# HP NNM iSPI Network Engineering Toolset Software

For the Windows® operating system

Software Version: 9.10

## Planning and Installation Guide

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# Contents

# Part 1: HP Network Node Manager iSPI Network Engineering Toolset Software (February 2014)

This part of the book provides the instructions to install the NNM iSPI Network Engineering Toolset Software 9.10 released in February, 2014.

For instructions to install the NNM iSPI Network Engineering Toolset Software 9.10 released in March 2011, see Part 2.

# Chapter 1: Introducing HP NNM iSPI Network Engineering Toolset Software

The HP NNM iSPI Network Engineering Toolset Software (NNM iSPI NET) extends the powerful network management capabilities of NNMi by providing additional troubleshooting and diagnostic tools for network engineers. Purchasing NNM iSPI NET provides the following functionality:

- NNM iSPI NET functionality in the NNMi console (enabled with an NNM iSPI NET license):

  - SNMP trap analytics provide summary and detailed information about SNMP trap traffic in the network

  - Visio export functionality exports NNMi topology map data to Microsoft® Visio files.

  > **Note:** For information about the supported hardware, operating systems, and web browsers for the NNMi console as well as information about the supported versions of Visio, see the *NNMi System and Device Support Matrix.*

- The HP-provided diagnostic flows gather diagnostic information when NNMi detects certainnetwork incidents.

- The diagnostics server is an embedded packaging of HP Operations Orchestration (HP OO). If you already have the full HP OO product, you can install the NNM iSPI NET diagnostic flows on that server.

- If you have the full HP OO product, you can also import HP OO flow definitions into NNMi and then assign these flows to run when NNMi detects certain network incidents.

  > **Note:** For information about the supported hardware, operating systems, and web browsers for the embedded diagnostics server as well as information about the supported versions of the full HP OO product, see the *NNMi System and Device Support Matrix.*

## How is NNM iSPI NET Installed?

The NNM iSPI NET SNMP trap analytics and Visio export functionality are automatically installed with NNMi. The diagnostic flows and diagnostics server must be installed from separate installation media. See "Installing the NNM iSPI NET Diagnostics Server and Diagnostic Flows" on page 15.

## How is NNM iSPI NET Licensed?

When you install NNMi, the NNM iSPI NET functionality is enabled with a temporary Instant-On license key. Purchase a permanent NNM iSPI NET license separately from your permanent NNMi license. See "License NNM iSPI NET" on page 22 for details.

# Chapter 2: Preinstallation Tasks

This chapter contains checklists for the tasks that you must complete before installing NNM iSPI NET, including where to find information on supported hardware and software.

The NNM iSPI NET SNMP trap analytics and the Visio export functionality are automatically installed during NNMi installation. These features share the NNMi installation requirements, which are documented in the *NNMi System and Device Support Matrix.*

The NNM iSPI NET diagnostics are installed separately using the NNM iSPI NET installation media. For specific supported configurations, this installation can be on the same system as NNMi. The following section describes how you can determine the hardware and software prerequisites for the NNM iSPI NET diagnostics server.

## Supported Hardware and Software

Before installing the NNM iSPI NET diagnostics, read the information about supported hardware and software described in "Table 1 Software and Hardware Preinstallation Checklist" below.

**Table 1 Software and Hardware Preinstallation Checklist**

| Complete (y/n) | Documentation to Read |
| --- | --- |
| | *HP NNM iSPI NET Release Notes* <br><br> • **Filename** = `releasenotes_en.html` <br><br> • **Media** = NNM iSPI NET installation DVD  (root directory) |
| | *NNM iSPI NET Diagnostics Server System and Device Support Matrix* <br><br> • **Filename** = `supportmatrix_en.html` <br><br> • **Media** = NNM iSPI NET installation DVD (root directory) |

**Note:** HP updates the *NNM iSPI NET Diagnostics Server System and Device Support Matrix* as new information becomes available. Before you begin to install the NNM iSPI NET diagnostics server, check for the most recent NNM iSPI NET support matrix at this web site:

**http://h20230.www2.hp.com/selfsolve/manuals**

(You must have an HP Passport user ID to access this web site.)

## NNMi Management Server Preparation

In a diagnostic flow, the first step is to log on to the device. NNM iSPI NET uses the device credentials that NNMi stores. To specify credentials for a device, follow these steps:

1. Open the NNMi console.

2. Navigate to the **Configuration** workspace.

3. Select the **Communication Configuration** form.

4. Use the Default Device Credentials tab to create default device credentials.

5. If some devices have credentials that differ from the default settings, use the Regions and Specific Node Settings tabs to define those credentials.

> **Note:** Device credentials are only needed on devices for which diagnostic flows will be run. See the *NNM iSPI NET Diagnostics Server System and Device Support Matrix* for details about supported devices.

# Diagnostics Server System Preparation

The NNM iSPI NET media includes an embedded version of HP Operations Orchestration (HP OO) Central with restricted capabilities. The NNM iSPI NET diagnostic flows can be run by this embedded HP OO Central. Alternatively, you can use an HP OO Central that is already installed in your environment.

If you plan to use the embedded HP OO Central, you must identify a system in your environment on which to install the diagnostics server. You can install the embedded NNM iSPI NET diagnostics server on the same system as NNMi, *if* NNMi is installed on a system that has sufficient resources and is running the correct operating system version.

If a supported version of the full HP OO product is already running in your environment, you can install the NNM iSPI NET diagnostics flows onto the existing HP OO Central server, or you can install the complete NNM iSPI NET diagnostics server onto a different system.

> **Note:** For information about the supported hardware, operating systems, and web browsers for the embedded diagnostics server as well as information about the supported versions of the full HP OO product, see the *NNM iSPI NET Diagnostics Server System and Device Support Matrix*

## *Installing and Configuring MySQL*

*Skip this section if you want to use an HP OO Central that is already installed and configured in your environment.*

If you want to use HP OO Central that is embedded with the NNM iSPI NET media, you must install and configure MySQL 5.1 first. You can install MySQL on the system where you plan to install the NNM iSPI NET, or on a remote system.

You can download MySQL 5.1 from **http://www.mysql.com** and install it by following the instructions in the MySQL documentation.

After successfully installing MySQL, you must create a new databases and name it `nnminet`. Also, create a new database user named `nnminet_user`.

To create the user, run the following statement:

**CREATE USER 'nnminet_user'@'***<iSPI_NET_IP_Address>***' identified by '***<password>***';**

In this instance, *<iSPI_NET_IP_Address>* is the IP address of the system where you plan to install NNM iSPI NET and *<password>* is the password that you want to assign to the user `nnminet_user`.

> **Tip:** Use only the IP address in the above statement; do not use the fully qualified domain name.

See the MySQL documentation for more information about creating databases and users.

After creating `nnminet_user`, you must grant all privileges to the user by running the following statement:

**GRANT ALL ON nnminet.\* TO 'nnminet_user'@'***<iSPI_NET_IP_Address>***';**

In this instance, *<iSPI_NET_IP_Address>* is the IP address of the system where you plan to install NNM iSPI NET diagnostic server.

> **Tip:** Use only the IP address in the above statement; do not use the fully qualified domain name.

# *Creating New SSL Certificate Files on an Existing HP OO Central Server*

*Skip this section if you want to use the HP OO Central that is embedded with the NNM iSPI NET media.*

If you plan to use an existing HP OO Central server for NNM iSPI NET diagnostic flows, you must recreate SSL certificate files for the NNM iSPI NET diagnostics server installer. The installer looks for these files in a specific location. You must recreate the files before installing the NNM iSPI NET diagnostic flows.

The NNMi SSL communication stack enforces hostname verification. However, HP OO Central does not include hostnames in its SSL certificates by default.

You must create new certificates, which contain HP OO Central keystore entries that include the fully qualified domain name (FQDN) of the HP  OO Central server.

> **Note:** The NNM iSPI NET embedded diagnostics server includes a hostname in its default SSL certificates. The information in this section only applies to existing HP OO Central servers.

To create new SSL certificates, follow these steps:

> **Note:** These steps will replace the default HP OO SSL certificates with regenerated certificates. As a result, other HP Software products, components,or solutions (including HP

OO Studio) that depend on the default SSL certificates of this HP OO Central server will not work any longer.

If you use products and components that depend on the default SSL certificates, do not follow these steps and plan to use a different installation of HP OO (or use the HP OO that is embedded with the NNM iSPI NET installation DVD).

1. Log on to the HP OO Central server.

2. Back up the following files:

   - `%ICONCLUDE_HOME%\Central\conf\rc_keystore`

   - `%ICONCLUDE_HOME%\ras\Java\Default\webapp\conf\ras_keystore.jks`

3. Make sure the *NNM iSPI NET installation DVD*is mounted on the system.

4. Go to the media root, and then run the following command:

   **adjustcerts.bat "%ICONCLUDE_HOME%"** *<OO_SERVER_FQDN>*

   In this instance, *<OO_SERVER_FQDN>* is the fully qualified domain name (FQDN) of the HP OO Central server.

   The command recreates the HP OO Central SSL certificate; the newly created certificate includes the FQDN of the HP OO Central server.

# *Checklist*

The following table provides a checklist for preparing the diagnostic server:

**Table 2 Diagnostics Server Preparation Checklist**

| Complete (y/n) | Diagnostics Server Preparation |
|---|---|
|  | If you plan to use the embedded NNM iSPI NET diagnostics server, identify unused ports that can be assigned as the HTTP and HTTPS port numbers for the diagnostics server. Typical values include the following:<br><br>• 80 or 8080 for HTTP (default is 8080)<br><br>• 443 or 8443 for HTTPS (default is 8443) |
|  | If you plan to use an HP OO Central already installed in your environment, gather the following information:<br><br>• The HTTP and HTTPS port numbers used by HP OO Central<br><br>• The password for HP OO Central admin user |

**Table 2 Diagnostics Server Preparation Checklist, continued**

| Complete (y/n) | Diagnostics Server Preparation |
|---|---|
| | If you plan to use an HP OO Central already installed in your environment, and have not created SSL certificates using the server's fully qualified hostname, you must create new SSL certificate files so the installer can install diagnostic flows. See "Creating New SSL Certificate Files on an Existing HP OO Central Server" on page 11. |
| | When you plan to use the embedded HP OO, you must install MySQL in your environment prior to installing NNM iSPI NET.<br><br>If MySQL is installed on a separate system from the NNM iSPI NET diagnostics server, the MySQL server must permit remote access for the database user. While using a remote MySQL server, note down the hostname or IP address of the server.<br><br>You must create a new databases and name it `nnminet`, and then create a new database user named `nnminet_user`. |
| | Gather the following NNMi information:<br><br>• The hostname or IP address of the NNMi management server<br><br>• The HTTP port of the NNMi management server<br><br>• The password for the NNMi `system` user |
| | The NNM iSPI NET diagnostics server installer requires an HTTP connection to the NNMi management server. Verify that this access is available. |

**Table 2 Diagnostics Server Preparation Checklist, continued**

| Complete (y/n) | Diagnostics Server Preparation |
|---|---|
| | Verify that the diagnostics server system and the NNMi management server agree on the hostname of the diagnostics server system. The installer uses the hostname of the diagnostics server system when generating an SSL certificate. This certificate is used to secure communication between the diagnostics server and NNMi. The hostname in the SSL certificate must match the hostname that NNMi uses for the diagnostic server system.<br><br>If you are not sure that NNMi can identify this hostname as the diagnostic server hostname, follow these steps:<br><br>1. Log on to the NNMi management server.<br><br>2. Ping the diagnostics server using its hostname:<br><br>   ■ If the ping succeeds and matches the IP address of the diagnostics server system, you have a match.<br><br>   ■ If the ping fails or has the wrong IP address, you must find a hostname for the diagnostics server system that is recognized by both the NNMi management server and the diagnostics server. |
| | Install and enable a supported web browser if one is not already installed. For details, see the *NNM iSPI NET Diagnostics Server System and Device Support Matrix*. |

# Chapter 3: Installing the NNM iSPI NET Diagnostics Server and Diagnostic Flows

This chapter guides you through the process of installing and licensing NNM iSPI NET.

> **Note:** If NNMi is installed on a system that has sufficient resources and is running the correct operating system version, you can install the embedded NNM iSPI NET diagnostics server on the same system. See "Preinstallation Tasks" on page 9.

Two installation scenarios are described separately in the following sections:

- If HP OO Central is not installed on the system, the NNM iSPI NET diagnostics server installer installs the NNM iSPI NET diagnostics in their entirety, including the diagnostics server. The installer also sets up the binding between the diagnostics server and the NNMi management server.

- If HP OO Central is already installed, the NNM iSPI NET diagnostics server installer installs the NNM iSPI NET diagnostic flows and sets up the binding between HP OO Central and the NNMi management server.

Before you begin, complete the requirements in "Preinstallation Tasks" on page 9.

## Installing NNM iSPI NET

To install NNM iSPI NET on Windows, first install NNMi as described in the *NNMi 9.10 Interactive Installation Guide*. This installation provides the SNMP trap analytics and the Visio export functionality. Then, install the NNM iSPI NET diagnostics server and diagnostic flows.

> **Note:** The NNM iSPI NET diagnostics server installer requires an HTTP connection to the NNMi management server.

Use the procedure that applies to your situation:

- "Installing the NNM iSPI NET with the Embedded HP OO" below

- "Installing the NNM iSPI NET on an Existing HP OO System" on page 18

### *Installing the NNM iSPI NET with the Embedded HP OO*

If you install the NNM iSPI NET diagnostics server and flows on a system that does not have an HP OO Central already installed, the installer program installs the HP OO software that is embedded with the NNM iSPI NET installation DVD.

To install NNM iSPI NET with the embedded HP OO, follow these steps:

1. Log on as administrator or root to the system where you plan to install the NNM iSPI NET diagnostics.

2. Insert the NNM iSPI NET installation DVD into the DVD-ROM drive, or download the electronic installation media.

3. In the root directory of the installation media, run the following file:

   *On Windows 64-bit*

   `setup_x64.exe`

   *On Windows 32-bit*

   `setup.exe`

   The installation wizard opens.

