enables you to:

- View every aspect of interface utilization and performance at once.
- View trends and verify that interface utilization and performance are meeting expectations.
- Identify isolated aberration in the graphs and detect any unexpected utilization or performance trend.
- View the trend of utilization for the node groups for the selected time range

The Executive report does not provide options to create graphs based on other metrics.

The default display grain for the Executive report is one hour.

This report shows the data for exceptions only if thresholds for performance metrics are set in NNMi.

Interface Health Headline Report

The Headline report provides a broad view of interface performance for the past one day, using the following graphs:

- Volume of data passed through the interface (in MB)
- Average percentage of interface availability
- Average and maximum interface utilization percentage
- Threshold and baseline utilization exception rates
- Maximum throughput per second (in bps)
- Total number of data packets transmitted or received using unknown protocol
- Maximum percentage of discard rate
- Total number of discard rate exceptions
- Maximum percentage of error rate
- Total number of error rate exceptions

This report enables you to:

- View every aspect of interface utilization and performance at once.
- View trends and verify that interface utilization and performance are meeting expectations.
- Identify isolated aberration in the graphs and detect any unexpected utilization or performance trend.

The Headline report does not provide options to create graphs based on other metrics.

This report shows the data for exceptions only if thresholds for performance metrics are set in NNMi.

Interface Health Headline-Wireless LAN Report

Available only on WLAN interfaces – Following IEEE802dot11 performance policy

The Headline-Wireless LAN report provides a performance overview of the wireless LAN interfaces available in your network. It displays interface availability and performance for the past 24 hours using the following graphs:

- Total number of fragmented packets the interfaces have transmitted (sent and received) successfully
- Total number of successful **RTS** compared to the total number of failed RTS
- Average and maximum number of wireless clients using the interface
- Maximum number of active bridges and repeaters available in the network for the past 24 hours
- Total number of wireless stations available in the network. The graph displays total number of associated, authenticated, roamed in and roamed away stations available in the network.
- Total number of **ACK** failures occurring in the wireless LAN in the past 24 hours

- Total number of duplicate frames transmitted by the wireless LAN
- Total number of maxed out transmission attempts made by wireless LAN
- Total number of undecryptable frames received by wireless LAN in the past 24 hours
- Total number of **FCS** errors occurring in the wireless LAN in the past 24 hours

This report enables you to:

- View every aspect of the wireless LAN interface utilization and performance at once.
- View trends and verify that the utilization and performances of the wireless LAN interfaces are meeting expectations.
- Identify isolated aberration in the graphs and detect any unexpected utilization or performance trend.

The Headline-Wireless LAN report does not provide options to create graphs based on other metrics.

This report shows the data for exceptions only if thresholds for performance metrics are set in NNMi.

Interface Health Heat Chart Report

The Heat Chart report tracks the hourly performance of a single metric. The default metric is Volume-Bytes (sum). The default time period is the past 31 days. Performance is color-coded, making it easy to see whether performance has been satisfactory or unsatisfactory.

Features and Defaults

The legend at the top of the report maps a range of normalized performance values to a particular color.

Beneath the legend, a table represents the normalized values of a performance metric (rows of the table represent hours of the day; columns of the table represent days).

Each cell inside the table is color-coded and each cell inside the table indicates a specific value of the metric. You can also hover the mouse pointer on the cell to see the absolute metric value of each hour.

The default topology filters for the Heat Chart are as follows:

- Interfaces = All
- Time Period = Last 31 days
- Hour of Day = All
- Day of Week = All
- Metric = Volume - Bytes (sum)

Time range options are any period that is not less than 24 hours.

How to Use this Report

You can identify gradual shifts from one range of performance to another range, to spot an isolated instance of poor performance that affected the results for past 24 hours, to spot day-of-week patterns, and to verify that an abnormal condition returned to normal after a problem was corrected.

Interface Health Managed Inventory Report

The Managed Inventory report enables you to view the number of instances of each topology attribute seen in the collected data within the selected time range. For example, if the report is run for Last 1 Hour, you would see the number of unique values for each attribute seen in the data collected over the last hour. This report can be useful for checking, for example, the number of nodes polled over any given time range.

You can use the available attributes to filter the data of your interest and create a report that represents only the elements of your interest. The report presents the list of attributes in the form of a table. The Count column of the table indicates the number of entries for each attribute. For example, count 5 for the topology item Node Location means that all nodes on your network can be grouped based on five different locations that host the nodes.

You can use the following topology attributes with the Interface Health reports:

- Qualified Interface Name
- Interface Name
- Interface Alias
- Interface Descr
- Interface Index
- Interface Type
- Interface Physical Address
- Interface Speed (In:Out)
- Interface ID
- Interface UUID
- Interface Annotation
- Node Name
- Node Contact
- Node Location
- Node Family
- Node Vendor
- Node ID
- Node UUID
- Node Annotation
- Interface ODBID
- Node ODBID
- Tenant Name
- Tenant UUID

- SecGroup Name
- SecGroup UUID)

Interface Health Most Changed Report

The Most Changed report compares performance the components for two different (consecutive) time periods and ranks components by the amount of change. The sort order is most-changed to least-changed.

Features and Defaults

This report contains one table. The table provides data for one metric only.

The table columns are:

- Grouping by levels; one to five columns, each displaying a level
- Performance for the previous time period
- Performance for the current time period
- Growth, expressed as a percentage increase
- Change

The default filters for the Most Changed report defaults to:

- Grouping by Elements = Qualified Interface Name
- Start Date/Time = depends on default Time Range and data available in database
- Hour of Day (HOD) = All
- Day of Week (DOW) = All
- Ranking Metric = Volume - Bytes (sum)
- Top N Option = Top 10

You can select multiple grouping attributes with the **Add New Grouping** button. You can remove a grouping attribute with the **Remove Grouping** button.

How to Use this Report

Use this report to spot objects at selected grouping level that saw significant growth from the previous selected time period to the selected time period. Significant growth could point to a developing problem you need to know about. You can change the ranking metric and you can change how many elements are listed.

Interface Health Overview Report

The Overview report displays the utilization and performance of the most commonly monitored metrics in the Interface Health extension pack.

You can:

- Monitor the daily utilization and performance of a set of pre-defined metrics.
- Identify the interfaces with unusual performance or utilization and drill down to other reports to analyze the problem.
- Rank the interfaces based on their utilization levels.
- Identify the metrics that are close to the threshold. Use the following sections to identify such interfaces:
  - 12 Weeks Utilization In Forecasts
  - 12 Weeks Utilization Out Forecasts

The default display grain for this report is one hour. To select a different time grain or time range, use the Time Controls tab in the navigation panel.

You cannot select the metrics for this report.

Interface Health Peak Period Report

The Peak Period report ranks the utilization and performance of an interface during the busiest time of the selected time range.

You can:

- Identify the performance and utilization of the selected metrics during the peak period.
- Identify the interfaces that have the highest or lowest performances or utilization levels during the peak period.
- Compare the performance for multiple interfaces during the peak period using this report.

How to Use this Report

Use this report to:

- Identify a group of interfaces having a common network performance problem.
- Identify the interface that is suffering from a persistent performance problem.

Interface Health Peak Period Report Options

- Top / Bottom N
- Metric
- Grouping by Time Period

This report tracks up to six metrics over the selected time period.

To add another metric, click **Options** and the **Add New Grouping** button.

To remove a metric that you have already added, click **Options** and the **Remove Grouping** button.

To select a range of value for the metric, click and , and type a range of metric value that the report should consider. Make sure that the ranges are any of the following formats:

- Decimal multiplier (for example, 1 to specify 100%, 0.5 to specify 50%, etc)
- Range with the % (Percentage) symbol (for example, 100%, 50%, etc)

For example if you want to see the top five interfaces for the node 15.2.103.112 with the average utilization between 10% and 90% type the following ranges:

- 0.1 or 10% as **Lowest Value**
- 0.9 or 90% as the **Highest Value**

By default, the report groups data by Qualified Interface Name. You can select multiple grouping attributes by using the  (**Add New Grouping**) button. Use the  (**Remove Grouping**) button to remove a grouping attribute.

Tips:

- Use this report to identify the period when the interface utilization was the highest.
- Check this report once a day to see which interface may need special attention.
- Check this report periodically throughout the day to see which interface is performing at the extremes and may need special attention.

Interface Health Threshold Sleeve Report

The Threshold Sleeve report analyzes how close the metric performance value is to the threshold levels. In other words, this report enables you to analyze when the metric will reach the threshold.

Using this report, you can:

- Forecast over-utilization or under-utilization of the selected interface.
- Detect if the metric performance is about to cross the high and low thresholds.

  For example, if you generate the Threshold Sleeve Chart report for Availability (avg), the chart displays the how close the average interface availability is to the high and low threshold.
- Save multiple Threshold Sleeve Reports for a specific metric for different time ranges, and analyze the metric performance trend.

This report supports one metric.

Interface Health Top N Report

The Top N report ranks network elements by the metrics you select. The report enables you to:

- Detect any network interface that is having a health or performance problem.
- Analyze the utilization of the NNMi-managed network interfaces for a specific time range.
- Detect over-utilized and under-utilized network interfaces in the network.
- Compare the performance of multiple network interfaces for a single node or multiple nodes.

For example, say that one of the routers in your network is performing poorly. With this report, you can group the router interfaces that report the highest average error rate. The interface reporting the highest average error rate is ranked first.

How to Run the Top N Report

Selecting the Top N report in the Reports pane automatically runs the report. The values selected the previous time the report was run are used. You can change the values with the Options menu and customize the report. The following report options are available:

- Top / Bottom 'N'
- Select Metric(s):
- Display Time Series Chart
- Grouping by:

Report Options

Top / Bottom 'N'

You can select from the following:

Ranking Number	Description
Top 5	
Top 10	
Top 25	
Top 50	
Top 100	
Bottom 5	
Bottom 10	
Bottom 25	
Bottom 100	
Sort All in Descending	
Sort All in Ascending	

Select Metric(s)

You can select up to six metrics for each metric type over the selected time period. To add a metric, click  Add new grouping. To remove a metric, click  Remove metric.

To select a range of values for the metric, click  and  Apply Filter, and select a range of metric values the report should consider. Make sure that the ranges are in one of the following formats:

- Decimal multiplier (for example, 1 to specify 100%, 0.5 to specify 50%, etc.)
- Range with the % (Percentage) symbol (for example, 100%, 50%, etc.)

For example, to see the top five interfaces for node 15.2.103.112, where the average utilization is between 10% and 90%, type the following ranges:

- 0.1 or 10% as **Lowest Value**
- 0.9 or 90% as the **Highest Value**

By default, the report groups data by Qualified Interface Name.

The selected interfaces are ranked according to the value of the first metric listed in the Select Metric(s) field. You can select any of the metrics listed in the two drop-down boxes. The metrics you select are displayed along the two Y axes of the resulting chart.

- The selections you make in the left box appear along the left (Y1) axis of the resulting chart.
- The selections you make in the right box appear along the right (Y2) axis.

A number of metrics provide aggregated (avg, max, min, and percentile) values. Percentiles have the following meaning:

- (pctile05) - 5 percent of samples fall below, and 95 percent fall above.
- (pctile90) - 90 percent of samples fall below, and 10 percent fall above.
- (pctile95) - 95 percent of samples fall below, and 5 percent fall above.
- (pctile99) - 99 percent of samples fall below, and 1 percent fall above.

For a full list of the available metrics, see "List of Metrics".

Display Time Series Chart

Selecting Yes produces a chart that displays the selected metrics along two Y axes.

- The left (Y1) axis displays the performance of the main metric on which you want to generate the report.
- The right (Y2) axis displays the performance of the metric that should overlay the main (primary) metric.

Grouping by:

This option enables you to select a Grouping Attribute. The selections are the following.

Grouping Attribute	Description
Interface Group Name	
NodeGroup Name	
MPLS L3VPN Name	
MPLS VRF Name	
Qualified Interface Name	
Interface Name	
Interface Alias	
Interface Descr	
Interface Type	
Interface Physical Address	
Interface Speed	

Grouping Attribute	Description
(In:Out)	
Interface UUID	
Interface ODBID	
Node Name	
Node Short Name	
Node Contact	
Node Location	
Node Family	
Node Vendor	
Node UUID	
Node ODBID	
Tenant Name	
Tenant UUID	
SecGroup Name	
SecGroup UUID	
Node Annotation	
Interface Annotation	

You can add another grouping by clicking  .

When your report completes, you can save it as a Report View. To save it, click the **Keep this version** drop-down list and select **Save as Report View**. The Save as report view window opens. You can specify a name and location. When done, click **OK**.

Tips:

- Check this report once a day to see which network interface might need special attention.
- Check this report periodically throughout the day to see which network interfaces are performing at the extremes and might need special attention.

Interface Health Top N Chart Report

The Top N Chart report ranks the interfaces by the metric you select.

You can:

- Spot the interface that performed at the extremes.
- Analyze the historical data for interfaces that are exhibiting unusual utilization levels.

- Detect the interface having a health or performance problem.
- Analyze the utilization of the NNMi managed interfaces based on a specific time range.
- Detect the over-utilized and under-utilized interfaces in the network.
- Detect the underlying reason of a persistent problem with a interface. You can compare the performance for multiple interfaces using this report.

Top N Chart Options

The Top N Chart displays the following options:

- **Top / Bottom N**
- **Metric**
- **Grouping By**

The report tracks up to six metrics over the selected time period.

To add another metric, click **Options** and the  **Add New Grouping** button.

To remove a metric that you already added, click **Options** and the  **Remove Grouping** button.

To select a range of value for the metric, click  and , and select a range of metric value the report should consider. Make sure that the ranges are in one of the following formats:

- Decimal multiplier (for example, 1 to specify 100%, 0.5 to specify 50%, etc.)
- Range with the % (Percentage) symbol (for example, 100%, 50%, etc.)

For example, to see the top five interfaces for node 15.2.103.112, with average utilization between 10% and 90%, type the following ranges:

- 0.1 or 10% as **Lowest Value**
- 0.9 or 90% as the **Highest Value**

By default, the report groups data by Qualified Interface Name. You can select multiple grouping attributes with the  (**Add New Grouping**) button. To remove a grouping attribute, use the  (**Remove Grouping**) button.

The Top N Chart report displays the selected metrics using two Y axes.

- The left Y axis (the Y1 axis) displays the performance of the main metric based on the report you want to generate.
- The right Y axis (the Y2 axis) displays the performance of the metric that should overlay the main (primary) metric.

Tips:

- Check this report once a day to see which interface might need special attention.
- Check this report periodically throughout the day to see which interfaces are performing at the extremes and might need special attention.

About Reportlets

In a large enterprise network, the NNM iSPI Performance products (HP NNM iSPI Performance for Metrics, HP NNM iSPI Performance for Quality Assurance, and HP NNM iSPI Performance for Traffic) can produce a large amount of data and large cardinality. Enterprise networks often have a very large number of unique IP addresses, source nodes, destination nodes, virtual circuits, interfaces, and components that each produce a large amount of data. Generating reports can therefore be time-consuming.

Reportlets enable you to generate quick impressions of the larger reports using the NNM iSPI Performance dashboard.

To display the reportlets:

1. Log in to the NPS home page.
2. On the left navigation panel, select **Dashboard Reportlets**.
3. Select an extension pack and a reportlet.

You can also create custom dashboards using the reportlets.

Baseline Metric Snapshot with Range

Displays the aggregated metric performance for the selected time range.

Enables you to:

- Build a performance history for the selected baseline metric and analyze how the metric performance changes over time.

  Such history may help you to select an expected performance level for the metric

- Compare the performance for multiple metrics over a specified time range.

  Though you can generate snapshot report for a single metric, you can save the snapshot report for various metrics and compare the performance of each metric over a time range.

This reportlet supports one metric.

To select a new metric for your reportlet, click **Show Toolbar** and **Options**.

Baseline Sleeve Chart

Analyzes how close the metric performance value is to the threshold levels.

Enables you to:

- Detect if the metric performance is about to cross the high and low thresholds.

  For example, if you generate the Baseline Sleeve Chart reportlet for Utilization (avg), the chart displays how many exceptions are raised on average utilization in the past 24 hours,

- Save multiple Sleeve Reports for a time range, and for analyze the trend of performance for the metric.

This reportlet supports one metric.

To select a new metric for your reportlet, click **Show Toolbar** and **Options**.

Baseline Sparkline

Evaluates the trend of how the selected baseline metric value has changed for the selected time range.

Enables you to:

- Analyze the variations in the performance for the selected metric.
- Decide whether the expected behavior for the selected metric should be reassessed.

This reportlet supports one metric.

To select a new metric for your reportlet, click **Show Toolbar** and **Options**.

Baseline Sparkline with Range

Evaluates the trend of how the selected baseline metric value has changed for the selected time range.

Enables you to:

- Evaluate the performance trend of the selected metric for the selected time range.
- Compare the present performance trend with the normal (expected) performance range.
- Measure the performance of past 24 hours in percentage.

This reportlet supports one metric.

To select a new metric for your reportlet, click **Show Toolbar** and **Options**.

Calendar

Displays a comparative study of the selected **Primary Metric** and **Secondary Metric**

The default display grain is set to one hour. You cannot change the display grain of this reportlet.

Enables you to monitor the following:

- Daily interface utilization
- Volume of data passed through the interface for past 24 hours
- Performance of the interface for past 24 hours

This reportlet supports two metrics.

To select a new metric for your reportlet, click **Show Toolbar** and **Options**.

Gauge

Evaluates the metric for the selected point of time.

Select only the metrics that displays the percentage values.

Enables you to:

- Measure the daily performance of the selected metric.
- Detect any abnormal or unexpected performance level.

This reportlet supports one metric.

When the NPS database has no data, the needle icon on the gauge does not appear.

To select a new metric for your reportlet, click **Show Toolbar** and **Options**.

Heat Chart

Grades the performance of the selected metric for the selected time range.

The metric performance is aggregated based on an hourly display grain.

Enables you to:

- View how the interface performance gets affected by a varying metric.
- Compare the hourly performance of the selected metric.
- Detect the time range when the interface performance was affected adversely because of the fluctuating metric value.

This reportlet supports one metric.

To select a new metric for your reportlet, click **Show Toolbar** and **Options**.

Metric Snapshot

Displays the metric performance for the selected time range.

Enables you to:

- Build a performance history for the selected metric and analyze how the metric performance changes over time.

  Such history may help you to decide the baseline value for the metric
- Compare the performance for multiple metrics over a specified time range.

  Though you can generate snapshot report for a single metric, you can save the snapshot report for various metrics and compare the performance of each metric over a time range.

This reportlet supports one metric.

To select a new metric for your reportlet, click **Show Toolbar** and **Options**.

Most Changed

Compares the metric performance between the following:

- Selected time range
- Period preceding the selected time range

Aggregates the metric utilization and ranks the performance in a descending order.

Enables you to:

- Measure the performance fluctuations for the interfaces.
- Detect the top N interfaces having a common performance or utilization problem.

You can enhance the reportlet usability using the following features:

- **Top / Bottom N**
- **Grouping By**

This reportlet supports one metric.

To select a new metric for your reportlet, click **Show Toolbar** and **Options**.

Multimetric Chart

Analyzes the performance trend for the selected metrics for the selected time range.

Enables you to:

- Perform comparative analysis of the selected metrics for each display grain.

  The default display grain is one hour.
- Analyze the reason for any ups and downs in the interface performance.
- Detect any persistent problem in the interface performance.

This reportlet supports up to six metrics.

To select a new metric for your reportlet, click **Show Toolbar** and **Options**.

Simple Bar and Line Chart

Displays the trend of interface performance for past 24 hours using the following values:

- **Primary Metric** on the bar chart
- **Secondary Metric** on the line chart

Enables you to:

- Compare the performance trends of multiple metrics.
- Analyze how the value of the secondary metric increases or decreases based on the increase or decrease in the value of the primary metric.

This reportlet supports two metrics.

To select a new metric for your reportlet, click **Show Toolbar** and **Options**.

Simple Bar Chart

Compares the performance of two metrics for the selected time range.

Enables you to:

- Compare the performance trends of multiple metrics.
- Analyze how the value of the secondary metric increases or decreases based on the increase or decrease in the value of the primary metric.

This reportlet supports two metrics.

To select a new metric for your reportlet, click **Show Toolbar** and **Options**.

Simple Chart

Analyzes the utilization trend for the selected metrics for the selected time range.

Enables you to:

- Perform comparative analysis of the selected metrics for each display grain.

  The default display grain is one hour.
- Analyze the reason for any ups and downs in the interface performance.
- Detect any persistent problem in the interface performance.

This reportlet supports two metrics.