4. Click **Next**, and then accept the license agreement.

   The Configuration Parameters screen appears.

5. Review the fields provided on the Configuration Parameters screen.

6. Specify the following details:

   - *Optional.* Change the installation directory for the embedded HP OO Central.

     Default installation directories are:

     `C:\Program Files\Hewlett-Packard\Operations Orchestration`

   - Type the HTTP and HTTPS ports for OO.

     By default, 8080 (HTTP) and 8443 (HTTPS) are populated in the fields. If these ports are not free on the system, make necessary changes.

     > **Note:** Communication between the embedded HP OO Central web application and the HP OO Central web client is over secure connections, using the HTTPS protocol. The HTTP port makes it possible for client users to type an HTTP protocol address in the browser and be redirected to the secure connection.

   - Type a password for HP OO Central's `admin` account. At the end of the installation process, you can use this password to log on to HP OO Central as an `admin` user.

   - Verify the current system's hostname for SSL certificate generation. Always use the fully qualified domain name of the system (and not the IP address).

**Note:** If you are installing the NNM iSPI NET diagnostics server on a separate system from NNMi, the hostname in this field must match the hostname that the NNMi management server identifies as the diagnostics server's hostname.If you are not sure that the NNMi management server can identify the diagnostics server's hostname, follow the steps in "Diagnostics Server System Preparation" on page 10 .

7.  In the **MySQL Configuration Data** section, specify details of the MySQL database:

    ■  In the **MySQL Hostname** box, type the fully qualified domain name of the system where you installed MySQL.

    ■  In the **MySQL Port** box, type the port that is configured to work with MySQL (default: 3306).

    ■  In the **Database Name** box, type the name of the newly created database, that is, `nnminet`. (This is the database that you created in "Installing and Configuring MySQL" on page 10.)

    ■  In the **Database User** box, type the name of the newly created database user, that is, `nnminet_user`. (This is the database that you created in "Installing and Configuring MySQL" on page 10.)

    ■  In the **Database User Password** box, type the password for `nnminet_user`.

8.  In the **NNMi Server Configuration Data** section, specify the details of the NNMi management server:

    ■  In the **Hostname or IP Address** box, type the fully qualified domain name (FQDN) or IP address of the NNMi management server.

    **Note:** If NNMi is installed in a high-availability cluster, you must type the virtual FQDN or IP address of the NNMi management server.

    ■  In the **HTTP Port** box, type the HTTP port of the NNMi management server.

    ■  In the **NNMi System Password** box, type the password for the NNMi system user.

    **Tip:** Note down the values you entered.

9.  Click **Start Install**. You can view the installation log file at any time during the installation by clicking the log file link in the lower-left corner of the installer window.

    The installer program performs the following tasks:

    ■  Installing the embedded HP OO Central server

    ■  Loading the NNM iSPI NET diagnostic flows

- Binding to the NNMi management server

These steps could take up to an hour to complete.

When the installation is complete, a completion message appears in the installer window.

> **Note:** By default, the embedded HP OO Central user interface opens when you click **Finish**. To skip this launch, clear the **Launch HP OO** check box.

10. Click **Finish** to close the installer window.

    If you chose to launch the embedded HP OO Central user interface, your browser opens.

    You might see an invalid SSL certificate message because the installer includes, by default, a self-signed certificate that serves as a placeholder for a valid customer-obtained certificate. You can safely ignore this warning.

11. After successful installation, follow these steps to add necessary stored procedure to your MySQL database:

    a. Run the `sp_reset_run_id.sql` script located under the *<media_root>*/Upgrade_ 9.07.0005/resources directory (on the NNM iSPI NET installation DVD) by using the following command:

       **>mysql -u nnminet_user -p nnminet < sp_reset_run_id.sql**

    b. Modify the `init.sql` file to use the HP OO database schema name.

    c. Copy the `init.sql` file to the installation directory of MySQL (for example, `C:\Program Files\MySQL\MySQL Server 5.1`).

    d. Add the `init-file` option to the *<MySQL_Install_Dir>*/my.ini file. For example, modify the `C:\Program Files\MySQL\MySQL Server 5.1\my.ini` file and add the following line:

       `init-file="C:\Program Files\MySQL\MySQL Server 5.1\init.sql"`

       In this instance, *<MySQL_Install_Dir>* is the installation directory of MySQL.

    e. Restart MySQL.

## *Installing the NNM iSPI NET on an Existing HP OO System*

To install the NNM iSPI NET on a pre-existing HP OO Central server, follow these steps:

> **Note:** When you use an already installed HP OO, it is not mandatory to configure HP OO to use only MySQL. You can use an external, fully functional HP OO configured with any supported database. You must, however, make sure that SSL certificate files are already created (see "Creating New SSL Certificate Files on an Existing HP OO Central Server" on

).

Also, make sure that OO Content Pack is installed on the HP OO Central server.

1. Log on as administrator or root to the HP OO Central server.

2. Insert the NNM iSPI NET installation DVD into the DVD-ROM drive, or download the electronic installation media.

3. In the root directory of the installation media, start the installer:

   - If the HP OO Central server is running on a 32-bit operating system, double-click the `setup.exe` file.

   - If the HP OO Central server is running on a 64-bit operating system, double-click the `setup_x64.exe` file

   The installer Welcome window lists the installation steps.

   **Note:** Because HP OO Central is already installed on this system, check marks indicate the installation steps that have already been completed.

4. Click **Next**, and then accept the license agreement.

   The Configuration Parameters screen appears.

5. Review the fields provided on the Configuration Parameters screen.

6. Do the following:

   - Verify the HP OO Central HTTP and HTTPS ports, and change them if necessary.

     **Note:** Communication between the embedded HP OO Central web application and the HP OO Central web client is over secure connections, using the HTTPS protocol. The HTTP port makes it possible for client users to type an HTTP protocol address in the browser and be redirected to the secure connection.

   - In the **Admin Password** box, type the password for the HP OO Central admin user.

   - In the **Hostname or IP Address** box, type the fully qualified domain name (FQDN) or IP address of the NNMi management server.

     **Note:** If NNMi is installed in a high-availability cluster, you must type the virtual FQDN or IP address of the NNMi management server.

- In the **HTTP Port** box, type the HTTP port of the NNMi management server.

- In the **NNMi System Password** box, type the password for the NNMi system user.

> **Tip:** Note down the values you entered.

7. Click **Start Install**. You can view the installation log file at any time during the installation by clicking the log file link in the lower-left corner of the installer window.

   The installer program performs the following tasks:

   - Loading the NNM iSPI NET diagnostic flows

   - Binding to the NNMi management server

   When the installation is complete, a completion message appears in the installer window.

   > **Note:** By default, the HP OO Central user interface opens when you click **Finish**. To skip this launch, clear the **Launch HP OO** check box.

8. Click **Finish** to close the installer window.

9. After successful installation, follow these steps to add necessary stored procedure to your MySQL database:

   a. Run the `sp_reset_run_id.sql` script located under the *<media_root>*/`Upgrade_9.07.0005/resources` directory (on the NNM iSPI NET installation DVD) by using the following command:

      **mysql -u nnminet_user -p nnminet < sp_reset_run_id.sql**

   b. Modify the `init.sql` file to use the HP OO database schema name.

   c. Copy the `init.sql` file to the installation directory of MySQL (for example, `C:\Program Files\MySQL\MySQL Server 5.1`).

   d. Add the `init-file` option to the *<MySQL_Install_Dir>*/`my.ini` file. For example, modify the `C:\Program Files\MySQL\MySQL Server 5.1\my.ini` file and add the following line:

      `init-file="C:\Program Files\MySQL\MySQL Server 5.1\init.sql"`

      In this instance, *<MySQL_Install_Dir>* is the installation directory of MySQL.

   e. Restart MySQL.

## Post-Installation Tasks

*Skip this section if you want to use the HP OO Central that is embedded with the NNM iSPI NET media.*

After the installation is complete, follow these steps:

1. Go to the `hotfix` directory on the installation media, and then run the `hotfix.bat` file.

2. Go to the following directory on the HP OO Central server:

   `%ICONCLUDE_HOME%\Central\conf`

3. Open the `Central.properties` file with a text editor.

4. In the `Central.properties`file, set the `dharma.antisamy.default.policy` property to `anythinggoes.xml`.

   (By default, the property is set to `slashdot.xml`.)

5. Save the file.

6. Restart OO services.

   To restart the services, follow these steps:

   a. Log on to the HP OO Central server.

   b. In the Services window, restart the following services:

      i. RSCentral

      ii. RSJRAS

      iii. *(Not available on HP OO 9.07 or higher)* RSScheduler

## Creating Users on the Diagnostics Server

To view results from NNM iSPI NET diagnostic flows, NNMi users must open pages on the server where the diagnostic flows are installed. To do so, these users need user accounts on the diagnostics server.

If you installed the diagnostic flows on a pre-existing HP OO Central server, work with the HP OO Central systems administrator to set up HP OO user accounts.

If you are using the embedded NNM iSPI NET diagnostics server, you should set up user accounts for NNMi users on the diagnostics server. For ease of use, set up the user names and passwords to match pre-existing NNMi user accounts. This best practice makes it easier to update accounts for future releases of NNM iSPI NET.

To set up user accounts on the diagnostics server:

1. Open the diagnostics server log-on page by entering the following URL into a web browser window:

   http://*<hostname>:<port>*/PAS/

   Where *<hostname>* is the name of the diagnostics server and *<port>* is the port that you specified for the embedded HP OO Central during server installation

2. Log on as `admin` using the password you specified during installation.

3. On the Administration tab, click **Manage Users**.

4. For each user account, do the following:

   a. Click **Add New User**.

   b. Enter a user account name.

   c. Select the **Internal Account** check box. If you plan to use single sign-on with NNMi as the first point of entry, select the **External Account** check box.

   d. Enter the account password in the `User Password` and `Verify Password` fields.

   e. Click **Create User**.

For more information about HP OO Central users, capabilities, and permissions, see the *Users, groups, and access control* section of the HP OO Central help.

# License NNM iSPI NET

When you install NNMi, the NNM iSPI NET functionality is enabled with a temporary Instant-On license key. Purchase a permanent NNM iSPI NET license separately from your permanent NNMi license. You should obtain and install a permanent license key as soon as possible.

## *Checking the License Type*

To determine the type of license that NNM iSPI NET is using, in the NNMi console, click **Help > System Information**. In the System Information window, click **View Licensing Information**.

## *Obtaining and Installing a Permanent License Key*

To obtain and install a permanent license key for NNM iSPI NET on the NNMi system, use the NNMi `nnmlicense.ovpl` tool.

Before requesting a permanent license key, gather the following information:

- The Entitlement Certificate, which contains the HP product number and order number for NNM iSPI NET

- The IP address of the NNMi management server

- Your company or organization information

After gathering the necessary information, complete one of the following processes for obtaining and installing an NNM iSPI NET license key.

### *Automated Process*

For automated assistance with the NNM iSPI NET license key, follow these steps:

1. At a command prompt on the NNMi management server, enter the following:

   ```
   nnmlicense.ovpl iSPI-NET -g
   ```

   > **Note:** The product license ID (`iSPI-NET`) is case-sensitive.

2. In the License Password dialog box, click **Request License**.

3. Follow the instructions on the screen to obtain the permanent license key.

### *Manual Process*

If the automated process does not run to completion (for example, if the NNMi management server is behind a firewall), follow these steps:

1. To obtain a license key, go to the HP password delivery service at

   **https://webware.hp.com/welcome.asp**

2. At a command prompt on the NNMi management server, enter the following command to update the system and to store license data files:

   ```
   nnmlicense.ovpl iSPI-NET -f <license_file>
   ```

   > **Note:** The product license ID (`iSPI-NET`) is case-sensitive.

   See the *nnmlicense.ovpl* reference page, or the UNIX manpage, for more information.

## Obtaining Additional License Keys

Contact your HP Sales Representative or your Authorized Hewlett-Packard Reseller for information about the NNMi and NNM iSPI NET licensing structure and to learn how to add license tiers for enterprise installations.

To obtain additional license keys, go to the HP password delivery service:

**https://webware.hp.com/welcome.asp**

## Disabling NNMi Triggering of Diagnostic Flows

You might want to disable NNMi triggering of diagnostic flows without removing the server running those flows.

### *Disabling Diagnostic Flows*

To stop NNMi from automatically triggering the diagnostic flows, follow these steps:

1. Log on as an administrator to the NNMi management server.

2. In a command window, navigate to the support directory:

   *Windows*: *<drive>*:\Program Files\HP\HP BTO Software\support\

   *UNIX®*:/opt/OV/support/

3. Run the `nnmdiagnostics.ovpl` command with the `uninstall` option:

   `nnmdiagnostics.ovpl uninstall`

   The `nnmdiagnostics.ovpl` command can also do the following:

   ▪ Determine the current HP OO Central server configuration:

   `nnmdiagnostics.ovpl servers`

   ▪ Change the password NNMi uses for the admin account on the HP OO Central server

   `nnmdiagnostics.ovpl credentials`

   If the `admin` account password changes on the HP OO Central server (whether the embedded diagnostics server or an existing HP OO Central server), NNMi needs to be informed of the change. Use `nnmdiagnostics.ovpl` credentials to provide NNMi with the new password.

## *Re-Enabling Diagnostic Flows*

You can re-enable the triggering of the diagnostic flows by running the installer on the diagnostics server or on the HP OO Central server. For more information, see one of the following:

- "Installing the NNM iSPI NET with the Embedded HP OO" on page 15.

- "Installing the NNM iSPI NET on an Existing HP OO System" on page 18.

The installer detects that the needed software is already installed and performs the configuration steps.

# Using Single Sign-on with NNM iSPI NET

If you plan to use single sign-on between NNMi and HP OO or the embedded NNM iSPI NET diagnostics server, see the following documents:

The *Enabling single sign-on for OO Central* section of the *Operations Orchestration Administrator's Guide*

The *Using Single Sign-On with NNMi* chapter of the *NNMi 9.10 Deployment Reference*.