To select a new metric for your reportlet, click **Show Toolbar** and **Options**.

Simple Table

Analyzes the utilization trend for the selected metrics for the selected time range.

The default display grain is one hour.

Enables you to:

- Analyze the hourly performance of the metrics.
- Detect any abnormal or unexpected interface performance.
- Analyze how the value of the secondary metric increases or decreases based on the increase or decrease in the value of the primary metric.

This reportlet supports up to six metrics.

To select a new metric for your reportlet, click **Show Toolbar** and **Options**.

Sparkline

Evaluates the trend of how the selected metric value has changed for the selected time range.

Enables you to:

- Analyze the variations in the performance for the selected metric.
- Decide whether the expected behavior for the selected metric should be reassessed.

This reportlet supports one metric.

To select a new metric for your reportlet, click **Show Toolbar** and **Options**.

Threshold Sleeve Chart

Analyzes how close the metric performance value is to the threshold levels.

Enables you to:

- Detect if the metric performance is about to cross the high and low thresholds.

  For example, if you generate the Exception Sleeve Chart reportlet for Utilization (avg), the chart displays how many exceptions are raised on average utilization in the past 24 hours,

- Save multiple Sleeve Reports for a time range, and for analyze the trend of performance for the metric.

This reportlet supports one metric.

To select a new metric for your reportlet, click **Show Toolbar** and **Options**.

Top N Chart

Ranks the individual contribution of each metric for the interface performance for the selected time range.

The performance of the interface is aggregated on hourly basis.

Enables you to:

- Spot the interfaces for which the performance metrics present extreme values.
- Investigate the aggregated data for the interfaces that are exhibiting unusual utilization levels.
- Select the metric based on which you want to generate the report. The metric that you select is used to rank the interfaces.
- Group the report data based on a specific parameter. To add a subgroup, click the **Add New Grouping** button.

This reportlet supports one metric.

To select a new metric for your reportlet, click **Show Toolbar** and **Options**.

Top N Line Chart

Ranks the utilization trend for the selected metrics for the selected time range.

The performance of the interface is aggregated on hourly basis.

Enables you to:

- Spot the interfaces for which the performance metrics present extreme values.
- Investigate the aggregated data for the interfaces that are exhibiting unusual utilization levels.
- Select the metric based on which you want to generate the report. The metric that you select is used to rank the interfaces.
- Group the report data based on a specific parameter. Click **Add Group** to add a subgroup.

This reportlet supports one metric.

To select a new metric for your reportlet, click **Show Toolbar** and **Options**.

Top N Stacked Chart

Ranks the individual contribution of each interface based on the selected metrics.

The performance of each interface is aggregated for the default display grain of one hour.

Enables you to:

- Spot the interfaces for which the performance metrics present extreme values.
- Investigate the aggregated data for the interfaces that are exhibiting unusual utilization levels.
- Detect the network path having a com m on network performance problem.

This reportlet supports up to six metrics.

To select a new metric for your reportlet, click **Show Toolbar** and **Options**.

Top N Table

Ranks the interfaces based on the selected metric.

Enables you to:

- Spot the interfaces for which the performance metrics present extreme values.
- Investigate the aggregated data for the interfaces that are exhibiting unusual utilization levels.
- Select the metric based on which you want to generate the report. The metric that you select is used to rank the interfaces.
- Group the report data based on a specific parameter. Click **Add Group** to add a subgroup.

This reportlet supports up to six metrics.

To select a new metric for your reportlet, click **Show Toolbar** and **Options**.

Top N Table with Bars

Ranks the interfaces based on the selected metric and displays a horizontal bar to depict the aggregated metric value.

Enables you to:

- Spot the interfaces for which the performance metrics present extreme values.
- Investigate the aggregated data for the interfaces that are exhibiting unusual utilization levels.
- Select the metric based on which you want to generate the report. The metric you select is used to rank the interfaces.
- Group the report data based on a specific parameter. To add a subgroup, click the **Add New Grouping** button.

This reportlet supports up to six metrics.

To select a new metric for your reportlet, click **Show Toolbar** and **Options**.

Calculating Availability

AvailabilityPct (Avg%, Min%, Max%) represents the average availability of all samples. NNMi calucates this metric using multiple values including but not limited to **ifOperStatus** and **ifAdminStatus**.

Calculating Availability for Interfaces

Scenario 1

An interface is considered available, when:

- The agent is reachable and the following conditions are met:
  - HP NNM iSPI Performance for Metrics receives polled data from the agent.
  - The polled data confirms that the ifOperStatus and ifAdminStatus are up.
- The agent is not reachable; that is, the agent did not respond to the performance query but the following conditions are met:
  - HP NNM iSPI Performance for Metrics does not receive polled data from the agent.
  - The polled data confirms that `ifOperStatus` and `ifAdminStatus` are up.
  - NNMi has determined that the device SNMP agent is responding.

Scenario 2

An interface is considered unavailable when:

- The agent is reachable and the following conditions are met:
  - HP NNM iSPI Performance for Metrics receives polled data from the agent.
  - The polled data confirms that `ifOperStatus` is down.
  - The polled data confirms that `ifAdminStatus` is up.
- The agent is not reachable; that is the agent did not respond to the performance query and the following conditions are met:
  - HP NNM iSPI Performance for Metrics does not receive polled data from the agent.
  - NNMi has determined that the device SNMP agent is not responding.
- The agent is not reachable; that is, the agent did not respond to the performance query and the following conditions are met:
  - HP NNM iSPI Performance for Metrics does not receive polled data from the agent.
  - The polled data confirms that `ifOperStatus` is down.
  - The polled data confirms that `ifAdminStatus` is up.
  - NNMi has determined that the device SNMP agent is not responding.

Scenario 3

A sample is not considered for reporting, when:

- `ifAdminStatus` is down.
- You configure NNMi not to poll the interface for `ifAdminStatus` and `ifOperStatus`.
- You manually configure a device or an interface as Out of Service or Unmanaged.

Calculating AvailabilityPct

HP NNM iSPI Performance for Metrics calculates the number of seconds for the metric AvailabilityPct as equal to the polling interval if `ifOperStatus` for the interface is Up.

Availability percent for a given interface over a specific time range is calculated using the following formula:

100 * (Total Available Seconds / Total Polling Interval in Seconds)

If `ifOperStatus` for the interface is down, the number of seconds for the AvailabilityPct metric is considered as 0 (zero) for the sample.

Example

- If an interface is unavailable for 15 minutes and available for 45 minutes in an hour, the AvailabilityPct (avg) for that hour will be 75%.
- A node has two interfaces. Interface1 is available for the whole hour, and Interface2 is unavailable for the whole hour. The AvailabilityPct (avg) for the node would be 50% for that hour.

Availability Exceptions

Depicts the number of availability exceptions.

NNMi raises an availability exception for a sample when interface availability decreases below a preset threshold.

Availability Exception Aggregation Rule

- Availability Exceptions (sum): The total number of samples that are marked as exceptions. In other words, it depicts the number of samples where an interface was unavailable.
- Availability Exceptions (%Avg, %Max, %Min): The percentage of samples that are marked as exceptions. For example, if five samples out of 100 samples are marked as exceptions, Availability - Exception Rate (avg) will be 5%.

Glossary of Basic Metrics

Metric	Description
countDistinct Metrics	The countDistinct metrics are provided only by the Interface Health Extension Pack. They track the number of interfaces over a period of time. You can use a countDistinct metric on a report with a topology filter selection to track the number of interfaces that belong to the selected topology group. For example, if you select the Qualified Interface Name metric with the topology filter selection of a particular Interface Group, you can track the number of interfaces that belong to the selected group from the generated report. Some of the available countDistinct metrics are: • Qualified Interface Name • Interface Name • Interface Alias • Interface Descr • Interface Index • Interface Type • Interface Physical address • Interface Speed (In:Out) • Interface ID • Interface UUID • Node Name • Node Contact • Node Location • Node Family • Node Vendor • Node ID • Node UUID
Discard Exceptions • Discard Exceptions (sum) • Discard Exceptions (%samples)	Number of packet discard exceptions; percentage of samples above the discard exception threshold.
Discards - Packets	Total number of discarded packets, in and out combined,

Metric	Description
• Discards Packets (sum) • Discards Packets In (sum) • Discards Packets Out (sum)	followed by the number of discarded incoming packets and the number of discarded outbound packets.
Discard Rate • Discard Rate (avg, min, and max) • Discard Rate - Lower Threshold • Discard Rate - Threshold Exception Count • Discard Rate - Threshold Exception Rate • Discard Rate - Upper Threshold • Discard Rate In (avg, min, and max) • Discard Rate In - Lower Threshold • Discard Rate In - Threshold Exception Count • Discard Rate In - Discount Exception Rate • Discard Rate In - Upper Threshold • Discard Rate Out (avg, min, and max)	Total number of packets with discards as a percentage of total packets (minimum, maximum, and average); followed by the number of discarded packets incoming, as a percentage of total incoming packets (minimum, maximum, and average), and the number of discarded packets outbound, as a percentage of total outbound packets (minimum, maximum, and average).
Error Exceptions • Error Exceptions (#samples) • Error Exceptions (%samples)	Number of packet error exceptions; percentage of samples above the error exception threshold.
Error Rate • Error Rate (avg) • Error Rate (min) • Error Rate (max) • Error Rate - Lower Threshold • Error Rate - Threshold Exception Count	Total number of packets with errors as a percentage of total packets; followed by number of packets with errors received as a percentage of total packets received, and number of packets with errors transmitted, as a percentage of total packets transmitted.

Metric	Description
• Error Rate - Threshold Exception Rate • Error Rate - Upper Threshold • Error Rate In (avg) • Error Rate In (min) • Error Rate In (max) • Error Rate In - Lower Threshold • Error Rate In - Threshold Exception Count • Error Rate In - Threshold Exception Rate • Error Rate In - Upper Threshold • Error Rate Out (avg) • Error Rate Out (min) • Error Rate Out (max) • Error Rate Out - Lower Threshold • Error Rate Out - Threshold Exception Count • Error Rate Out - Threshold Exception Rate • Error Rate Out - Upper Threshold	
Errors • Errors - Packets (sum) • Errors - Packets In (sum) • Errors - Packets Out (sum)	Total number of packets with errors, in and out combined; number of incoming packets with errors; number of outbound packets with errors.
Period - Length (secs) (sum)	The duration (in seconds) between consecutive polling cycles of NNMi.
Sample Count	Number of polled samples
SNMP Response Time	SNMP Response Time (msec) (avg, min, max): time for interface/device to respond to polling request
Throughput (bps) • Throughput In (bps) • Throughput Out (bps)	• Total throughput on the interface (in bits-per-second): ▪ Throughput (bps) (avg) ▪ Throughput (bps) (min) ▪ Throughput (bps) (max)

Metric	Description

	• Incoming throughput on the interface (in bits-per-second):
	  ▪ Throughput In (bps) (avg)
	  ▪ Throughput In (bps) (min)
	  ▪ Throughput In (bps) (max)
	• Outgoing throughput on the interface (in bits-per-second):
	  ▪ Throughput Out (bps) (avg)
	  ▪ Throughput Out (bps) (min)
	  ▪ Throughput Out (bps) (max)

Utilization - avg% • Utilization (avg) • Utilization In (avg) • Utilization Out (avg)	Average utilization from any sample
Utilization - max% • Utilization (max) • Utilization In (max) • Utilization Out (max)	Maximum utilization in (the largest value from any sample); maximum utilization out (the largest value from any sample)
Utilization - min% • Utilization (min) • Utilization In (min) • Utilization Out (min)	Minimum utilization in (the smallest value from any sample); minimum utilization out (the smallest value from any sample)
Utilization Exceptions • Utilization Exceptions (sum) • Utilization Exceptions (%samples)	Number of exceptions; percentage of samples above or below the threshold range set in NNMi.
Volume • Volume - Packets (sum) • Volume - Packets In (sum) • Volume - Packets Out (sum) • Volume -Bytes (sum) • Volume - Bytes In (sum) • Volume - Bytes Out (sum)	Total number of data packets or bytes passing through the network

Metric Types

The Interface Health extension pack provides the following types of metrics.

Metric	Description
Gauge	Metrics with single non-cumulative values. For example: SNMP Response Time, Throughput (bps). The iSPI Performance for Metrics calculates the average, minimum, and maximum values while aggregating the values of gauge metrics.
Percent	Metrics with single non-cumulative percentage values. For example: Discards Rate, Error Rate. The iSPI Performance for Metrics calculates the average, minimum, and maximum values while aggregating the values of percent metrics.
Counter	Metrics that have incremental values. For example: Volume - Bytes, Volume - Packets. HP NNM iSPI Performance for Metrics calculates the sum while aggregating the values of counter metrics.
Exceptions	The count or percentage of samples that are out of the threshold boundary defined in NNMi. To use exception metrics, you must set the thresholds in NNMi by following the instructions in the "Configure Threshold Monitoring for Interfaces" section of the *HP Network Node Manager i Software Online Help for Administrators*. The Exception (sum) metrics indicate the count of samples that are outside of the threshold boundary (depends on the polling interval). The Exception (Avg%, Max%, Min%) metrics indicate the percentage of samples outside of the threshold boundary (independent of the polling interval).

Glossary of LAN Metrics

Available for the following:

- ETHERLIKE -MIB
- OLD-CISCO-INTERFACES-MIB

Metric	Description
LAN FCS Error Count • Sum • Average • Minimum • Maximum	Number of frames received on the selected interface that consist of the necessary number of octets in length but do not pass the FCS check. This count does not include the frames received with any of the following errors: • frame-too-long • frame-too-short

Metric	Description
• Baseline Average (avg) • Baseline Deviation (avg) • Slope (avg) • Upper Normal (max) • Lower Normal (min) • Days To Threshold (min) • Baseline Exception Count (sum) • Baseline Exception Rate (avg) • Baseline Intercept Component (avg) • Baseline Trend Component (avg) • Baseline Seasonal Component (avg) • Anomaly Sample Flags Window (sum) • Baseline Linear Samples Used (avg) • Baseline Seasonal Samples Used (avg) • Upper Threshold (max) • Lower Threshold (min) • Threshold Exception Count (sum) • Threshold Exception Rate (avg)	The count of LAN FCS error increases when the MAC service returns a frameCheckError to the LLC or another MAC user. NNMi enables you to define an upper and a lower thresholds for the count of FCS WLAN Errors. See the *NNMi Online Help for Administrators* for information about how to define thresholds using the Threshold Configuration form.
LAN Collision Count (sum)	Number of output collisions detected on the selected interface
LAN Collision Rate • Average • Minimum • Maximum	Percentage of output collisions detected on the selected interface for the selected time range Calculated using any of the following methods based on the interface type: • `((100.0 * collisonsOut Number of output collisions detected on the selected interface for the selected time range) / (ifHCOutUcastPkts Number of packets that higher-level protocols`

Metric	Description
	requested be transmitted, and which were not addressed to a multicast or broadcast address at the sub-layer for the selected interface. These include those packets that were discarded or not sent. + ifHCOutMulticastPkts Number of packets transmitted to a multicast address per second during the selected time range + ifHCOutBroadcastPkts Number of packets transmitted to a broadcast address per second during the selected time range) • ((100.0 * collisonsOut) / (ifOutUcastPkts Number of packets that higher-level protocols requested be transmitted, and which were not addressed to a multicast or broadcast address at the sub-layer for the selected interface. These include those packets that were discarded or not sent. + ifOutNUcastPkts Number of packets that higher-level protocols requested be transmitted to a non-unicast (i.e., a subnet roadcast or subnet multicast) address. These include the packets that were discarded or not sent.) • ((100.0 * collisonsOut) / (ifOutUcastPkts + ifOutMulticastPkts + ifOutBroadcastPkts)
LAN Deferred Frames (sum)	Total number of frames for which the first transmission attempt on the selected interface is delayed because the medium is busy The count does not include the following: • Frames involved in collisions • Interfaces that are operating in full-duplex mode • Frames delayed because of discontinuities in the management system
LAN Alignment Errors (sum)	Total number of input packets that had cyclic redundancy checksum errors
Input Queue Drops	Number of packets the selected interface dropped because the input queue was full

Metric	Description
• Sum • Baseline Average (avg) • Baseline Deviation (avg) • Baseline Slope (avg) • Upper Normal (max) • Lower Normal (min) • Days To Threshold (min) • Baseline Exception Count (sum) • Baseline Exception Rate (avg) • Baseline Intercept Component (avg) • Baseline Trend Component (avg) • Baseline Seasonal Component (avg) • Anomaly Sample Flags Window (sum) • Baseline Linear Samples Used (avg) • Baseline Seasonal Samples Used (avg) • Upper Threshold (max) • Lower Threshold (min) • Threshold Exception Count (sum) • Threshold Exception Rate (avg)	NNMi enables you to define an upper and a lower thresholds for the count of input queue drops. See the *NNMi Online Help for Administrators* for information about how to define thresholds using the Threshold Configuration form.
Output Queue Drops • Sum • Baseline Average (avg) • Baseline Deviation (avg) • Baseline Slope (avg) • Upper Normal (max) • Lower Normal (min) • Days To Threshold (min) • Baseline Exception Count (sum)	Number of packets the selected interface dropped because the output queue was full NNMi enables you to define an upper and a lower thresholds for the count of output queue drops. See the *NNMi Online Help for Administrators* for information about how to define thresholds using the Threshold Configuration form.

Metric	Description
• Baseline Exception Rate (avg) • Baseline Intercept Component (avg) • Baseline Trend Component (avg) • Baseline Seasonal Component (avg) • Anomaly Sample Flags Window (sum) • Baseline Linear Samples Used (avg) • Baseline Seasonal Samples Used (avg) • Upper Threshold (max) • Lower Threshold (min) • Threshold Exception Count (sum) • Threshold Exception Rate (avg)	

Note: The ETHERLIKE-MIB polling policies override the OLD-CISCO-INTERFACES-MIB polling policies, if the selected interface supports both ETHERLIKE-MIB and OLD-CISCO-INTERFACES-MIB, and thus both State Poller policies.

Glossary of Polling Metrics

Metric	Description
Target Error (avg)	Generated if the target interface returns any of the following SNMP error responses: • Authentication error • No such name • No such object.
Reboot (avg)	Generated if the target interface was restarted during the poll and no data could be retrieved from the interface. NNMi checks the sysUptime metric to determine whether the interface was restarted during the last poll.
Invalid Data (avg)	Generated when NNMi has successfully polled data from the target, but has determined that the data is invalid. For example, this metric is calculated when the number of packets is greater than the number of octets.
Unresponsive Target (avg)	Generated when the SNMP agent did not respond when collecting

	metrics for a particular polling policy.

Glossary of SDH DS1 Metrics

Available only for DS1 Interfaces

Metric	Description
DSx1SESs Rate • Average • Minimum • Maximum	Rate of Severely Errored Seconds encountered by the selected DS1 interface in one second. The object returns the total number of Severely Errored Seconds encountered by the interface in past 15 minutes. NPS calculates the rate of Severely Errored Seconds per second. NPS calculates the metric to display average, minimum, and maximum rate of Severely Errored Seconds encountered by the selected interface.
DSx1SEFSs Rate • Average • Minimum • Maximum	Rate of Severely Errored Framing Seconds encountered by the selected DS1 interface in one second. The object returns the total number of Severely Errored Framing Seconds encountered by the interface in past 15 minutes. NPS calculates the rate of Severely Errored Framing Seconds per second. NPS calculates the metric to display average, minimum, and maximum rate of Severely Errored Framing Seconds encountered by the selected interface.
DSx1ESs Rate • Average • Minimum • Maximum	Rate of Errored Seconds encountered by the selected DS1 interface in one second. The object returns the total number of Errored Seconds encountered by the interface in past 15 minutes. NPS calculates the rate of Errored Seconds per second. NPS calculates the metric to display average, minimum, and maximum rate of Errored Seconds encountered by the selected interface.
DSx1UASs Rate • Average • Minimum • Maximum	Rate of Unavailable Seconds encountered by the selected DS1 interface in one second. The object returns the total number of Errored Seconds encountered by the interface in past 15 minutes. NPS calculates the rate of Errored Seconds per second. NPS calculates the metric to display average, minimum, and maximum rate of Errored Seconds encountered by the selected interface.
DSx1PCVs/sec • Average	Rate of Path Coding Violations encountered by the selected DS1 interface in one second. The object returns the total number of Path Coding Violations encountered by the interface in past 15 minutes.