# Chapter 4: About NNM iSPI NET Components

This chapter provides information to help you begin using the NNM iSPI NET tools.

## NNM iSPI NET Diagnostics

NNM iSPI NET diagnostic flows are sets of automated commands specific to one or more device types. You associate these flows with incident configurations, including the associated node group and lifecycle state.

NNMi automatically triggers the configured flows when an incident changes to the specified lifecycle state. Links to the diagnostic flow results appear on the Diagnostics tab of the Incident form. Flow results can help you troubleshoot the problem on the source node.

Examples of the kinds of diagnostics that NNM iSPI NET provides include the following:

- Determine the current configuration of a Cisco router, Cisco switch, or Nortel switch.

- Perform diagnostic checks on a specified interface on a Cisco router.

- Obtain routing information using the `show ip route` command.

- Determine failures of tracing the route to a target node.

- Determine statistics for a specified port on a Nortel switch.

For information about the available diagnostics, see *Diagnostics (Flows) Provided by NNM iSPI NET* in the NNMi help.

## *Configuring NNM iSPI NET Diagnostics*

To configure NNM iSPI NET to automatically gather diagnostic information about the source node whenever an incident reaches a specific lifecycle state, follow these steps:

1. Sign in to the NNMi console as an NNMi Administrator.

2. Open an incident configuration.

3. On the Node Settings tab, click **New**.

4. On the Node Settings form, do the following:

   - Specify the node group for which you want to automatically gather diagnostic information.

   - On the Diagnostic Selections tab, specify the flow NNMi should run on each applicable source node in the node group for the incident you are configuring.

   - For each flow, specify the appropriate incident lifecycle state.

For more information, see *Configure Diagnostics for an Incident* in the NNMi help.

## *Using NNM iSPI NET Diagnostics*

After you configure a diagnostic for the incident and node group, the following criteria must be met before the diagnostic can run:

- The source node must be in the node group you have selected.

- The diagnostic must be valid for the source node. (For example, only Nortel switch diagnostics are run on Nortel switches.)

- The incident's current lifecycle state must match a lifecycle state for which it was configured. (For example, if you configure the incident to run a specified diagnostic when the incident is closed, if the current incident's lifecycle state changes to Closed, NNMi runs that diagnostic.)

- Device credentials for the source node must be set up in NNMi. See "NNMi Management Server Preparation" on page 9.

If these criteria are met, NNM iSPI NET runs the diagnostics and generates diagnostic reports to help you solve the problem on the source node.

> **Note:** If NNMi has incorrect device credentials for the source node, the diagnostic report shows a device communication problem rather than the results of the diagnostic flow.

You can run diagnostics on demand, using **Actions** > **Run Diagnostics** from the associated Node form. In this way, you can gather baseline information for a device before any problems occur. You can also use **Actions** > **Run Diagnostics** from an Incident form.

In addition, NNM iSPI NET associates diagnostics with the node on which the diagnostic was run. To view the diagnostics automatically invoked for the node, open the Node form for any node of interest.

For information about diagnostic results, see *Incident Diagnostic Results Form (Flow Run Result)* and *Node Diagnostic Results Form (Flow Run Result)* in the NNMi help.

# Custom HP OO Flow Management

If you have the full HP OO product, you can import HP OO flow definitions into NNMi and then assign these flows to run when NNMi detects certain network incidents.

The process for importing an HP OO flow definition into NNMi is as follows:

1. In HP OO Studio, build and test the flow.

   Depending on the incident type, NNMi can pass any or all of the following data types to the flow:

   - Device credentials (user name and password)

   - Device hostname

- Interface name

- Interface type

- Interface alias

- Interface index

- Port name

- Port index

2. Create a flow definition file that describes the HP OO flow to NNMi.

   For information about the syntax of this file, see the *nnmooflow.ovpl* reference page, or the UNIX manpage.

3. Run the `nnmooflow.ovpl -i` command to import the HP OO flow definition.

4. Assign the HP OO flow definition to an incident configuration for a specific node group as described in "Configuring NNM iSPI NET Diagnostics" on page 25.

The `nnmooflow.ovpl` command provides the following functionality:

- List the available flows (HP-provided diagnostic flows and custom HP OO flow definitions).

- Import custom HP OO flow definitions.

- Delete custom HP OO flow definitions that are not currently assigned to any incident configuration.

For more information, see the *nnmooflow.ovpl* reference page, or the UNIX manpage.

# NNM iSPI NET SNMP Trap Analytics

By default, NNMi measures the rate of incoming traps, including the following:

- The rate of incoming SNMP traps from each device

- The rate of each incoming trap for each trap object identifier (OID)

NNMi monitors this trap information to determine whether any incoming traps exceed the configured rate threshold. If a threshold is exceeded, NNMi blocks the traps from the device (or for the specific trap OID) until the trap rate falls below the minimum rearm value. The NNMi administrator can configure the threshold and rearm values with the `nnmtrapconfig.ovpl` command. For more information, see the *nnmtrapconfig.ovpl* reference page, or the UNIX manpage.

NNM iSPI NET SNMP Trap Analytics provides reports about this trap information according to the following criteria:

- Within a specific time period

- For a specific node

- According to a specific trap identifier (trap OID)

When analyzing traps, NNMi looks at both the most common traps, as well as the most common source nodes from which the traps are received. This SNMP trap analytics data is logged to the `trapanalytics.0.0.log` file.

Information in the log file is organized as follows for specific time intervals:

- Trap rate in number of traps per second

- The top 10 addresses that are generating traps

- The top 10 traps that are being generated

In the NNMi console, you can access the `trapanalytics.0.0.log` file with **Tools > Trap Analytics > Trap Analysis Log**. For information about individual traps that arrived in the time window mentioned in the analytics report, use the `nnmtrapdump.ovpl` command. For more information, including details on the `trapanalytics.0.0.log` file and its location, see the *nnmtrapdump.ovpl* reference page, or the UNIX manpage.

The **Tools > Trap Analytics** menu in the NNMi console provides access to trap analytics reports. From a report window, you can start graphs of the trap rate for one or more nodes or trap OIDs.

For more information about the NNM iSPI NET SNMP Trap Analytics reports, see *Analyze Trap Information* in the NNMi help.

# NNM iSPI NET Visio Export Functionality

You can export the information from one or more NNMi topology maps to an XML formatted (`.vdx`) file that Visio can read. For example, you might want to export the Network Overview topology map before a major change to your network infrastructure. You can open this file in Visio, and you can share the file with people who do not use NNMi.

The **Tools > Visio Export > Current Map** command creates a Visio file containing one sheet that shows the topology of the map from which you invoke the command.

The **Tools > Visio Export > Saved Node Group Maps** command creates a Visio file containing one sheet per node group map. To include a node group map in this larger file, select the **Include in Visio Export** check box on the Node Group Map Settings form for the node group.

For more information about the Visio export functionality, including how you can modify and print the file within Visio, see *Export Maps to Microsoft Visio* in the NNMi help.

# Chapter 5: Maintaining the NNM iSPI NET Diagnostics Server

If you are running the NNM iSPI NET diagnostics server, not the full HP Operations Orchestration (HP OO) product, read this chapter for information to help you maintain the embedded NNM iSPI NET diagnostics server.

## Back up the Diagnostics Server Database

The NNM iSPI NET diagnostics server includes the MySQL database, which includes the `mysqldump.exe` command for backing up the contents of the database.

" Figure 1 Example MySQL Backup Script" below shows an example script for backing up the diagnostics server database with the `mysqldump.exe` command. In this example, make the following substitutions:

- Set the `DATABASE` variable to the database name specified during installation of the diagnostics sever.

- Set the `ROOTUSER_PASSWORD` variable to be the password of the MySQL database entered during installation of the diagnostics server.

Example MySQL Backup Script

**Figure 1 Example MySQL Backup Script**

```
@Echo Off
@For /F "tokens=1,2,3,4 delims=/ " %%A in ('Date /t') do @(
Set All=%%A%%B%%C%%D
)

@For /F "tokens=1,2,3 delims=: " %%A in ('Time /t') do @(
Set All=%ALL%_%%A_%%B_%%C
)

Set DATABASE=nnmi
Set ROOTUSER=root
Set ROOTUSER_PASSWORD=admin

REM NNM iSPI-NET 9.20

"C:\Program Files\MySQL\MySQL Server 5.1\bin\mysqldump.exe" -u%ROOTUSER%
-p%ROOTUSER_PASSWORD% --lock-tables --databases %DATABASE% >
nnminet_db_backup_%All%
```

**Note:** The example shown in " Figure 1 Example MySQL Backup Script" above applies to NNM iSPI NET version 9.10. For earlier versions of NNM iSPI NET, the `mysqldump.exe` command is in the `<Drive>:\Program Files (x86)\MySql\MySql Server 5.0\bin` directory.

# Back up HP OO Configuration Files

Before changing the configuration of the NNM iSPI NET diagnostics server, back up the HP OO configuration files in the following directories:

- *<Drive>*:\Program Files\Hewlett-Packard\Operations Orchestration\Central\conf

- *<Drive>*:\Program Files\Hewlett-Packard\Operations Orchestration\\RAS\Java\Default\web app\conf

- *<Drive>*:\Program Files\Hewlett-Packard\Operations Orchestration\Scheduler\conf

# Chapter 6: Removing NNM iSPI NET

To remove the NNM iSPI NET software, do the following:

- "Task 1: Remove NNM iSPI NET References from the NNMi Console" below

- "Task 2: Disable the Triggering of Diagnostic Flows" below

- "Task 3: Remove the Diagnostic Flows and Server" on the next page

## Task 1: Remove NNM iSPI NET References from the NNMi Console

If NNM iSPI NET is unlicensed, you can remove references to it from the NNMi console; follow these steps:

1. Sign in to the NNMi console as an NNMi Administrator.

2. From the workspaces navigation panel, select the **Configuration** workspace.

3. Expand **User Interface**.

4. Select **User Interface Configuration**.

5. Clear the **Show Unlicensed Features** check box

6. Click **Save and Close**.

> **Note:** The steps in this task remove all menu items, views and workspaces for any unlicensed function, including NNMi Advanced and other NNM iSPIs if they are also unlicensed.

To remove an NNM iSPI NET license key (making NNM iSPI NET unlicensed), follow these steps:

1. At a command prompt on the NNMi management server, enter the following:

   `nnmlicense.ovpl iSPI-NET -g`

   > **Note:** The product license ID (`iSPI-NET`) is case-sensitive.

2. In the License Password dialog box, click **Remove License Key**.

## Task 2: Disable the Triggering of Diagnostic Flows

To disable the running of diagnostic flows triggered by NNMi incidents, follow these steps:

1. Log on as an administrator to the NNMi management server.

2. In a command window, navigate to the support directory:

   *Windows*: *<drive>*:\Program Files\HP\HP BTO Software\support\

   *UNIX*:/opt/OV/support/

3. Run the `nnmdiagnostics.ovpl` command with the `uninstall` option:

   `nnmdiagnostics.ovpl uninstall`

# Task 3: Remove the Diagnostic Flows and Server

You can either install the NNM iSPI NET with the HP OO Central that is embedded with the NNM iSPI NET media, or you can install only the diagnostic flows on an existing HP OO Central that was previously installed in your environment.

To uninstall an NNM iSPI NET instance with an embedded HP OO Central, follow these steps:

1. Make sure that all HP OO Central users log off.

2. Remove the embedded diagnostics server as follows:

   a. Log on as an administrator or root to the system where the diagnostics server is installed.

   b. Stop the services of the embedded HP OO Central: RSCentral and RSJRAS.

   c. Mount the *NNM iSPI NET 9.10* media.

   d. Run one of the following programs from the media root:

      ○ For Windows 32-bit systems: `setup.exe`

      ○ For Windows 64-bit systems: `setup_x64.exe`

   e. Follow the on-screen instructions.

   f. Remove the directories where HP OO Central was installed.

   If you installed only diagnostic flows on an already existing OO Central, use the OO Studio to remove the diagnostic flows.

# Appendix A: Troubleshooting Installation and Runtime Problems

## Diagnostics Server Installation Problems

If you encounter errors during installation of the NNM iSPI NET diagnostics server, the error first appears in an error message window. After you close the message window, the installer Welcome window displays the error message in the text box. The NNM iSPI NET diagnostics server installer logs all error messages to the installation log.

The installation log is named `nnm-ispi-net-server-installer.log`. This file is created in the temporary files directory (as set with the `%TEMP%` environment variable) for the user doing the install.

You can restart the installation without having to close the installer window. If you click **Start Over** to restart the installation, the Configuration Parameters dialog is populated with the values you specified previously. This restart can be helpful if you have specified an incorrect user name or password for one of the components, or an HTTP or HTTPS port that is already in use. You can leave all other parameters as originally specified and change only the problem parameter. If you exit the installer and then run it, you need to type the configuration parameters again. However, be aware that these configuration parameters do not persist after you exit the installer.

**Problem: Diagnostics server installation subprocesses do not terminate immediately when installation is canceled**

**Solution**:

If you click **Quit** in the main server installer window, the `.NET` and HP OO installation subprocesses run to completion after they are initiated as part of the install.

**Problem: Cannot create database or add user during MySQL configuration**

**Solution**:

If you are using the embedded HP OO Central diagnostics server:

- During MySQL configuration, you might have specified a different password for the MySQL root account than the password specified in the NNM iSPI NET diagnostics server installer Configuration Parameters window. To verify the password for the MySQL root account:

  - Verify that you have the correct root user name and password.Change these values in the Configuration Parameters window, if necessary.

  - If the existing MySQL database is on a remote system, verify that you can log on remotely to the root user account. If necessary, enable remote logon for the duration of the MySQL configuration step.

  - Verify that your database and database user names do not conflict with names already in use on this MySQL server. Change these values in the Configuration Parameters window, if necessary.

After you have corrected any problems, click **Start Over** in the diagnostics server installer to try the MySQL configuration step again.

**Problem: Diagnostics server installer reports an NNMi binding failure**

This problem can occur if you incorrectly specify one or more of the NNMi fields in the Configuration Parameters step of NNM iSPI NET diagnostics server installation.

**Solution**:

To check that you have the correct values in these fields:

- Open a browser and navigate to http://<*hostname*> where <*hostname*> is the value you specified during installation for the NNMi Hostname or IP Address and <*port*> is the value you specified during installation for the NNMi HTTP Port.

- Sign in to NNMi as the system user using the password you specified during installation for the NNMi Administrative Password.

After you have verified the NNMi management server's hostname, port, and system user password, either click **Start Over** in the NNM iSPI NET diagnostics server installer or run the installer again.

If you are using an existing HP OO Central server, verify that you have created the required certificate files as described under See "Creating New SSL Certificate Files on an Existing HP OO Central Server" on page 11.

# Diagnostic Flows Runtime Problems

Messages related to the running of diagnostic flows are logged to the `nnm.0.0 log` (and older) files on the NNMi management server. If you encounter diagnostic submittal problems on the NNMi management server, check these log files for SEVERE and WARNING messages for the classes beginning with the string `com.hp.ov.nms.rba.`

The `nnm.0.0 log` file is in the following location:

- Windows Server 2008:

    `C:\ProgramData\HP\HP BTO Software\log\nnm.log#`

- UNIX:

    `/var/opt/OV/log/nnm/nnm.log#`

For more information about NNMi logging, including the versioning of log files, see the *logging.properties* reference page, or the UNIX manpage.

**Problem: Diagnostic flows are listed as "Not Submitted"**

If the flows displayed on the Diagnostics tab of a Node or Incident form are classified as "Not Submitted," NNMi might be unable to find device credentials for the target node, or the HP OO Central SSL certificates might be incorrect.

**Solution**:

Check the `nnm.0.0.log` file (or an older log file) on the NNMi management server for SEVERE or WARNING messages from the same time frame as the failing flows.

If the error messages indicate that a password or logon information is missing, use the Communication Configuration form in the Configuration workspace of the NNMi console to create Default Device Credentials. Then use Regions and Specific Node Settings to provide any device credentials that differ from the defaults.

If the error messages indicate a missing hostname or other communication issue with the HP OO Central server, verify that the SSL certificates have been set up on the HP OO Central server as described in "Creating New SSL Certificate Files on an Existing HP OO Central Server" on page 11.

**Problem: Diagnostic flow results report a communication problem with the device**

This problem indicates that NNMi has the wrong device credentials for this device.

**Solution**:

Telnet or ssh to the device to check whether the device credentials are correct.

After you have verified that you have the correct username and password, correct or add the appropriate setting using the Default Device Credentials, Regions, or Specific Node Settings tab on the Communication Configuration form in the NNMi console Configuration workspace.

**Problem: NNMi reports 0 diagnostic flows submitted**

This problem indicates that you have attempted to run a diagnostic flow for a device that has no associated flows.

**Solution**:

Only certain types of devices have associated diagnostic flows. See the *NNM iSPI NET Diagnostics Server System and Device Support Matrix* for details about supported devices.

**Problem: NNMi does not use credentials supplied in Specific Node Settings**

If the Target Hostname field of the Specific Node Settings form does not exactly match the value of the node hostname attribute in the NNMi inventory, NNMi might not find the correct credentials for the device.

**Solution**:

If NNMi found a fully-qualified domain name for a node during discovery, this name must be used to identify the node in Specific Node Settings. For example, suppose NNMi discovery processes have identified the node by its fully qualified domain name:

`rtr17.bldg3.example.com`

You cannot use `rtr17` or an `IP address` to identify the node in Specific Node Settings. You must use `rtr17.bldg3.example.com`. An IP address can be used only if NNMi does not have a fully-qualified domain name for the node.

To determine how NNMi has identified a node, open a Node form for the node from a topology map or a table view. The Hostname value in the Node form contains a fully qualified domain name or an IP address, depending on what NNMi found during discovery. Use the value from the  Hostname field to identify the node in Specific Node Settings.

# Visio Export Functionality Problems

Messages related to Visio export are logged to the `nnm.0.0.log` (and older) files on the NNMi management server. If you experience problems with exporting maps to Visio, check these log files for SEVERE and WARNING messages for the following classes:

- `com.hp.ov.nms.ui.visio.*`

- `com.hp.ov.nms.ui.framework.web.servlets.VisioViewSerlvet`

The `nnm.0.0.log` file is in the following location:

- Windows Server 2008:

  `C:\ProgramData\HP\HP BTO Software\log\nnm\nnm.%g.%u.log`

- Windows Server 2003:

  `C:\Documents and Settings\All Users\Application Data\HP\HP BTO Software\log\nnm\nnm.%g.%u.log`

- UNIX:

  `/var/opt/OV/log/nnm/nnm.%g.%u.log`

For more information about NNMi logging, including the versioning of log files, see the *logging.properties* reference page, or the UNIX manpage.

**Problem: Cannot open the Visio file directly from NNMi**

If the File Download window does not include the Open button, Visio is not installed on the computer where the NNMi console is running.

**Solution**:

Install the correct version of Visio (as described in the *NNMi System and Device Support Matrix*) on the computer running the NNMi console. Alternatively, you can save the file to the NNMi management server and then move it to a different computer where the correct version of Visio is installed.

**Problem: Visio file does not open correctly**

The Visio installation might be an incorrect version or might be corrupted.

**Solution**:

Install the correct version of Visio (as described in the *NNMi System and Device Support Matrix*).

**Problem: Node group map not exported with Saved Node Group Maps command**

The node group might not be configured correctly.

**Solution**:

For each node group map you want to export with the Saved Node Group Maps command, verify that the **Include in Visio Export** check box is selected on the Node Group Map Settings form

**Problem: Export is very slow**

Each node on a map increases the export time.

**Solution**:

On the Node Group Map Settings form, reduce the values of the Maximum Number of Displayed Nodes and Maximum Number of Displayed End Points attributes.

**Problem: Export file is too large**

All information in the export increases the file size.

**Solution**:

In the Visio Map Export window, clear the **Include connection labels** check box. This configuration limits the amount of data exported for each connection, which results in a smaller file size.

**Problem: No download window**

One or both of the Visio Map Export and File Download windows do not open

**Solution**:

Check the `nnm.0.0.log` file (or an older log file) on the NNMi management server for SEVERE or WARNING messages.

**Problem: Visio Export menu not enabled or gives Access Denied message**

By default, the Visio export functionality requires that you sign in as an NNMi Operator 2 or Administrator.

**Solution**:

Ask the NNMi administrator to add you to the Operator 2 user group.

# nnmooflow.ovpl Command Problems

Messages regarding the `nnmooflow.ovpl` command are logged to the `nnm.0.0.log` (and older) files on the NNMi management server. If the `nnmooflow.ovpl` command generates an error message, check these log files for SEVERE and WARNING messages for the classes beginning with the string `com.hp.ov.nms.rba.`

The `nnm.0.0.log` file is in the following location:

- Windows Server 2008:

  `C:\ProgramData\HP\HP BTO Software\log\nnm\nnm.%g.%u.log`

- UNIX:

  `/var/opt/OV/log/nnm/nnm.%g.%u.log`

For more information about NNMi logging, including the versioning of log files, see the *logging.properties* reference page, or the UNIX manpage.

# Part 2: HP Network Node Manager iSPI Network Engineering Toolset Software (March 2011)

This part of the book provides the instructions to install the NNM iSPI Network Engineering Toolset Software 9.10 released in March, 2011.

For instructions to install the NNM iSPI Network Engineering Toolset Software 9.10 released in February 2014, see Part 1.

# Chapter 1: Introducing HP NNM iSPI Network Engineering Toolset Software

The HP NNM iSPI Network Engineering Toolset Software (NNM iSPI NET) extends the powerful network management capabilities of NNMi by providing additional troubleshooting and diagnostic tools for network engineers. Purchasing NNM iSPI NET provides the following functionality:

- NNM iSPI NET functionality in the NNMi console (enabled with an NNM iSPI NET license):

  - SNMP trap analytics provide summary and detailed information about SNMP trap traffic in the network.

  - Visio export functionality exports NNMi topology map data to Microsoft® Visio files.

  - If the HP Network Automation integration with NNMi is enabled, the **Show mismatched connections** menu item displays a table of all layer 2 connections with possible speed or duplex configuration differences. For more information, see the "HP Network Automation" chapter in NNMi Deployment Reference.

    **Note:** For information about the supported hardware, operating systems, and web browsers for the NNMi console as well as information about the supported versions of Visio, see the NNMi System and Device Support Matrix.

- NNM iSPI NET diagnostic flows and diagnostics server, which must be installed separately from NNMi (on the NNMi management server or on a separate computer):

  - The HP-provided diagnostic flows automatically gather diagnostic information when NNMi detects certain network incidents.

  - The diagnostics server is an embedded packaging of HP Operations Orchestration (HP OO). If you already have the full HP OO product, you can install the NNM iSPI NET diagnostic flows on that server.

  - If you have the full HP OO product, you can also import HP OO flow definitions into NNMi and then assign these flows to run when NNMi detects certain network incidents.

    **Note:** For information about the supported hardware, operating systems, and web browsers for the embedded diagnostics server as well as information about the supported versions of the full HP OO product, see the NNM iSPI NET Diagnostics Server System and Device Support Matrix.

## How is NNM iSPI NET Installed?

The NNM iSPI NET SNMP trap analytics and Visio export functionality are automatically installed with NNMi. The diagnostic flows and diagnostics server must be installed from separate installation

media. See for details.

## How is NNM iSPI NET Licensed?

When you install NNMi, the NNM iSPI NET functionality is enabled with a temporary Instant-On license key. Purchase a permanent NNM iSPI NET license separately from your permanent NNMi license. See for details.

# Chapter 2: Preinstallation Checklists

This chapter contains checklists for the tasks that you must complete before installing NNM iSPI NET, including where to find information on supported hardware and software.

The NNM iSPI NET SNMP trap analytics and the Visio export functionality are automatically installed during NNMi installation. These features share the NNMi installation requirements, which are documented in the NNMi System and Device Support Matrix.

The NNM iSPI NET diagnostics are installed separately using the NNM iSPI NET installation media. For specific supported configurations, this installation can be on the same system as NNMi. The following section describes how you can determine the hardware and software prerequisites for the NNM iSPI NET diagnostics server.

## Supported Hardware and Software

Before installing the NNM iSPI NET diagnostics, read the information about supported hardware and software described in Table 1.

**Software and Hardware Preinstallation Checklist**

| Complete (y/n) | Documentation to Read |
| --- | --- |
|  | *HP NNM iSPI NET Release Notes* <br><br> • **Filename** = `releasenotes_en.html` <br><br> • **Media** = NNM iSPI NET installation DVD (root directory) |
|  | *NNM iSPI NET Diagnostics Server System and Device Support Matrix* <br><br> • **Filename** = `supportmatrix_en.html` <br><br> • **Media** = NNM iSPI NET installation DVD (root directory) |

**Note:** HP updates the NNM iSPI NET Diagnostics Server System and Device Support Matrix as new information becomes available. Before you begin to install the NNM iSPI NET diagnostics server, check for the most recent NNM iSPI NET support matrix at this web site:

 **http://h20230.www2.hp.com/selfsolve/manuals**

(You must have an HP Passport user ID to access this web site.)

## NNMi Management Server Preparation

In a diagnostic flow, the first step is to log on to the device. NNM iSPI NET uses the device credentials that NNMi stores. To specify credentials for a device, follow these steps:

1. Open the NNMi console.

2. Navigate to the **Configuration** workspace.

3. Select the **Communication Configuration** form.

4. Use the **Default Device Credentials** tab to create default device credentials.

5. If some devices have credentials that differ from the default settings, use the **Regions** and **Specific Node Settings** tabs to define those credentials.

> **Note:** Device credentials are only needed on devices for which diagnostic flows will be run. See the *NNM iSPI NET Diagnostics Server System and Device Support Matrix* for details about supported devices.

# Diagnostics Server System Preparation

The NNM iSPI NET diagnostics server includes an embedded version of HP Operations Orchestration (HP OO) Central with restricted capabilities. The NNM iSPI NET diagnostic flows can be run by this embedded diagnostics server or by an HP OO Central already installed in your environment.

If you plan to use the embedded NNM iSPI NET diagnostics server, you must identify a system in your environment on which to install the diagnostics server. You can install the embedded NNM iSPI NET diagnostics server on the same system as NNMi, *if* NNMi is installed on a system that has sufficient resources and is running the correct operating system version.

If a supported version of the full HP OO product is already running in your environment, you can install the NNM iSPI NET diagnostics flows onto the existing HP OO Central server, or you can install the complete NNM iSPI NET diagnostics server onto a different system. Benefits of using the existing HP OO Central server include the following:

- Less hardware and system maintenance is required.

- All flows run on the same server, so users can access the information from HP OO and NNM iSPI NET flow runs in the same HP OO Central.

- You can import HP OO flow definitions into NNMi and then assign these flows to run when NNMi detects certain network incidents.

> **Note:** For information about the supported hardware, operating systems, and web browsers for the embedded diagnostics server as well as information about the supported versions of the full HP OO product, see the NNM iSPI NET Diagnostics Server System and Device Support Matrix.