Metric	Description
• Minimum • Maximum	NPS calculates the rate of Path Coding Violations per second. NPS calculates the metric to display average, minimum, and maximum rate of Path Coding Violations encountered by the selected interface.
DSx1DMs Rate • Average • Minimum • Maximum	Rate of Degraded Minutes encountered by the selected DS1 interface in one second. The object returns the total number of Degraded Minutes encountered by the interface in past 15 minutes. NPS calculates the rate of Degraded Minutes per second. NPS calculates the metric to display average, minimum, and maximum rate of Degraded Minutes encountered by the selected interface.
DSx1BESs Rate • Average • Minimum • Maximum	Rate of Bursty Errored Seconds encountered by the selected DS1 interface in one second. The object returns the total number of Bursty Errored Seconds encountered by the interface in past 15 minutes. NPS calculates the rate of Bursty Errored Seconds per second. NPS calculates the metric to display average, minimum, and maximum rate of Bursty Errored Seconds encountered by the selected interface.
DSx1LESs Rate • Average • Minimum • Maximum	Rate of Line Errored Seconds encountered by the selected DS1 interface in one second. The object returns the total number of Line Errored Seconds encountered by the interface in past 15 minutes. NPS calculates the rate of Line Errored Seconds per second. NPS calculates the metric to display average, minimum, and maximum rate of Line Errored Seconds encountered by the selected interface.
DSx1LCVs/sec • Average • Minimum • Maximum	Rate of Line Coding Violations encountered by the selected DS1 interface in one second. The object returns the total number of Line Coding Violations encountered by the interface in past 15 minutes. NPS calculates the rate of Line Coding Violations per second. NPS calculates the metric to display average, minimum, and maximum rate of Line Coding Violations encountered by the selected interface.
DSx1CSSs Rate • Average • Minimum • Maximum	Rate of Controlled Slip Seconds encountered by the selected DS1 interface in one second. The object returns the total number of Controlled Slip Seconds encountered by the interface in past 15 minutes. NPS calculates the rate of Controlled Slip Seconds per second.

Metric	Description
	NPS calculates the metric to display average, minimum, and maximum rate of Controlled Slip Seconds encountered by the selected interface.

Glossary of SDH DS3 Metrics

Available only for DS3 Interfaces

Metric	Description
DSx3PCVs/sec • Average • Minimum • Maximum	Count of Path Coding Violations encountered by the selected DS3 interface in one second. The object returns the total number of Path Coding Violations encountered by the interface in past 15 minutes. NPS calculates the total number of Path Coding Violations per second. NPS calculates the metric to display average, minimum, and maximum number of Path Coding Violations encountered by the selected interface.
DSx3LESs Rate • Average • Minimum • Maximum	Rate of Line Errored Seconds encountered by the selected DS3 interface in one second. The object returns the total number of Line Errored Seconds encountered by the interface in past 15 minutes. NPS calculates the percentage of Line Errored Seconds per second. NPS calculates the metric to display average, minimum, and maximum rate of Line Errored Seconds encountered by the selected interface.
DSx3LCVs/sec • Average • Minimum • Maximum	Count of Line Coding Violations encountered by the selected DS3 interface in one second. The object returns the total number of Line Coding Violations encountered by the interface in past 15 minutes. NPS calculates the total number of Line Coding Violations per second. NPS calculates the metric to display average, minimum, and maximum number of Line Coding Violations encountered by the selected interface.
DSx3CCVs/sec • Average • Minimum • Maximum	Count of C-bit Coding Violations encountered by the selected DS3 interface in one second. The object returns the total number of C-bit Coding Violations encountered by the interface in past 15 minutes. NPS calculates the number of C-bit Coding Violations per second. NPS calculates the metric to display average, minimum, and maximum number of C-bit Coding Violations encountered by the selected interface.
DSx3SEFSs Rate	Rate of Severely Errored Framing Seconds encountered by the selected DS3 interface in one second.

Metric	Description
• Average • Minimum • Maximum	The object returns the total number of Severely Errored Framing Seconds encountered by the interface in past 15 minutes. NPS calculates the percentage of Severely Errored Framing Seconds per second. NPS calculates the metric to display average, minimum, and maximum rate of Severely Errored Framing Seconds encountered by the selected interface.
DSx3CSESs Rate • Average • Minimum • Maximum	Rate of C-bit Severely Errored Seconds encountered by the selected DS3 interface in one second. The object returns the total number of C-bit Severely Errored Seconds encountered by the interface in past 15 minutes. NPS calculates the percentage of C-bit Severely Errored Seconds per second. NPS calculates the metric to display average, minimum, and maximum rate of C-bit Severely Errored Seconds encountered by the selected interface.
DSx3PESs Rate • Average • Minimum • Maximum	Rate of P-bit Errored Seconds encountered by the selected DS3 interface in one second. The object returns the total number of P-bit Errored Seconds encountered by the interface in past 15 minutes. NPS calculates the percentage of P-bit Errored Seconds per second. NPS calculates the metric to display average, minimum, and maximum rate of P-bit Errored Seconds encountered by the selected interface.
DSx3PSESs Rate • Average • Minimum • Maximum	Rate of P-bit Severely Errored Seconds encountered by the selected DS3 interface in one second. The object returns the total number of P-bit Severely Errored Seconds encountered by the interface in past 15 minutes. NPS calculates the percentage of P-bit Severely Errored Seconds per second. NPS calculates the metric to display average, minimum, and maximum rate of P-bit Severely Errored Seconds encountered by the selected interface.
DSx3UASs Rate • Average • Minimum • Maximum	Rate of Unavailable Seconds encountered by the selected DS3 interface in one second. The object returns the total number of Errored Seconds encountered by the interface in past 15 minutes. NPS calculates the percentage of Errored Seconds per second. NPS calculates the metric to display average, minimum, and maximum rate of Errored Seconds encountered by the selected interface.

Metric	Description
DSx3CESs Rate • Average • Minimum • Maximum	Rate of C-bit Errored Seconds encountered by the selected DS3 interface in one second. The object returns the total number of C-bit Errored Seconds encountered by the interface in past 15 minutes. NPS calculates the percentage of C-bit Errored Seconds per second. NPS calculates the metric to display average, minimum, and maximum rate of C-bit Errored Seconds encountered by the selected interface.

Glossary of SONET/SDH Metrics

Available only for SONET/SDH Interfaces

Metric	Description
SonetSectionESs Rate • Average • Minimum • Maximum	Rate of Errored Seconds encountered by the selected SONET/SDH Section interface in one second. The object returns the total number of Errored Seconds encountered by the SONET/SDH Section interface in past 15 minutes. NPS calculates the rate of Errored Seconds per second. NPS calculates the metric to display average, minimum, and maximum rate of Errored Seconds encountered by the selected SONET/SDH Section interface.
SonetSectionSESs Rate • Average • Minimum • Maximum	Rate of Severely Errored Seconds encountered by the selected SONET/SDH Section interface in one second. The object returns the total number of Severely Errored Seconds encountered by the SONET/SDH Section interface in past 15 minutes. NPS calculates the rate of Severely Errored Seconds per second. NPS calculates the metric to display average, minimum, and maximum rate of Severely Errored Seconds encountered by the selected SONET/SDH Section interface.
SonetSectionSEFSs Rate • Average • Minimum • Maximum	Rate of Severely Errored Framing Seconds encountered by the selected SONET/SDH Section interface in one second. The object returns the total number of Severely Errored Framing Seconds encountered by the SONET/SDH Section interface in past 15 minutes. NPS calculates the rate of Severely Errored Framing Seconds per second. NPS calculates the metric to display average, minimum, and

Metric	Description
	maximum rate of Severely Errored Framing Seconds encountered by the selected SONET/SDH Section interface.
SonetSectionCVs/sec • Average • Minimum • Maximum	Rate of Coding Violations encountered by the selected SONET/SDH Section interface in one second. The object returns the total number of Coding Violations encountered by the SONET/SDH Section interface in past 15 minutes. NPS calculates the rate of Coding Violations per second. NPS calculates the metric to display average, minimum, and maximum rate of Coding Violations encountered by the selected SONET/SDH Section interface.
SonetLineESs Rate • Average • Minimum • Maximum	Rate of Errored Seconds encountered by the selected SONET/SDH Line interface in one second. The object returns the total number of Errored Seconds encountered by the SONET/SDH Line interface in past 15 minutes. NPS calculates the rate of Errored Seconds per second. NPS calculates the metric to display average, minimum, and maximum rate of Errored Seconds encountered by the selected SONET/SDH Line interface.
SonetLineSESs Rate • Average • Minimum • Maximum	Rate of Severely Errored Seconds encountered by the selected SONET/SDH Line interface in one second. The object returns the total number of Severely Errored Seconds encountered by the SONET/SDH Line interface in past 15 minutes. NPS calculates the rate of Severely Errored Seconds per second. NPS calculates the metric to display average, minimum, and maximum rate of Severely Errored Seconds encountered by the selected SONET/SDH Line interface.
SonetLineUASs Rate • Average • Minimum • Maximum	Rate of Unavailable Seconds encountered by the selected SONET/SDH Line interface in one second. The object returns the total number of Unavailable Seconds encountered by the SONET/SDH Line interface in past 15 minutes. NPS calculates the rate of Unavailable Seconds per second. NPS calculates the metric to display average, minimum, and maximum rate of Unavailable Seconds encountered by the selected SONET/SDH Line interface.
SonetFarEndLineESs Rate	Rate of Far End Errored Seconds encountered by the selected SONET/SDH Medium/Section/Line interface in one second.

Metric	Description
• Average • Minimum • Maximum	The object returns the total number of Far End Errored Seconds encountered by the SONET/SDH Medium/Section/Line interface in past 15 minutes. NPS calculates the rate of Far End Errored Seconds per second. NPS calculates the metric to display average, minimum, and maximum rate of Far End Errored Seconds encountered by the selected SONET/SDH Medium/Section/Line interface.
SonetFarEndLineSESs Rate • Average • Minimum • Maximum	Rate of Far End Severely Errored Seconds encountered by the selected SONET/SDH Medium/Section/Line interface in one second. The object returns the total number of Far End Severely Errored Seconds encountered by the SONET/SDH Medium/Section/Line interface in past 15 minutes. NPS calculates the rate of Far End Severely Errored Seconds per second. NPS calculates the metric to display average, minimum, and maximum rate of Far End Severely Errored Seconds encountered by the selected SONET/SDH Medium/Section/Line interface.
SonetFarEndLineCVs/sec • Average • Minimum • Maximum	Rate of Far End Coding Violations encountered by the selected SONET/SDH Medium/Section/Line interface in one second. The object returns the total number of Far End Coding Violations encountered by the SONET/SDH Medium/Section/Line interface in past 15 minutes. NPS calculates the rate of Far End Coding Violations per second. NPS calculates the metric to display average, minimum, and maximum rate of Far End Coding Violations encountered by the selected SONET/SDH Medium/Section/Line interface.
SonetFarEndLineUASs Rate • Average • Minimum • Maximum	Rate of Far End Unavailable Seconds encountered by the selected SONET/SDH Medium/Section/Line interface in one second. The object returns the total number of Far End Unavailable Seconds encountered by the SONET/SDH Medium/Section/Line interface in past 15 minutes. NPS calculates the rate of Far End Unavailable Seconds per second. NPS calculates the metric to display average, minimum, and maximum rate of Far End Unavailable Seconds encountered by the selected SONET/SDH Medium/Section/Line interface.
SonetPathESs Rate	Rate of Errored Seconds encountered by the selected SONET/SDH Path interface in one second.

Metric	Description
• Average • Minimum • Maximum	The object returns the total number of Errored Seconds encountered by the SONET/SDH Path interface in past 15 minutes. NPS calculates the rate of Errored Seconds per second. NPS calculates the metric to display average, minimum, and maximum rate of Errored Seconds encountered by the selected SONET/SDH Path interface.
SonetPathSESs Rate • Average • Minimum • Maximum	Rate of Severely Errored Seconds encountered by the selected SONET/SDH Path interface in one second. The object returns the total number of Severely Errored Seconds encountered by the SONET/SDH Path interface in past 15 minutes. NPS calculates the rate of Severely Errored Seconds per second. NPS calculates the metric to display average, minimum, and maximum rate of Severely Errored Seconds encountered by the selected SONET/SDH Path interface.
SonetPathCVs/sec • Average • Minimum • Maximum	Rate of Coding Violations encountered by the selected SONET/SDH Path interface in one second. The object returns the total number of Coding Violations encountered by the SONET/SDH Path interface in past 15 minutes. NPS calculates the rate of Coding Violations per second. NPS calculates the metric to display average, minimum, and maximum rate of Coding Violations encountered by the selected SONET/SDH Path interface.
SonetPathUASs Rate • Average • Minimum • Maximum	Rate of Unavailable Seconds encountered by the selected SONET/SDH Path interface in one second. The object returns the total number of Unavailable Seconds encountered by the SONET/SDH Path interface in past 15 minutes. NPS calculates the rate of Unavailable Seconds per second. NPS calculates the metric to display average, minimum, and maximum rate of Unavailable Seconds encountered by the selected SONET/SDH Path interface.
SonetFarEndPathESs Rate • Average	Rate of Far End Errored Seconds encountered by the selected SONET/SDH Path interface in one second. The object returns the total number of Far End Errored Seconds encountered by the SONET/SDH Path interface in past 15

Metric	Description
• Minimum • Maximum	minutes. NPS calculates the rate of Far End Errored Seconds per second. NPS calculates the metric to display average, minimum, and maximum rate of Far End Errored Seconds encountered by the selected SONET/SDH Path interface.
SonetFarEndPathSESs Rate • Average • Minimum • Maximum	Rate of Far End Severely Errored Seconds encountered by the selected SONET/SDH Path interface in one second. The object returns the total number of Far End Severely Errored Seconds encountered by the SONET/SDH Path interface in past 15 minutes. NPS calculates the rate of Far End Severely Errored Seconds per second. NPS calculates the metric to display average, minimum, and maximum rate of Far End Severely Errored Seconds encountered by the selected SONET/SDH Path interface.
SonetFarEndPathCVs/sec • Average • Minimum • Maximum	Rate of Far End Coding Violations encountered by the selected SONET/SDH Path interface in one second. The object returns the total number of Far End Coding Violations encountered by the SONET/SDH Path interface in past 15 minutes. NPS calculates the rate of Far End Coding Violations per second. NPS calculates the metric to display average, minimum, and maximum rate of Far End Coding Violations encountered by the selected SONET/SDH Path interface.
SonetFarEndPathUASs Rate • Average • Minimum • Maximum	Rate of Unavailable Seconds encountered by the selected SONET/SDH Path interface in one second. The object returns the total number of Unavailable Seconds encountered by the SONET/SDH Path interface in past 15 minutes. NPS calculates the rate of Unavailable Seconds per second. NPS calculates the metric to display average, minimum, and maximum rate of Unavailable Seconds encountered by the selected SONET/SDH Path interface.

Glossary of Packet Type Count Metrics

Metric	Description
NonUnicast - Packets (sum)	Total number of packets received and sent by the interfaces using the non-unicast protocol
NonUnicast - Packets In (sum)	Total number of packets received by the interfaces using the non-unicast protocol
NonUnicast - Packets Out (sum)	Total number of packets sent by the interfaces using the non-unicast protocol
Multicast - Packets (sum)	Total number of packets received and sent by the interfaces using the multicast protocol
Multicast - Packets In (sum)	Total number of packets received by the interfaces using the multicast protocol
Multicast - Packets Out (sum)	Total number of packets sent by the interfaces available using the multicast protocol
Unicast - Packets (sum)	Total number of packets received and sent by the interfaces using the unicast protocol
Unicast - Packets In (sum)	Total number of packets received by the interfaces using the unicast protocol
Unicast - Packets Out (sum)	Total number of packets sent by the interfaces using the unicast protocol
Broadcast - Packets (sum)	Total number of packets received and sent by the interfaces using the broadcast protocol
Broadcast - Packets In (sum)	Total number of packets received by the interfaces using the broadcast protocol
Broadcast - Packets Out (sum)	Total number of packets sent by the interfaces using the broadcast protocol
Unknown Protocol - Packets (sum)	Total number of packets received and sent by the interfaces using any protocol other than the following ones: • Unicast • Non-unicast • Multicast • Broadcast
Average Packet Size - Bytes (avg)	Average number of bytes received and transmitted by the selected interface for the selected time range. Calculated using the following method:

	`Volume - Bytes (sum) / Volume - Packets (sum)`
Average Packet Size - Bytes In (avg)	Average number of bytes received by the selected interface for the selected time range. Calculated using the following method: `Volume - Bytes In (sum) / Volume - Packets In (sum)`
Average Packet Size - Bytes Out (avg)	Average number of bytes transmitted by the selected interface for the selected time range. Calculated using the following method: `Volume - Bytes Out (sum) / Volume - Packets Out (sum)`

Glossary of Wireless LAN Metrics for CISCO-DOT11-ASSOCIATION-MIB

Available only on WLAN interfaces that support CISCO-DOT11-ASSOCIATION-MIB.

Metric	Description
NumActiveWirelessClients • Average • Minimum • Maximum	Number of wireless clients currently associating with the selected device on the selected interface You can select the device and interface using the NPS Topology Selector. NPS calculates the metric to display average, minimum, and maximum number of wireless clients associated to the selected interface.
NumActiveBridges • Average • Minimum • Maximum	Number of bridges currently associating with this device on the selected interface. You can select the device and interface using the NPS Topology Selector. NPS calculates the metric to display average, minimum, and maximum number of bridges associated to the selected interface.
NumActiveRepeaters • Average • Minimum • Maximum	Number of repeaters currently associating with this device on the selected interface. You can select the device and interface using the NPS Topology Selector. NPS calculates the metric to display average, minimum, and maximum number of repeaters associated to the selected interface.

StationsAssociated (sum)	Total number of stations associated with this device on the selected interface. Displays the number of stations associated to the interface since the device re-started.
StationsAuthenticated (sum)	Total number of stations authenticated with this device on the selected interface. Displays the number of stations authenticated on the interface since the device re-started.
StationsRoamedIn (sum)	Total number of stations roamed (transferred) from another device to this device on the selected interface Displays the number of stations transferred to the selected interface since the device re-started.
StationsRoamedAway (sum)	Total number of stations roamed (transferred) away from this device on the selected interface Displays the number of stations transferred from the selected interface since the device re-started.
StationsDeauthenticated (sum)	Total number of stations de-authenticated with this device on the selected interface Displays the number of stations for which the authentication were removed from the selected interface since the device re-started.
StationsDisassociated (sum)	Total number of stations disassociated with this device on the selected interface Displays the number of stations that were disassociated from the selected interface since the device re-started.

Glossary of Wireless LAN Metrics

Available only on WLAN interfaces – Following IEEE802dot11 performance policy

Metric	Description
SuccessfulRetryCount (sum)	Total number of times the MSDU is successfully transmitted after one or more re-transmissions.
RTSSuccessCount (sum)	Total number of CTS Clear to Send received in response to an RTS Request to Send.
TransmittedFragmentCount (sum)	Total number of acknowledged MPDU with an individual address in the address 1 field or an MPDU with a multicast address in the address 1 field of type Data or Management."
MaxedOutTransmitAttempts (sum)	Total number of times the MSDU is not transmitted successfully due to the number of transmit attempts exceeding either the dot11ShortRetryLimit or dot11LongRetryLimit.

ReceivedFragmentCount (sum)	Total number of successfully received MPDU of type Data or Management.
UndecryptableFrames (sum)	Total number of frames received with the WEP subfield of the Frame Control field set to one and the WEPOn value for the key mapped to the TA's MAC address indicates that the frame should not have been encrypted or that frame is discarded due to the receiving STA not implementing the privacy option.
RTSFailureCount (sum)	Total number of CTS signals failed to be sent in response to an RTS.
ACKFailureCount (sum)	Total number of times the ACK was not received when expected.
FrameDuplicateCount (sum)	Total number of frames received that the Sequence Control field indicates is a duplicate.
FCSErrorCount (sum)	Total number of FCS errors detected in received MPDU.

About Path Health Reports

The Path Health report displays icons that represent the nodes and interfaces in a path. A vertical chain of nodes and interfaces represents the path from one managed element to another. Each node and interface shows a series of small pie charts and trend lines depicting activity and performance for that element over the previous six hours.

With Path Health, you can analyze:

- The ratio of exceptions per metric over the last hour (one pie chart per metric)
- Metric values over the last six hours (one graph per metric)

They enable you to determine whether the values are static, rising steadily, falling steadily, or fluctuating.

1. From one of the NNMi inventory views, select two elements.
2. Path Health can only be launched from a Path View in NNMi. To view the Path View page, from the NNMi console, select **Action** > **Path View**.
3. From the Path View, select **Actions** > **Reporting-Path Health**.

   The Path View page shows the following menus:

   - **Source Node**: The first element of the selected path
   - **Destination Node**: The last element of the selected path
4. Select **Actions** and **Reporting-Path Health** to create the Path Health report.