**Diagnostics Server Preparation Checklist**

| Complete (y/n) | Diagnostics Server Preparation |
|---|---|
| | If you plan to use the embedded NNM iSPI NET diagnostics server, identify unused ports that can be assigned as the HTTP and HTTPS port numbers for the diagnostics server. Typical values include the following:<br><br>• 80 or 8080 for HTTP (default is 8080)<br><br>• 443 or 8443 for HTTPS (default is 8443) |
| | If you plan to use an HP OO Central already installed in your environment, gather the following information:<br><br>• The HTTP and HTTPS port numbers used by HP OO Central<br><br>• The password for HP OO Central admin user |
| | If you plan to use an HP OO Central already installed in your environment, you must create new certificate files so the installer can install diagnostic flows. See Creating Certificate Files on an Existing HP OO Central Server on page 14. |
| | The NNM iSPI NET diagnostics server requires MySQL. The NNM iSPI NET diagnostics server installer installs and configures MySQL, if it is not already installed. Alternatively, during installation, you can specify an existing MySQL server to be used by the diagnostics server.<br><br>If you plan to install MySQL, make sure all prior MySQL program, configuration, and database files have been removed. These files are typically found under the paths similar to the following examples:<br><br>• `C:\Program Files\MySQL\MySQL Server 5.1\`<br><br>• `C:\Program Data\MySQL\MySQL Server 5.1\` |

| Complete (y/n) | Diagnostics Server Preparation |
|---|---|
|  | If you want the diagnostics server to use an existing MySQL server instead of installing MySQL, gather the following information:<br><br>• The hostname or IP address of the existing MySQL server<br><br>• The MySQL database `root` user name and password (so that the installer can create the needed database)<br><br>• A database name for the diagnostics server MySQL database (for example, `nnmnet`; this database cannot already exist—it will be created during the installation)<br><br>• A database user name and password for accessing the MySQL database on the diagnostics server (for example, `nnmnet_user`).<br><br>If the existing MySQL server is installed on a separate system from the NNM iSPI NET diagnostics server, the MySQL server must permit remote access for the database `root` user. |
|  | Gather the following NNMi information:<br><br>• The hostname or IP address of the NNMi management server<br><br>• The HTTP port of the NNMi management server<br><br>• The password for the NNMi system user |
|  | The NNM iSPI NET diagnostics server installer requires an HTTP connection to the NNMi management server. Verify that this access is available. |

| Complete (y/n) | Diagnostics Server Preparation |
|---|---|
| | Verify that the diagnostics server system and the NNMi management server agree on the hostname of the diagnostics server system. The installer uses the hostname of the diagnostics server system when generating an SSL certificate. This certificate is used to secure communication between the diagnostics server and NNMi. The hostname in the SSL certificate must match the hostname that NNMi uses for the diagnostic server system. <br><br> If you are not sure that NNMi can identify this hostname as the diagnostic server hostname, follow these steps: <br><br> 1. Log on to the NNMi management server. <br><br> 2. Ping the diagnostics server using its hostname: <br><br>     ■ If the ping succeeds and matches the IP address of the diagnostics server system, you have a match. <br><br>     ■ If the ping fails or has the wrong IP address, you must find a hostname for the diagnostics server system that is recognized by both the NNMi management server and the diagnostics server. |
| | Install and enable a supported web browser if one is not already installed. For details, see the *NNM iSPI NET Diagnostics Server System and Device Support Matrix*. |

# *Creating Certificate Files on an Existing HP OO Central Server*

If you plan to use an existing HP OO Central server for NNM iSPI NET diagnostic flows, you must create an SSL certificate file for the NNM iSPI NET diagnostics server installer. The installer looks for this file in a specific location. You must create the file before installing the NNM iSPI NET diagnostic flows.

The NNMi SSL communication stack enforces hostname verification. However, HP OO Central does not include hostnames in its SSL certificates by default.

If you have not already done so, you must create an HP OO Central keystore entry that includes the hostname of the HP Central server. This entry is required for creating a valid certificate file for the installer.

> **Note:** The NNM iSPI NET embedded diagnostics server includes a hostname in its default SSL certificates. The information in this section only applies to existing HP OO Central servers. It does not apply to NNM iSPI NET embedded diagnostics servers.

NNMi communicates with the **RSCentral** HP OO Central service (also known as **PAS**). RSCentral communicates with two other HP OO Central services: **RSJRAS** (also known as **RAS**) and

**RSScheduler**. The HP OO Central server might also communicate with HP OO Studio and RAS clients. The trust relationships between these applications are managed through Java™ keystores.

The tasks in this section are as follows:

- "Set Environment Variables" below in a command window on the HP OO Central server. Complete the remaining tasks in this command window.

- "Back up the Keystore" on the next page before modification.

- "Check the SSL Certificate" on the next page to determine whether the current HP OO Central keystore entry contains a valid hostname.

- "Delete the Existing pas Alias from the Keystore" on page 48 in preparation for generating a new certificate with this alias.

- "Replace the Keystore Entry" on page 48 if it does not contain a valid hostname.

> **Note:** If you replace the current keystore entry, you must re-establish the trust relationships between the HP OO Central services and between HP OO Central and its clients.If you replace the current keystore entry, you must re-establish the trust relationships between the HP OO Central services and between HP OO Central and its clients.

- "Create the Certificate File" on page 48 used by the NNM iSPI NET diagnostics server installer.

**Set Environment Variables**

The example commands in this section use environment variables. Set these environment variables as follows:

1. Log on with administrator privileges to the HP OO Central server and open a command window.

2. HP OO Central sets the system environment variable `%ICONCLUDE_HOME%` to the HP OO Central installation directory. Use the following command to verify this variable's setting:

   **echo %ICONCLUDE_HOME%**

   The output should be similar to
   `C:\Program Files\Hewlett-Packard\Operations Orchestration`

3. Use the following commands to set `%JBIN_DIR%`, `%PAS_KEYSTORE%`, and `%HOSTNAME%`:

   **set JBIN_DIR=%ICONCLUDE_HOME%\jre1.6\bin**

   **set PAS_KEYSTORE=%ICONCLUDE_HOME%\Central\conf\ rc_keystore**

   **set HOSTNAME=**<server.example.com>

Use the current system hostname for **<server.example.com>**. This value must match the hostname that NNMi uses for the HP OO Central server.

> **Note:** If you are not sure that the NNMi management server can identify this hostname as the HP OO Central server hostname, follow these steps:
>
> a. Log on to the NNMi management server.
>
> b. Ping the HP OO Central server using its hostname:
>
> ○ If the ping succeeds and matches the IP address of the HP OO Central server, you have a match.
>
> ○ If the ping fails or has the wrong IP address, you must find a hostname for the HP OO Central server that is recognized by both the NNMi management server and the HP OO Central server.

**Back up the Keystore**

Back up the existing keystore by copying the file to another location, for example:

`copy "%PAS_KEYSTORE%" C:\temp\rc_keystore.b4NNMiSPINET`

**Check the SSL Certificate**

Check the HP OO Central keystore entries for a valid hostname as follows:

1. Enter the following Java *keytool* command:

   **"%JBIN_DIR%"\keytool -list -v -keystore "%PAS_KEYSTORE%" -storepass bran507025**

2. Look at the *Owner* and *Issuer* fields in the keystore entry of type *keyEntry*, for example:

   `Entry type: keyEntry`

   `Owner: CN=server.example.com, O=OO, C=SW`

   `Issuer: CN=server.example.com, O=OO, C=SW`

   - If the *keyEntry* does not include the hostname of the HP OO Central server, you must replace it. Continue with "Delete the Existing pas Alias from the Keystore" on the next page.

   - If the *keyEntry* includes the hostname of this HP OO Central server, you can use it to generate the `nnmgenpas.cer` certificate file for the installer. Continue with "Create the Certificate File" on the next page.

   > **Note:** The *keyEntry* hostname must match the hostname that NNMi uses for the HP OO Central server. If you are not sure that the NNMi management server can identify this hostname as the HP OO Central server hostname, see the command for

**Delete the Existing pas Alias from the Keystore**

Remove the existing pas alias, which a later step replaces. Enter the following Java *keytool* command:

```
"%JBIN_DIR%"\keytool -delete -alias pas -keypass bran507025 -keystore "%PAS_
KEYSTORE%" -storepass bran507025 >NUL
```

**Replace the Keystore Entry**

The NNMi SSL communication stack enforces hostname verification. However, HP OO Central does not include hostnames in its SSL certificates by default.

The *HP Operations Orchestration Software Administrator's Guide* describes how to replace the HP OO security certificate. Use the procedure in this guide to replace the *keyEntry* in %PAS_KEYSTORE% if it does not include the HP OO Central server's hostname.

Before proceeding with the certificate replacement steps, note the following:

- When you generate the new key pair for %PAS_KEYSTORE%, you must include a valid hostname in the *dname* parameter, for example:

```
"%JBIN_DIR%"\keytool -genkey -dname "CN=%HOSTNAME%, O=OO, C=SW" -alias pas -
keypass bran507025 -keystore "%PAS_KEYSTORE%" -storepass bran507025 -keyalg
"RSA" -validity 5475
```

- The hostname you specify must match the hostname that the NNMi management server uses for the HP OO Central server. See the command for setting %HOSTNAME% in "Use the following commands to set %JBIN_DIR%, %PAS_KEYSTORE%, and %HOSTNAME%:" on page 46.

- NNMi does not communicate directly with the HP OO RAS service, which means that you can leave the RAS *keyEntry* unchanged. However, you must complete the steps for importing the new PAS certificate into your RAS keystores.

- Signed certificates are more secure; however, your environment might not require signed certificates. HP OO Central and NNMi work with both signed and self-signed certificates. If your environment does not require signed certificates, skip the steps for obtaining signed HP OO certificates.

- The *HP Operations Orchestration Software Administrator's Guide* includes instructions for re-establishing trust relationships and mutual SSL authentication after keystore changes. Follow these instructions, and then verify that HP OO Central and its Studio and RAS clients can still communicate.

After replacing the *keyEntry* in %PAS_KEYSTORE%, you can create the certificate file for the NNM iSPI NET diagnostics server installer. Continue with "Create the Certificate File" below.

**Create the Certificate File**

After the HP OO Central keystore has a keyEntry that includes the server's hostname, create the certificate file for the NNM iSPI NET diagnostics server installer. You must create the certificate file using the location and name given in the example command. The NNM iSPI NET diagnostics server installer uses this path to find the certificate file.

Export the %PAS_KEYSTORE% entry to its certificate file by entering the following Java *keytool* command:

```
"%JBIN_DIR%"\keytool -exportcert -alias pas -file "%ICONCLUDE_
HOME%"\Central\conf\nnmgenpas.cer -keypass bran507025 -keystore "%PAS_KEYSTORE%"
-storepass bran507025
```

After completing this step, you can run the NNM iSPI NET diagnostics server installer. See .

For more information on HP OO Central SSL certificates, see the *HP Operations Orchestration Software Administrator's Guide*.

# Chapter 3: Installing the NNM iSPI NET Diagnostics Server and Diagnostic Flows

This chapter guides you through the process of installing and licensing NNM iSPI NET. The final section describes how to remove NNM iSPI NET from your system.

> **Note:** If an earlier version of NNM iSPI NET is running in your environment, see "Upgrade NNM iSPI NET" below.

Some NNM iSPI NET components are automatically installed with NNMi. However, the NNM iSPI NET diagnostics include a separately-installed diagnostics server, which is an embedded version of HP Operations Orchestration (HP OO) Central with restricted capabilities. NNM iSPI NET diagnostic flows can be run by this diagnostics server or by an HP OO Central server already installed in your environment.

> **Note:** If NNMi is installed on a system that has sufficient resources and is running the correct operating system version, you can install the embedded NNM iSPI NET diagnostics server on the same system. (See "Preinstallation Checklists" on page 41.)

Whether you want to install the NNM iSPI NET diagnostics server or use a pre-existing HP OO Central, you use the NNM iSPI NET diagnostics server installer. Two installation scenarios are described separately in the following sections:

- If HP OO Central is not installed on the system, the NNM iSPI NET diagnostics server installer installs the NNM iSPI NET diagnostics in their entirety, including the diagnostics server. The installer also sets up the binding between the diagnostics server and the NNMi management server.

- If HP OO Central is already installed, the NNM iSPI NET diagnostics server installer installs the NNM iSPI NET diagnostic flows and sets up the binding between HP OO Central and the NNMi management server.

Before you begin, complete the requirements in "Preinstallation Checklists" on page 41.

## Upgrade NNM iSPI NET

NNM iSPI NET version 9.10 enables new functionality in the NNMi console; it does not change the diagnostic flows, which were first delivered in NNM iSPI NET version 8.10.

If the NNM iSPI NET diagnostic flows are running correctly in an NNMi 8.1x or 9.0x environment, you do not need to install the NNM iSPI NET diagnostics server software provided with NNM iSPI NET version 9.10, nor do you need to change the HP OO configuration.

If you decide to upgrade the NNM iSPI NET diagnostics server, use the procedure that applies to your situation:

- "Upgrading the Embedded NNM iSPI NET Diagnostics Server" below

- "Upgrading an Existing HP OO Central Server that Includes NNM iSPI NET Diagnostics Flows" on the next page

## *Upgrading the Embedded NNM iSPI NET Diagnostics Server*

Upgrading the embedded NNM iSPI NET diagnostics server has the following effects:

- Because the upgrade process requires a new installation of the diagnostics server, information from previously run flows is lost.

- NNMi retains the links to the previously run flows, but the information is no longer accessible.

The procedure for upgrading the embedded NNM iSPI NET diagnostics server depends on the operating system of the current embedded NNM iSPI NET diagnostics server.

- If the embedded HP OO Central is running on a 32-bit operating system (an unsupported configuration that is no longer installable), prepare a 64-bit system, and then install the NNM iSPI NET diagnostics server as described in "Installing NNM iSPI NET Diagnostics on a System Without a Pre-existing HP OO Central" on page 53.

  An NNMi management server can be connected to only one HP OO Central server at a time. Configuring the connection between NNMi and the new NNM iSPI NET diagnostics server removes the connection between NNMi and the prior NNMi diagnostics server.

- If the embedded HP OO Central is running on a 64-bit system, uninstall the older NNM iSPI NET diagnostics server and then install the new NNM iSPI NET diagnostics server as described in this section.

To upgrade the embedded NNM iSPI NET diagnostics server, follow these steps:

> **Note:** If another application is using MySQL Server 5.0, following this procedure disables that application.