If the Path View shows multiple paths between hops, NNMi will ask you to select a specific path. To select, click the appropriate connecting line within NNMi. The colors on the screen will change when you make the selection. The Path Health option under Actions does not function until your selection is complete.

Launching Path Health Reports for Nodes with Multiple Paths

The NNMi console can display more than one path between your source and destination nodes. When you request a Path Health report using the **Actions** > **Reporting-Path Health** menu, the left-most icon on the path changes color if multiple paths exist between the source and destination nodes. To launch a Path Health report, select a particular path by clicking every visible node on the path and selecting **Actions** and **Reporting-Path Health**.

Features and Defaults

Path Health pulls data from the following extension packs:

- Component Health
- Interface Health

From the Component Health collections, Path Health generates the following statistics for a node in a path:

- CPU exceptions last hour / CPU utilization last six hours
- Memory exceptions last hour / Memory utilization last six hours
- Buffer exceptions last hour / Buffer utilization last six hours

From the Interface Health collections, Path Health generates the following statistics for an interface in a path:

- Utilization exceptions last hour / Utilization over the last six hours
- Discard exceptions last hour / Number of discards per poll over the last six hours
- Error exceptions last hour / Number of errors per poll last six hours

The Path Health report pulls data from the Component Health Live and Interface Health Live tables.

How to Use Path Health

You can monitor the fault conditions that show up in a Path View. The performance data in Path Health can help you determine the cause.

If a node, interface, or component in the Path Health report shows exceptions, you can easily find more information by clicking the links for node, interface, or component. For example, if a node shows CPU exceptions, open the Report Menu, select an appropriate report, and drill down on the node until you identify the specific component that is reporting problems.

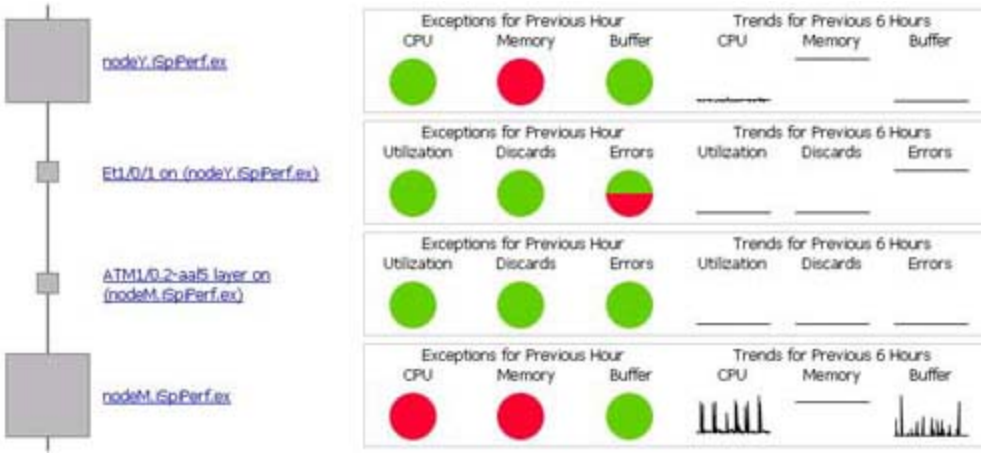
Path Health Report

The Path Health report displays icons that represent the nodes and interfaces in a path. A vertical chain of nodes and interfaces represents the path from one managed element to another. Each node and interface shows a series of small pie charts and trend lines depicting activity and performance for that element over the previous six hours.

With Path Health, you can analyze:

- The ratio of exceptions per metric over the last hour (one pie chart per metric)
- Metric values over the last six hours (one graph per metric)

The selected Path View is displayed as follows.



The pie chart enables you to view the comparison between the number of polls that are below or above the set threshold. The data in the pie chart represents the samples collected within the last hour.

The line graphs track sampled data over the previous six hours.

Unknown Items

Unknown icons (represented by ?) appear in the Path Health report for a device or interface that is not being polled for the required data. The Path Health report presents Component Health data for each node and Interface Health data for each interface. It is possible that a node can support the Interface Health collections (MIB-II), but not the Component Health collections. The report could, therefore, display data for the inbound and outbound interfaces on a node but not for the node itself.

About Self Diagnostics Reports

The Self Diagnostics Extension Pack monitors the health of the processes that function within NPS.

Reports enable you to:

- Investigate how the processes are performing.
- Analyze if the metrics measuring NPS performance are within an acceptable (normal) range.
- Compare the performance of NPS processes for a selected time range.
- Analyze the performance of NPS processes during the busiest time of the day.

Calendar Report

The Calendar report displays hourly statistics for two metrics in a single, extended graph spanning multiple days.

Features and Defaults

The default settings are:

- Task Categories, Task Types, and Task Names= All
- Dates/Times = Last 31 days

- Metric(s) Shown on Y1 Axis = Process Time (secs)(avg)
- Metric(s) Shown on Y2 Axis = Process Time (secs)(min)

The default view shows data for the current month. When the NPS collects enough data, you can use the Until Now option to look at data for the previous 70 days.

How to Use This Report

Use this report to:

- Observe gradual trends over time
- Observe isolated spikes
- Verify that an abnormal condition has returned to normal
- Make comparisons

This report also reveals:

- Day-of-week patterns
- Hour-of-day patterns

Chart Detail Report

The Chart Detail report enables you to perform a trend analysis for the health and performance of NPS processes based on historical performance data.

The report displays a comparative analysis of the selected metrics for each time unit. For example, to compare how the average Threshold Exception Rate was affected by variance in average process time per millisecond for the past week, you would generate a Weekly Performance Diagnostics report for the selected node group.

You can select two or more task types, task names, extension packs, and so on.

With this report you can:

- Analyze the trend of network health and performance for multiple task types, task names, extension packs, and so on based on one unit of time. Each unit of time is called a Display Grain. Each Display Grain is measured as follows:
  - 5 minutes for hourly report
  - 1 hour for daily report
  - One day for weekly report
  - One day for monthly report
- Identify any ups and downs in the health and performance of NPS processes
- Compare the health and performance of more than two task types, task names, extension packs, and so on based on historical health and performance data

The following filters are available in the Time Controls pane:

- Start Date/Time
- Time Range
- Display Grain

- Hour of day
- Day of Week

Features and Defaults

The graph tracks metrics over the selected time period. The default settings are:

- Task Categories, Task Types, and Task Names = All
- Primary metric = Process Time (secs)(avg)
- Secondary metric = Process Time (secs)(min)

To add another primary or secondary metric, click **Options** and  the **Add group** button.

To remove a primary or secondary metric you already added, click **Options** and  the **Remove group** button.

You can view the data in tabular format by clicking **Options** and selecting **Table**. To view both the chart and the table, click **Options** and select **Chart and Table**.

Heat Chart Report

The Heat Chart report tracks the hourly performance of a single metric. The default metric is Process Time (secs)(avg). The default time period is the last 24 hours. Performance is color-coded, which makes it easy to spot a condition that is gradually worsening and to distinguish satisfactory performance from unsatisfactory performance.

The following filters are available in the Time Controls pane:

- Start Date/Time
- Time Range
- Display Grain
- Auto Refresh
- Hours of Day
- Day of Week

Features and Defaults

The legend at the top of the report ties a range of normalized performance values to a particular color. Any value within that range gets that color. Beneath the legend, each day of the month is listed left to right, day 1 through 31. Down the side of the report is each hour of the day. Each cell inside the table is color-coded and indicates a specific value. You can move the mouse pointer on a cell to view raw data.

The default settings are:

- Time Period = Last 24 hours
- Hour of Day = All
- Day of Week = All
- Metric = Process Time (secs)(avg)

Managed Inventory Report

The Managed Inventory report displays a list of available topology attributes. You can use the available attributes to filter specific data and create a report. The report presents the list of attributes in the form of a table. The Count column indicates the number of entries for each attribute.

For the topology item Extension Pack, the Count column indicates the number of available extension packs on the NPS system.

For the topology item Task Category, the Count column indicates the number of task categories created by NPS.

Monitor the Health of NPS and Extension Packs

The reports generated by the Self Diagnostics Extension Pack help you monitor the health and performance of the processes that constitute the core functionality of NPS and the Extension Packs on the NPS system.

The Self Diagnostics Extension Pack identifies every process on the NPS system as a task. Every task is grouped under relevant task type, task category, and Extension Pack.

Task Categories

- ETL
- Report Generation

Task Types

ETL:

- build_groupcache_from_db
- build_topcache_from_db
- checkAggregates
- process_group_dump_file
- process_metricsfiles
- process_metricsfiles->bulkload archive table
- process_metricsfiles->bulkload live table
- process_metricsfiles->preprocessing
- process_retention->aggregate table
- process_retention->live table
- process_retention->archive table
- process_retention->timeDimension table
- process_summary->Summary Child Proc
- process_summary->Summary Parent Proc
- process_topodump_file

Report Generation:

- Calendar
- Chart Detail
- Dashboard
- Headline
- Heat Chart
- Most Changed
- Managed Inventory
- Top N

Tasks

NPS monitors and administers essential processes as tasks running on the NPS system. All processes are introduced by different Extension Packs on the system. The processes are named according to the following format:

extension_pack_name>.<*task_category*>.<*task_type*>

Metrics

You can generate reports for the following metrics:

- Process Time (time in seconds for the task to complete)
- Number of Rows (applies to select tasks, such as ETL bulk loads)
- Available System Memory: Shows free memory (free and cached memory on Linux), which enables you to see if your system's memory usage is increasing, thus decreasing available memory. Low available memory can degrade system performance.
- Available Disk Space: Enables you to monitor disk usage in the Data Directory file system. By plotting the Available Disk trend over time, you can see if your disk usage has reached a steady state, or if you are on a trajectory to run out of disk space.

Most Changed Report

The Most Changed report compares performance over two different (consecutive) time periods and ranks processes by the amount of change. The sort order is most-changed to least-changed.

Features and Defaults

The report contains a table with the following columns:

- Performance for the previous time period
- Performance for the selected time period
- Growth, expressed as a percentage increase
- Change

The default settings are:

- Dates/Times = Last Day (and the day before)
- Hour of Day = All

- Day of Week = All
- Rank Metric = Process Time (secs)(avg))
- Top N Option = Top 10

When you select a month, the report compares two months (the month you selected and the previous month). When you select a week, the report compares two weeks (the week you selected and the previous week).

The report provides data for one metric.

Peak Period Report

The Peak Period report ranks the performance of an NPS process during the busiest time of the selected time range.

With this report, you can:

- Identify the performance and utilization of the selected metrics during the peak period.
- Identify the NPS processes that have the highest or lowest performances during the peak period.
- Compare the performance for multiple NPS processes during the peak period using this report.

Peak Period Report Options

- Top / Bottom N
- Metric
- Grouping by Time Period

This report tracks up to six metrics over the selected time period.

To add another metric, click **Options** and  (the **Add group** button).

To remove a metric you already added, click **Options** and  (the **Remove group** button).

To select a range of value for the metric, click  and select a range of metric value the report should consider. For example, to see the top five interfaces with average memory utilization between 10% and 90%, select 10 as the **Lowest value** and 90 as the **Highest value**.

By default, the report groups data by Time Period. You can select multiple grouping attributes with  . To remove a grouping attribute, use  .

Use this report to identify the period when NPS process performance is the lowest.

Check this report once a day to see which NPS processes need special attention.

Top 10 Task Duration Report

The report monitors the Top 10 ETL and report generation processes and tracks the time taken by each process during the selected time range.

Top N Report

The Top N report ranks NPS processes by the metric you select. You can use this report to spot the processes that performed at the extremes. You can also analyze historical data for the processes that exhibit unusual performance levels.

The following topology filters are available:

- Extension Pack
- Task Category
- Task Type
- Task Name

With this report you can:

- Rank the performance of the extension packs and tasks running on your Performance iSPI server.
- Detect the underlying reason of a persistent problem with a process. You can compare the performance for multiple tasks.

Example

Say that some of the processes in your network are performing poorly. You can group the processes that report the highest processing time so that the process with the highest processing time is ranked first.

Top N Report Options

The following options are available:

- **Top/Bottom 'N'**
  Select a rank between top or bottom 5, 10, 25, 50, 100, all descending, and all ascending for selected NPS processes.
- **Metric**
  Select the metric on which you want to generate the report. This metric is used to rank the report.
- **Display Time Series Chart**
  Select Yes to view the detail chart with the table. Select No to hide the chart and display only the table. The created Top N Report displays the graphical representation of the metric values for the NPS processes over the selected time range.
- **Grouping By**
  Enables you to group the report data based on a specific parameter. Click to add a subgroup.

This report tracks up to six metrics for each metric type over the selected time period.

To add another metric, click **Options** and  (the **Add group** button).

To remove a metric you already added, click **Options** and  (the **Remove group** button).

To select a range of value for the metric, click  and select a range of metric value the report should consider. For example, to see the average process time for the Self Diagnostics extension

pack within a range of 100 and 500 seconds, select 100 as the minimum value and 500 as the maximum value.

By default, the report groups data by extension pack. You can select multiple grouping attributes with  . To remove a grouping attribute, use  .

By default, the Top N Report is displayed without the Time Series Chart. To view the detail table, click **Display Time Series Chart**.

Check this report once a day to see which extension pack or process needs special attention.

Check this report periodically throughout the day to see which extension packs or processes are performing at the extremes and need special attention.

Top N Chart Report

The Top N Chart report ranks NPS processes by the metric you select.

With this report, you can:

- Spot NPS processes that perform at the extremes.
- Detect NPS processes that have a performance problem.

Top N Chart Options

The following options are available:

- Top / Bottom N
- Metric
- Grouping By

This report tracks up to six metrics over the selected time period.

To add another metric, click **Options** and  (the **Add group** button).

To remove a metric you already added, click **Options** and  (the **Remove group** button).

To select a range of value for the metric, click  and select a range of metric value the report should consider. For example, to see the top five interfaces with average availability between 10% and 90%, select 10 as the **Lowest value** and 90 as the **Highest value**.

By default, the report groups data by extension pack. You can select multiple grouping attributes with  . To remove a grouping attribute, use  .

Check this report once a day to see which NPS processes need special attention.

About Reportlets

In a large enterprise network, the NNM iSPI Performance products (HP NNM iSPI Performance for Metrics, HP NNM iSPI Performance for Quality Assurance, and HP NNM iSPI Performance for Traffic) can produce a large amount of data and large cardinality. Enterprise networks often have a very large number of unique IP addresses, source nodes, destination nodes, virtual circuits, interfaces, and components that each produce a large amount of data. Generating reports can therefore be time-consuming.

Reportlets enable you to generate quick impressions of the larger reports using the NNM iSPI Performance dashboard.

To view reportlets:

1. Log in to the NPS home page.
2. On the left navigation panel, select **Dashboard Reportlets**.
3. Select an extension pack and a reportlet.

You can also create custom dashboards using the reportlets (see "Creating Custom Dashboards Using the BI Server Portal").

Simple Bar Chart

Compares the performance of two metrics for the selected time range.

Enables you to:

- Compare the performance trends of multiple metrics.
- Analyze how the value of the secondary metric increases or decreases based on the increase or decrease in the value of the primary metric.

This reportlet supports two metrics.

Simple Bar and Line Chart

Displays the trend of NPS process performance for the selected time range using the following values:

- **Primary Metric** on the bar chart
- **Secondary Metric** on the line chart

Enables you to:

- Compare the performance trends of multiple metrics.
- Analyze how the value of the secondary metric increases or decreases based on the increase or decrease in the value of the primary metric.

This reportlet supports two metrics.

Calendar

Displays a comparative study of the selected **Primary Metric** and **Secondary Metric**

The default display grain is set to 1 hour. You cannot change the display grain of this reportlet.

Enables you to monitor:

- Daily system resource utilization by the NPS processes
- Volume of data processed by the NPS processes for the selected time range
- Performance of the NPS processes for the selected time range

This reportlet supports two metrics.

Gauge

Evaluates the metric for the selected point of time.

Enables you to:

- Measure the daily performance of the selected metric.
- Detect any abnormal or unexpected performance level.

This reportlet supports one metric.

Heat Chart

Grades the performance of the selected metric for the selected time range.

Metric performance is aggregated based on an hourly display grain.

Enables you to:

- View how NPS process performance is affected by a varying metric.
- Compare the hourly performance of the selected metric.
- Detect the time range when NPS process performance was affected adversely because of the fluctuating metric value.

This reportlet supports one metric.

Metric Snapshot

Displays metric performance for the selected time range.

Enables you to:

- Build a performance history for the selected metric and analyze how metric performance changes over time. Doing this can help you to determine the baseline value for the metric
- Compare the performance of multiple metrics over a specified time range. You can generate a snapshot report for a single metric, save the snapshot report for various metrics, and compare the performance of each metric over a time range.

This reportlet supports one metric.

Most Changed

Compares metric performance between yesterday and today.

Aggregates daily metric utilization and ranks performance in descending order.

Enables you to:

- Measure performance fluctuations for NPS processes.
- Detect the Top N NPS processes that have a common performance or utilization problem.

You can enhance the report usability using the following features:

- **Top N**
- **Grouping By**

This reportlet supports one metric.

Multimetric Chart

Analyzes the utilization trend for selected metrics over a selected time range.

Enables you to:

- Perform a comparative analysis of selected metrics for each display grain. The default display grain is 1 hour.
- Analyze the reason for ups and downs in NPS process performance.
- Detect any persistent problem in NPS process performance.

This reportlet supports up to six metrics.

Simple Chart

Analyzes the utilization trend for selected metrics over a selected time range.

Enables you to:

- Perform a comparative analysis of the selected metrics for each display grain. The default display grain is 1 hour.
- Analyze the reason for ups and downs in NPS process performance.
- Detect any persistent problem in NPS process performance.

This reportlet supports two metrics.

Simple Table

Analyzes the utilization trend for selected metrics over a selected time range.

The default display grain is 1 hour.

Enables you to:

- Analyze the hourly performance of the metrics.
- Detect any abnormal or unexpected NPS process performance.
- Analyze how the value of the secondary metric increases or decreases based on the increase or decrease in the value of the primary metric.

This reportlet supports two metrics.

Sparkline

Evaluates the trend of metric value change over a selected time range.

Enables you to:

- Analyze variations in performance for the selected metric.
- Decide whether the expected behavior for the selected metric should be reassessed.

This reportlet supports one metric.

Top N Chart

Ranks the individual contribution of each metric for NPS process performance over a selected time range.

The performance of the NPS process is aggregated on hourly basis.

Enables you to:

- Spot the NPS processes for which the performance metrics present extreme values.
- Investigate the aggregated data for NPS processes that exhibit unusual utilization levels.
- Select the metric on which you want to generate the report. The metric you select is used to rank the NPS processes.
- Group the report data on the basis of on a specific parameter. To add a subgroup, click  the **Add Group** button.

This reportlet supports one metric.

Top N Line Chart

Ranks the utilization trend for the selected metrics over a selected time range.

The performance of the NPS process is aggregated on an hourly basis.

Enables you to:

- Spot the NPS processes for which the performance metrics present extreme values.
- Investigate aggregated data for NPS processes that exhibi unusual utilization levels.
- Select the metric on which you want to generate the report. The metric you select is used to rank the NPS processes.
- Group the report data on the basis of a specific parameter. To add a subgroup, click  the **Add Group** button.

This reportlet supports one metric.

Top N Stacked Chart

Ranks the individual contribution of each NPS process based on selected metrics.

The performance of each NPS process is aggregated for the default display grain of 1 hour.

Enables you to:

- Spot the NPS processes for which the performance metrics present extreme values.
- Investigate the aggregated data for NPS processes that exhibit unusual utilization levels.

This reportlet supports one metric.

Top N Table

Ranks the NPS processes based on the selected metric.

Enables you to:

- Spot the NPS processes for which the performance metrics present extreme values.
- Investigate the aggregated data for NPS processes that exhibit unusual utilization levels.
- Select the metric on which you want to generate the report. The metric you select is used to rank the NPS processes.
- Group the report data on the basis of a specific parameter. To add a subgroup, click  the **Add Group** button.

This reportlet supports one metric.

Top N Table with Bars

Ranks the NPS processes based on the selected metric and displays a horizontal bar to depict the aggregated metric value.

Enables you to:

- Spot the NPS processes for which the performance metrics present extreme values.
- Investigate the aggregated data for NPS processes that exhibit unusual utilization levels.
- Select the metric on which you want to generate the report. The metric you select is used to rank the NPS processes.
- Group the report data on the basis of a specific parameter. To add a subgroup, click  the **Add Group** button.

This reportlet supports one metric.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