1. Remove the embedded diagnostics server as follows:

   a. Log on as an administrator to the system where the diagnostics server is installed.

   b. Stop the services of the embedded HP OO Central: **RSCentral**, **RSJRAS**, and **RSScheduler**.

   c. Open the Control Panel, and then click **Add or Remove Programs**

      ○ Remove **HP Operations Orchestration Central**.

      ○ Remove **MySQL Server**.

d. Remove the directories where HP OO Central has been installed, typically:
`<drive>:\Program Files (x86)\Hewlett-Packard\`
`Operations Orchestration`

e. Remove the directories where MySQL Server has been installed, typically:
`<drive>:\Program Files (x86)\MySQL\MySQL Server 5.0`

2. Install the new diagnostics server as described in "Installing NNM iSPI NET Diagnostics on a System Without a Pre-existing HP OO Central" on the next page.

## Upgrading an Existing HP OO Central Server that Includes NNM iSPI NET Diagnostics Flows

To upgrade the NNM iSPI NET diagnostic flows on a pre-existing HP OO Central server, follow these steps:

1. Upgrade the HP OO product as described in the HP OO documentation.

   For information about the supported versions of the full HP OO product, see the NNM iSPI NET Diagnostics Server System and Device Support Matrix.

2. Test the connection between NNMi and HP OO by running a diagnostic from NNMi as follows:

   a. Sign in to the NNMi console as an NNMi Operator 2 or Administrator.

   b. Select a node or incident to which at least one diagnostic flow has been assigned, and then click **Actions > Run Diagnostics**.

3. Evaluate the test results as follows:

   ▪ If the flow runs correctly, the connection between NNMi and HP OO Central is still working correctly.

   ▪ If the test flow did not run correctly, reestablish the connection by following the steps in "Installing the NNM iSPI NET Diagnostic Flows on an Existing HP OO Central Server" on page 56.

   The installation overwrites the HP-provided diagnostic flows, which are unchanged from previous versions of NNM iSPI NET.

## Install NNM iSPI NET

To install NNM iSPI NET, first install NNMi as described in the *NNMi Installation Guide*. This installation provides the SNMP trap analytics and the Visio export functionality. Then, install the NNM iSPI NET diagnostics server and diagnostic flows.

> **Note:** The NNM iSPI NET diagnostics server installer requires an HTTP connection to the NNMi management server.

Use the procedure that applies to your situation:

## *Installing NNM iSPI NET Diagnostics on a System Without a Pre-existing HP OO Central*

To install the NNM iSPI NET diagnostics server and flows on a system that does not have an HP OO Central already installed, follow these steps:

1. Log on with administrator privileges to the system where you plan to install the NNM iSPI NET diagnostics.

2. Insert the NNM iSPI NET installation DVD into the DVD-ROM drive, or download the electronic installation media.

3. In the root directory of the installation media, double-click the setup_x64.exe file.

   The installer Welcome window lists the installation steps. These steps are described in this procedure.

   **Note:** If components such as .NET or MySQL are already installed, a check mark indicates that these installation steps are complete.
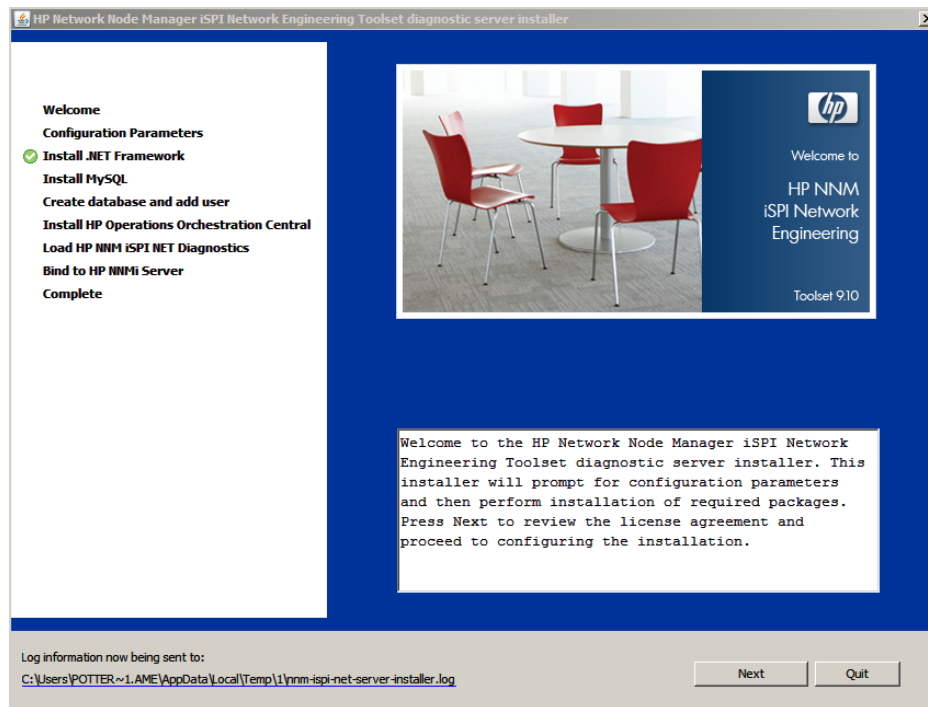
4. Click **Next**, and then accept the license agreement.

   The Configuration Parameters window appears, as shown here.



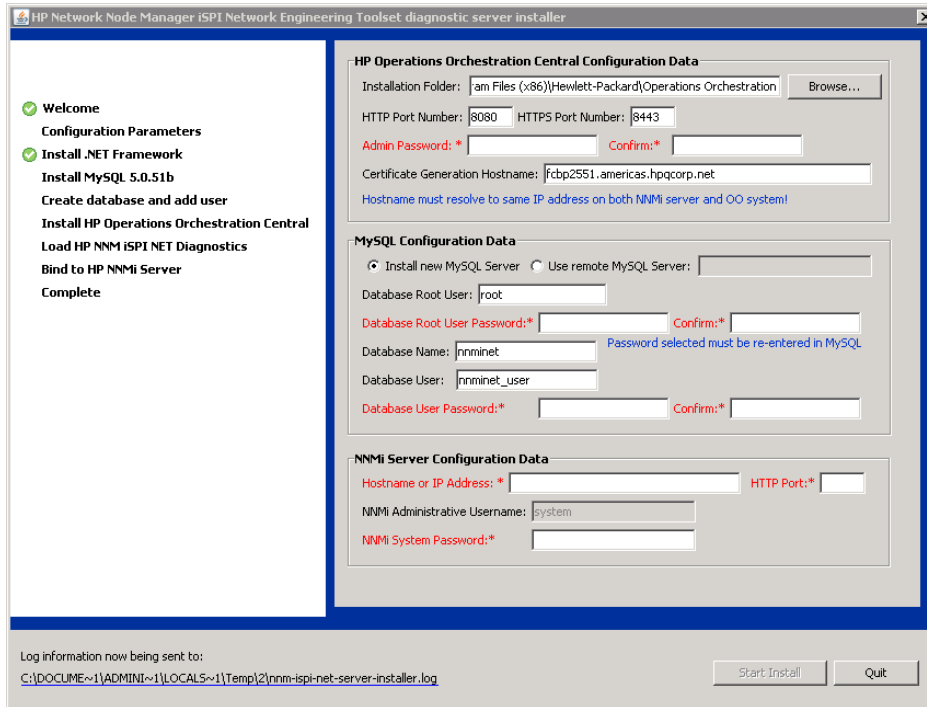5. Review the fields provided in the Configuration Parameters window and note the following:

   - The labels for required fields appear in red text, followed by an asterisk. After valid data has been entered, the asterisk disappears and the label text turns black.

   - The **HP Operations Orchestration Central Configuration Data** items refer to the diagnostics server. This server is an embedded HP OO Central server. In this procedure, "Configure the diagnostics server as follows:" below and "Configure MySQL as follows:" on the next page provide the parameters for installing and configuring this embedded diagnostics server.

6. Configure the diagnostics server as follows:

   - Optionally, change the installation directory for the embedded HP OO Central.

   - Verify the HP OO Central HTTP and HTTPS ports, and change them if necessary.

     **Note:** Communication between the embedded HP OO Central web application and the HP OO Central web client is over secure connections, using the HTTPS protocol. The HTTP port makes it possible for client users to type an HTTP protocol address in the browser and be redirected to the secure connection.

- Enter a password for the diagnostics server `admin` account. At the end of the installation process, you use this password for the user `admin` in the embedded HP OO Central logon window.

- Verify the current system's hostname for SSL certificate generation.

  > **Note:** If you are installing the NNM iSPI NET diagnostics server on a separate system from NNMi, the hostname in this field must match the hostname that the NNMi management server identifies as the diagnostics server's hostname. If you are not sure that the NNMi management server can identify the diagnostics server's hostname, follow the steps in "Diagnostics Server System Preparation" on page 42.

7. Configure MySQL as follows:

   - Do one of the following:

     ○ Select **Install new MySQL Server**.

     ○ Select **Use remote MySQL Server**, and then enter the hostname or IP address of the remote server.

   - Optionally, change the database `root` user name.

   - Enter the database `root` user password.

   - Optionally, change the database name.

   - Optionally, change the database user name.

   - Enter the database user password.

8. Identify the NNMi management server as follows:

   - Enter the hostname or IP address of the NNMi management server.

   - Enter the HTTP port of the NNMi management server.

   - Enter the password for the NNMi`system` user.

9. After you fill in the required configuration information, **Start Install** becomes active.

   > **Note:** As with any configuration and set-up procedure, you need to retain the configuration values you entered. Especially, you will need the MySQL `root` user password again shortly, during the MySQL installation step.

10. Click **Start Install**. You can view the installation log file at any time during the installation by clicking the log file link in the lower-left corner of the installer window.

11. Unless MySQL is already installed, the MySQL installation begins.

The MySQL installer runs independently from the NNM iSPI NET diagnostics server installer. Because of this, if you are installing MySQL, you need to do the following:

a. Provide MySQL configuration information again (for example, the `root` database user name).

b. Press **Continue** in the NNM iSPI NET diagnostics server installer window after MySQL configuration is finished. This manual step ensures that MySQL is active before the NNM iSPI NET diagnostics server installer accesses it.

12. The remaining steps of the NNM iSPI NET diagnostics server installation complete automatically:

- Installing the embedded HP OO Central server

- Loading the NNM iSPI NET diagnostic flows

- Binding to the NNMi management server

These steps could take several minutes to complete on a slow system.

After all installation steps complete, a completion message appears in the installer window and **Finish** becomes active.

> **Note:** By default, the embedded HP OO Central user interface opens when you click **Finish**. To skip this launch, clear the **Launch HP OO** check box.

13. Click **Finish** to close the installer window.

If you chose to launch the embedded HP OO Central user interface, your browser opens.

You might see an invalid SSL certificate message because the installer includes, by default, a self-signed certificate that serves as a placeholder for a valid customer-obtained certificate. You can safely ignore this warning.

## *Installing the NNM iSPI NET Diagnostic Flows on an Existing HP OO Central Server*

To install the NNM iSPI NET diagnostic flows on a pre-existing HP OO Central server, follow these steps:

1. Log on with administrator privileges to the system running the existing HP OO Central.

2. Insert the NNM iSPI NET installation DVD into the DVD-ROM drive, or download the electronic installation media.

3. In the root directory of the installation media, start the installer:

- If the HP OO Central server is running on a 32-bit operating system, double-click the `setup.exe` file.

- If the HP OO Central server is running on a 64-bit operating system, double-click the `setup_x64.exe` file.

    The installer Welcome window lists the installation steps. These steps are described in this procedure.

> **Note:** Because HP OO Central is already installed on this system, check marks indicate the installation steps that have already been completed.
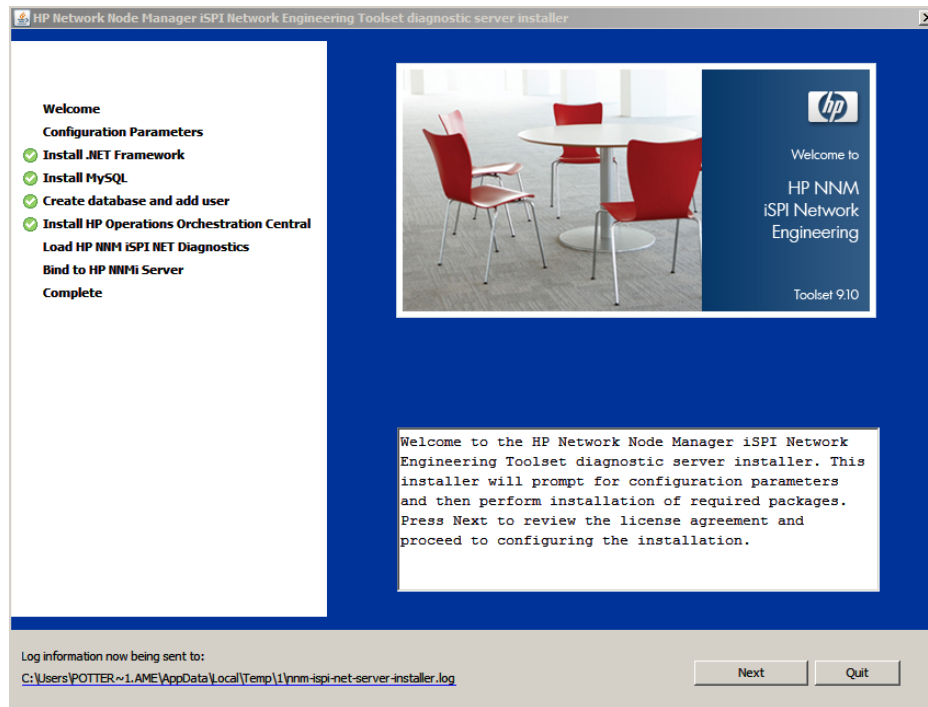


4. Click **Next**, and then accept the license agreement.

    The Configuration Parameters window appears, as shown here.

5. Review the fields provided in the Configuration Parameters window and note the following:
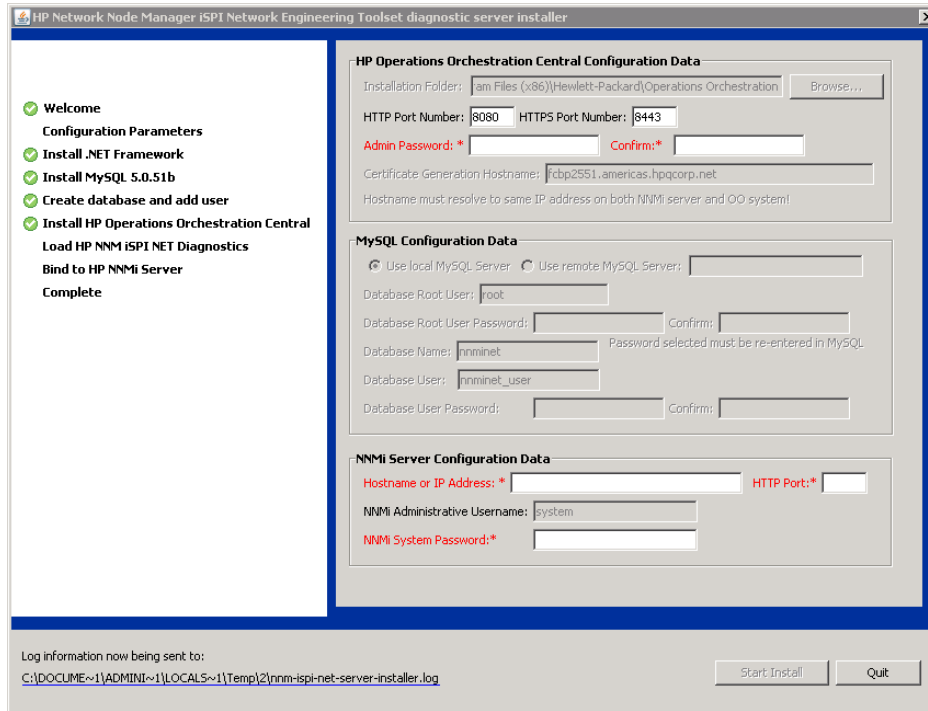
   - The labels for required fields appear in red text, followed by an asterisk. After valid data has been entered, the asterisk disappears and the label text turns black.

   - Because HP OO Central is already installed on this system, many of the configuration fields are not available.

6. Do the following:

   Verify the HP OO Central HTTP and HTTPS ports, and change them if necessary.

   > **Note:** Communication between the embedded HP OO Central web application and the HP OO Central web client is over secure connections, using the HTTPS protocol. The HTTP port makes it possible for client users to type an HTTP protocol address in the browser and be redirected to the secure connection.

   - Enter the password for the HP OO Central `admin` user.

   - Enter the hostname or IP address, HTTP port, and password for the `system` user for the NNMi management server.

   After you enter the required configuration information, **Start Install** becomes active.

   > **Note:** As with any configuration and set-up procedure, you need to retain the configuration

values you entered.

7. Click **Start Install**. The remaining steps of the NNM iSPI NET diagnostics server installer complete automatically:

   ■ Loading the NNM iSPI NET diagnostic flows

   ■ Binding to the NNMi management server

   You can view the installation log file at any time during the installation by clicking the log file link in the lower left-corner of the installer window.

8. After all installation steps complete, a completion message appears in the installer window and **Finish** becomes active.

   **Note:** By default, the HP OO Central user interface opens when you click **Finish**. To skip this launch, clear the **Launch HP OO** check box

9. Click **Finish** to close the installer window.

## *Creating Users on the Diagnostics Server*

To view results from NNM iSPI NET diagnostic flows, NNMi users must open pages on the server where the diagnostic flows are installed. To do so, these users need user accounts on the diagnostics server.

If you installed the diagnostic flows on a pre-existing HP OO Central server, work with the HP OO Central systems administrator to set up HP OO user accounts.

If you are using the embedded NNM iSPI NET diagnostics server, you should set up user accounts for NNMi users on the diagnostics server. For ease of use, set up the user names and passwords to match pre-existing NNMi user accounts. This best practice makes it easier to update accounts for future releases of NNM iSPI NET.

To set up user accounts on the diagnostics server:

1. Open the diagnostics server log-on page by entering the following URL into a web browser window:

   **http://*<hostname>*:*<port>*/PAS/**

   Where *<hostname>* is the name of the diagnostics server and *<port>* is the port that you specified for the embedded HP OO Central during server installation.

2. Log on as **admin** using the password you specified during installation.

3. On the **Administration** tab, click **Manage Users**.

4. For each user account, do the following:

a. Click **Add New User**.

b. Enter a user account name.

c. Select the **Internal Account** check box.

d. Enter the account password in the **User Password** and **Verify Password** fields.

e. Click **Create User**.

For more information about HP OO Central users, capabilities, and permissions, see the *Users, groups, and access control* section of the HP OO Central help.

# License NNM iSPI NET

When you install NNMi, the NNM iSPI NET functionality is enabled with a temporary Instant-On license key. Purchase a permanent NNM iSPI NET license separately from your permanent NNMi license. You should obtain and install a permanent license key as soon as possible.

## *Checking the License Type*

To determine the type of license that NNM iSPI NET is using, in the NNMi console, click **Help > System Information**. In the System Information window, click **View Licensing Information**.

## *Obtaining and Installing a Permanent License Key*

To obtain and install a permanent license key for NNM iSPI NET on the NNMi system, use the NNMi `nnmlicense.ovpl` tool.

Before requesting a permanent license key, gather the following information:

- The Entitlement Certificate, which contains the HP product number and order number for NNM iSPI NET

- The IP address of the NNMi management server

- Your company or organization information

After gathering the necessary information, complete one of the following processes for obtaining and installing an NNM iSPI NET license key.

### *Automated Process*

For automated assistance with the NNM iSPI NET license key, follow these steps:

1. At a command prompt on the NNMi management server, enter the following:

```
nnmlicense.ovpl iSPI-NET -g
```

> **Note:** The product license ID (`iSPI-NET`) is case-sensitive.

2. In the **License Password** dialog box, click **Request License**.

3. Follow the instructions on the screen to obtain the permanent license key.

## *Manual Process*

If the automated process does not run to completion (for example, if the NNMi management server is behind a firewall), follow these steps:

1. To obtain a license key, go to the HP password delivery service at

   **https://webware.hp.com/welcome.asp**

2. At a command prompt on the NNMi management server, enter the following command to update the system and to store license data files:

   `nnmlicense.ovpl iSPI-NET -f <license_file>`

   > **Note:** The product license ID (`iSPI-NET`) is case-sensitive.

See the *nnmlicense.ovpl* reference page, or the UNIX manpage, for more information.

# *Obtain Additional License Keys*

Contact your HP Sales Representative or your Authorized Hewlett-Packard Reseller for information about the NNMi and NNM iSPI NET licensing structure and to learn how to add license tiers for enterprise installations.

To obtain additional license keys, go to the HP password delivery service:

**https://webware.hp.com/welcome.asp**

# **Disable NNMi Triggering of Diagnostic Flows**

You might want to disable NNMi triggering of diagnostic flows without removing the server running those flows.

# *Disabling Diagnostic Flows*

To stop NNMi from automatically triggering the diagnostic flows, follow these steps:

1. Log on as an administrator to the NNMi management server.

2. In a command window, navigate to the support directory:

*Windows*: *<drive>*:\Program Files\HP\HP BTO Software\
support\

*UNIX®*: /opt/OV/support/

3. Run the nnmdiagnostics.ovpl command with the uninstall option:

   nnmdiagnostics.ovpl uninstall

   > **Note:** The nnmdiagnostics.ovpl command can also do the following:
   >
   > ▪ Determine the current HP OO Central server configuration:
   >
   >   nnmdiagnostics.ovpl servers
   >
   > ▪ Change the password NNMi uses for the admin account on the HP OO Central server:
   >
   >   nnmdiagnostics.ovpl credentials
   >
   > If the admin account password changes on the HP OO Central server (whether the embedded diagnostics server or an existing HP OO Central server), NNMi needs to be informed of the change. Use nnmdiagnostics.ovpl credentials to provide NNMi with the new password.

## *Re-Enabling Diagnostic Flows*

You can re-enable the triggering of the diagnostic flows by running the installer on the diagnostics server or on the HP OO Central server. For more information, see one of the following:

- "Installing NNM iSPI NET Diagnostics on a System Without a Pre-existing HP OO Central" on page 53.

- "Installing the NNM iSPI NET Diagnostic Flows on an Existing HP OO Central Server" on page 56.

The installer detects that the needed software is already installed and performs the configuration steps.

## Remove NNM iSPI NET

To remove the NNM iSPI NET software, do the following:

- "Remove NNM iSPI NET References from the NNMi Console" below

- "Disable the Triggering of Diagnostic Flows" on the next page

- "Remove the Diagnostic Flows and Server" on the next page

**Remove** NNM iSPI NET **References from the NNMi Console**

If NNM iSPI NET is unlicensed, you can remove references to it from the NNMi console; follow these steps:

> **Note:** The steps in this task remove all menu items, views and workspaces for any unlicensed function, including NNMi Advanced and other NNM iSPIs if they are also unlicensed.

1. Sign in to the NNMi console as an NNMi Administrator.

2. From the workspaces navigation panel, select the **Configuration** workspace.

3. Expand **User Interface**.

4. Select **User Interface Configuration**.

5. Clear the **Show Unlicensed Features** check box.

6. Click **Save and Close**.

To remove an NNM iSPI NET license key (making NNM iSPI NET unlicensed), follow these steps:

1. At a command prompt on the NNMi management server, enter the following:

   ```
   nnmlicense.ovpl iSPI-NET -g
   ```

   > **Note:** The product license ID (`iSPI-NET`) is case-sensitive.

2. In the **License Password** dialog box, click **Remove License Key**.

**Disable the Triggering of Diagnostic Flows**

To disable the running of diagnostic flows triggered by NNMi incidents, follow these steps:

1. Log on as an administrator to the NNMi management server.

2. In a command window, navigate to the support directory:

   *Windows*: *<drive>*:`\Program Files\HP\HP BTO Software\`
   `support\`

   *UNIX*: `/opt/OV/support/`

3. Run the `nnmdiagnostics.ovpl` command with the `uninstall` option:

   ```
   nnmdiagnostics.ovpl uninstall
   ```

**Remove the Diagnostic Flows and Server**

The NNM iSPI NET diagnostics server is an embedded HP OO Central with restricted capabilities. To unlink and remove the embedded HP OO Central server and the NNM iSPI NET diagnostic flows, follow these steps:

1. Make sure that all HP OO Central users log off.

2. Remove the embedded diagnostics server as follows:

   a. Log on as an administrator to the system where the diagnostics server is installed.

   b. Stop the services of the embedded HP OO Central: **RSCentral**, **RSJRAS**, and **RSScheduler**.

   c. Open the Control Panel, and then click **Programs & Features**.

      ○ Remove **HP Operations Orchestration Central**.

      ○ (Optional) If the embedded HP OO Central is the only application using MySQL Server, remove **MySQL Server**

   d. Remove the directories where HP OO Central has been installed, typically:
      *<drive>*:\Program Files\Hewlett-Packard\
      Operations Orchestration

   e. (Optional) Remove the directories where MySQL Server has been installed, typically:
      *<drive>*:\Program Files\MySQL\MySQL Server 5.1

   f. (Optional) Remove the MySQL Server data files, typically:
      *<drive>*:\ProgramData\MySQL\MySQL Server 5.1

# Chapter 4: About NNM iSPI NET Components

This chapter provides information to help you begin using the NNM iSPI NET tools.

## NNM iSPI NET Diagnostics

NNM iSPI NET diagnostic flows are sets of automated commands specific to one or more device types. You associate these flows with incident configurations, including the associated node group and lifecycle state.

NNMi automatically triggers the configured flows when an incident changes to the specified lifecycle state. Links to the diagnostic flow results appear on the **Diagnostics** tab of the **Incident** form. Flow results can help you troubleshoot the problem on the source node.

- Examples of the kinds of diagnostics that NNM iSPI NET provides include the following:

- Determine the current configuration of a Cisco router, Cisco switch, or Nortel switch.

- Perform diagnostic checks on a specified interface on a Cisco router.

- Obtain routing information using the `show ip route` command.

- Determine failures of tracing the route to a target node.

- Determine statistics for a specified port on a Nortel switch.

For information about the available diagnostics, see *Diagnostics (Flows) Provided by NNM iSPI NET* in the NNMi help.

### *Configuring NNM iSPI NET Diagnostics*

To configure NNM iSPI NET to automatically gather diagnostic information about the source node whenever an incident reaches a specific lifecycle state, follow these steps:

1. Sign in to the NNMi console as an NNMi Administrator.

2. Open an incident configuration.

3. On the Node Settings tab, click **New**.

4. On the **Node Settings** form, do the following:

   - Specify the node group for which you want to automatically gather diagnostic information.

   - On the **Diagnostic Selections** tab, specify the flow NNMi should run on each applicable source node in the node group for the incident you are configuring.

   - For each flow, specify the appropriate incident lifecycle state.

For more information, see *Configure Diagnostics for an Incident* in the NNMi help.

## *Using NNM iSPI NET Diagnostics*

After you configure a diagnostic for the incident and node group, the following criteria must be met before the diagnostic can run:

- The source node must be in the node group you have selected.

- The diagnostic must be valid for the source node. (For example, only Nortel switch diagnostics are run on Nortel switches.)

- The incident's current lifecycle state must match a lifecycle state for which it was configured. (For example, if you configure the incident to run a specified diagnostic when the incident is closed, if the current incident's lifecycle state changes to Closed, NNMi runs that diagnostic.)

- Device credentials for the source node must be set up in NNMi. See "NNMi Management Server Preparation" on page 41.

If these criteria are met, NNM iSPI NET runs the diagnostics and generates diagnostic reports to help you solve the problem on the source node.

> **Note:** If NNMi has incorrect device credentials for the source node, the diagnostic report shows a device communication problem rather than the results of the diagnostic flow.

You can run diagnostics on demand, using **Actions** > **Run Diagnostics** from the associated Node form. In this way, you can gather baseline information for a device before any problems occur. You can also use **Actions** > **Run Diagnostics** from an Incident form.

In addition, NNM iSPI NET associates diagnostics with the node on which the diagnostic was run. To view the diagnostics automatically invoked for the node, open the **Node** form for any node of interest.

For information about diagnostic results, see *Incident Diagnostic Results Form (Flow Run Result)* and *Node Diagnostic Results Form (Flow Run Result)* in the NNMi help.

# Custom HP OO Flow Management

If you have the full HP OO product, you can import HP OO flow definitions into NNMi and then assign these flows to run when NNMi detects certain network incidents.

The process for importing an HP OO flow definition into NNMi is as follows:

1. In HP OO Studio, build and test the flow.

   Depending on the incident type, NNMi can pass any or all of the following data types to the flow:

   - Device credentials (user name and password)

   - Device hostname

- Interface name

- Interface type

- Interface alias

- Interface index

- Port name

- Port index

2. Create a flow definition file that describes the HP OO flow to NNMi.

   For information about the syntax of this file, see the *nnmooflow.ovpl* reference page, or the UNIX manpage.

3. Run the `nnmooflow.ovpl -i` command to import the HP OO flow definition.

4. Assign the HP OO flow definition to an incident configuration for a specific node group as described in "Configuring NNM iSPI NET Diagnostics" on page 65.

The `nnmooflow.ovpl` command provides the following functionality:

- List the available flows (HP-provided diagnostic flows and custom HP OO flow definitions).

- Import custom HP OO flow definitions.

- Delete custom HP OO flow definitions that are not currently assigned to any incident configuration.

For more information, see the *nnmooflow.ovpl* reference page, or the UNIX manpage.

## NNM iSPI NET SNMP Trap Analytics

By default, NNMi measures the rate of incoming traps, including the following:

- The rate of incoming SNMP traps from each device

- The rate of each incoming trap for each trap object identifier (OID)

NNMi monitors this trap information to determine whether any incoming traps exceed the configured rate threshold. If a threshold is exceeded, NNMi blocks the traps from the device (or for the specific trap OID) until the trap rate falls below the minimum rearm value. The NNMi administrator can configure the threshold and rearm values with the `nnmtrapconfig.ovpl` command. For more information, see the *nnmtrapconfig.ovpl* reference page, or the UNIX manpage.

NNM iSPI NET SNMP Trap Analytics provides reports about this trap information according to the following criteria:

- Within a specific time period

- For a specific node

- According to a specific trap identifier (trap OID)

When analyzing traps, NNMi looks at both the most common traps, as well as the most common source nodes from which the traps are received. This SNMP trap analytics data is logged to the `trapanalytics.0.0.log` file.

Information in the log file is organized as follows for specific time intervals:

- Trap rate in number of traps per second

- The top 10 addresses that are generating traps

- The top 10 traps that are being generated

In the NNMi console, you can access the `trapanalytics.0.0.log` file with **Tools > Trap Analytics > Trap Analysis Log**. For information about individual traps that arrived in the time window mentioned in the analytics report, use the `nnmtrapdump.ovpl` command. For more information, including details on the `trapanalytics.0.0.log` file and its location, see the *nnmtrapdump.ovpl* reference page, or the UNIX manpage.

The **Tools > Trap Analytics** menu in the NNMi console provides access to trap analytics reports. From a report window, you can start graphs of the trap rate for one or more nodes or trap OIDs.

For more information about the NNM iSPI NET SNMP Trap Analytics reports, see *Analyze Trap Information* in the NNMi help.

# NNM iSPI NET Visio Export Functionality

You can export the information from one or more NNMi topology maps to an XML formatted (.vdx) file that Visio can read. For example, you might want to export the Network Overview topology map before a major change to your network infrastructure. You can open this file in Visio, and you can share the file with people who do not use NNMi.

The **Tools > Visio Export > Current Map** command creates a Visio file containing one sheet that shows the topology of the map from which you invoke the command.

The **Tools > Visio Export > Saved Node Group Maps** command creates a Visio file containing one sheet per node group map. To include a node group map in this larger file, select the **Include in Visio Export** check box on the **Node Group Map Settings** form for the node group.

For more information about the Visio export functionality, including how you can modify and print the file within Visio, see *Export Maps to Microsoft Visio* in the NNMi help.

# Chapter 5: Maintaining the NNM iSPI NET Diagnostics Server

If you are running the NNM iSPI NET diagnostics server, not the full HP Operations Orchestration (HP OO) product, read this chapter for information to help you maintain the embedded NNM iSPI NET diagnostics server.

## Back up the Diagnostics Server Database

The NNM iSPI NET diagnostics server includes the MySQL database, which includes the `mysqldump.exe` command for backing up the contents of the database.

"Example MySQL Backup Script" below shows an example script for backing up the diagnostics server database with the `mysqldump.exe` command. In this example, make the following substitutions:

- Set the `DATABASE` variable to the database name specified during installation of the diagnostics sever.

- Set the `ROOTUSER_PASSWORD` variable to be the password of the MySQL database entered during installation of the diagnostics server.

Example MySQL Backup Script

```
@Echo Off
@For /F "tokens=1,2,3,4 delims=/ " %%A in ('Date /t') do @(
Set All=%%A%%B%%C%%D
)

@For /F "tokens=1,2,3 delims=: " %%A in ('Time /t') do @(
Set All=%ALL%_%%A_%%B_%%C
)

Set DATABASE=nnmi
Set ROOTUSER=root
Set ROOTUSER_PASSWORD=admin

REM NNM iSPI-NET 9.10

"C:\Program Files\MySQL\MySQL Server 5.1\bin\mysqldump.exe" -u%ROOTUSER%
-p%ROOTUSER_PASSWORD% --lock-tables --databases %DATABASE% >
nnminet_db_backup_%All%
```

**Note:** The example shown in "Example MySQL Backup Script" above applies to NNM iSPI NET version 9.10. For earlier versions of NNM iSPI NET, the mysqldump.exe command is in the *<Drive>*`:\Program Files (x86)\MySql\MySql Server 5.0\bin` directory.

# Back up HP OO Configuration Files

Before changing the configuration of the NNM iSPI NET diagnostics server, back up the HP OO configuration files in the following directories:

- *<Drive>*:\Program Files\Hewlett-Packard\
  Operations Orchestration\Central\conf

- *<Drive>*:\Program Files\Hewlett-Packard\
  Operations Orchestration\RAS\Java\Default\web app\conf

- *<Drive>*:\Program Files\Hewlett-Packard\
  Operations Orchestration\Scheduler\conf

# Appendix A: Troubleshooting Installation and Runtime Problems

## Diagnostics Server Installation Problems

If you encounter errors during installation of the NNM iSPI NET diagnostics server, the error first appears in an error message window. After you close the message window, the installer Welcome window displays the error message in the text box. The NNM iSPI NET diagnostics server installer logs all error messages to the installation log.

The installation log is named `nnm-ispi-net-server-installer.log`. This file is created in the temporary files directory (as set with the `%TEMP%` environment variable) for the user doing the install.

You can restart the installation without having to close the installer window. If you click **Start Over** to restart the installation, the **Configuration Parameters** dialog is populated with the values you specified previously. This restart can be helpful if you have specified an incorrect user name or password for one of the components, or an HTTP or HTTPS port that is already in use. You can leave all other parameters as originally specified and change only the problem parameter. However, be aware that these configuration parameters do not persist after you exit the installer. If you exit the installer and then run it, you need to type the configuration parameters again.

*Problem*: Diagnostics server installation subprocesses do not terminate immediately when installation is canceled

**Solution**:

If you click **Quit** in the main server installer window, the .NET and HP OO installation subprocesses run to completion after they are initiated as part of the install. The MySQL installation subprocess can be canceled from the MySQL installer window.

*Problem:* Cannot create database or add user during MySQL configuration

**Solution**:

If you are using the embedded HP OO Central diagnostics server:

- During MySQL configuration, you might have specified a different password for the MySQL `root` account than the password specified in the NNM iSPI NET diagnostics server installer Configuration Parameters window. To verify the password for the MySQL `root` account:

  - At a command prompt, navigate to the `bin` directory under the MySQL install directory (typically, `C:\Program Files \MySQL\MySQL Server 5.1\bin\`).

  - Enter the following command:

    **mysql -u root -p**

  - At the password prompt, enter the same password for MySQL user `root` that you entered in the NNM iSPI NET diagnostics server installer Configuration Parameters window.

- If the password is correct, you see a `mysql>` prompt. If the password is incorrect, you see an Access Denied error.

After you have determined the correct password, either click **Start Over** in the NNM iSPI NET diagnostics server installer or run the installer again.

If you are using an existing MySQL server:

- Verify that you have the correct `root` user name and password. Change these values in the Configuration Parameters window, if necessary.

- If the existing MySQL database is on a remote system, verify that you can log on remotely to the `root` user account. If necessary, enable remote logon for the duration of the MySQL configuration step.

- Verify that your database and database user names do not conflict with names already in use on this MySQL server. Change these values in the Configuration Parameters window, if necessary.

After you have corrected any problems, click **Start Over** in the diagnostics server installer to try the MySQL configuration step again.

*Problem*: Diagnostics server installer reports an NNMi binding failure

This problem can occur if you incorrectly specify one or more of the NNMi fields in the Configuration Parameters step of NNM iSPI NET diagnostics server installation.

**Solution**:

To check that you have the correct values in these fields:

- Open a browser and navigate to **http://<*hostname*>:<*port*>/nnm**, where <*hostname*> is the value you specified during installation for the NNMi **Hostname or IP Address** and <*port*> is the value you specified during installation for the NNMi **HTTP Port**.

- Sign in to NNMi as the `system` user using the password you specified during installation for the NNMi **Administrative Password**.

After you have verified the NNMi management server's hostname, port, and `system` user password, either click **Start Over** in the NNM iSPI NET diagnostics server installer or run the installer again.

If you are using an existing HP OO Central server, verify that you have created the required certificate files as described under "Creating Certificate Files on an Existing HP OO Central Server" on page 45.

# Diagnostic Flows Runtime Problems

Messages related to the running of diagnostic flows are logged to the `nnm.0.0.log` (and older) files on the NNMi management server. If you encounter diagnostic submittal problems on the NNMi management server, check these log files for SEVERE and WARNING messages for the classes beginning with the string `com.hp.ov.nms.rba`.

The `nnm.0.0.log` file is in the following location:

- *Windows Server 2008*:

  `C:\ProgramData\HP\HP BTO Software\log\nnm\nnm.%g.%u.log`

- *UNIX*:

  `/var/opt/OV/log/nnm/nnm.%g.%u.log`

For more information about NNMi logging, including the versioning of log files, see the *logging.properties* reference page, or the UNIX manpage.

*Problem*: Diagnostic flows are listed as "Not Submitted"

If the flows displayed on the **Diagnostics** tab of a Node or Incident form are classified as "Not Submitted," NNMi might be unable to find device credentials for the target node, or the HP OO Central SSL certificates might be incorrect.

**Solution**:

Check the `nnm.0.0.log` file (or an older log file) on the NNMi management server for SEVERE or WARNING messages from the same time frame as the failing flows.

If the error messages indicate that a password or logon information is missing, use the **Communication Configuration** form in the **Configuration** workspace of the NNMi console to create **Default Device Credentials**. Then use **Regions** and **Specific Node Settings** to provide any device credentials that differ from the defaults.

If the error messages indicate a missing hostname or other communication issue with the HP OO Central server, verify that the SSL certificates have been set up on the HP OO Central server as described in "Creating Certificate Files on an Existing HP OO Central Server" on page 45.

*Problem*: Diagnostic flow results report a communication problem with the device

This problem indicates that NNMi has the wrong device credentials for this device.

**Solution**:

Telnet or ssh to the device to check whether the device credentials are correct.

After you have verified that you have the correct username and password, correct or add the appropriate setting using the **Default Device Credentials**, **Regions**, or **Specific Node Settings** tab on the **Communication Configuration** form in the NNMi console Configuration workspace.

*Problem*: NNMi reports 0 diagnostic flows submitted

This problem indicates that you have attempted to run a diagnostic flow for a device that has no associated flows.

**Solution**:

Only certain types of devices have associated diagnostic flows. See the NNM iSPI NET Diagnostics Server System and Device Support Matrix for details about supported devices.

*Problem*: NNMi does not use credentials supplied in Specific Node Settings

If the **Target Hostname** field of the Specific Node Settings form does not exactly match the value of the node hostname attribute in the NNMi inventory, NNMi might not find the correct credentials for the device.

**Solution**:

If NNMi found a fully-qualified domain name for a node during discovery, this name must be used to identify the node in **Specific Node Settings**. For example, suppose NNMi discovery processes have identified the node by its fully qualified domain name:

`rtr17.bldg3.example.com`

You cannot use **rtr17** or an IP address to identify the node in **Specific Node Settings**. You must use `rtr17.bldg3.example.com`. An IP address can be used only if NNMi does not have a fully-qualified domain name for the node.

To determine how NNMi has identified a node, open a Node form for the node from a topology map or a table view. The **Hostname** value in the Node form contains a fully qualified domain name or an IP address, depending on what NNMi found during discovery. Use the value from the **Hostname** field to identify the node in **Specific Node Settings**.

# Visio Export Functionality Problems

Messages related to Visio export are logged to the `nnm.0.0.log` (and older) files on the NNMi management server. If you experience problems with exporting maps to Visio, check these log files for SEVERE and WARNING messages for the following classes:

- `com.hp.ov.nms.ui.visio.*`

- `com.hp.ov.nms.ui.framework.web.servlets.VisioViewSerlvet`

The `nnm.0.0.log` file is in the following location:

- *Windows Server 2008*:

  `C:\ProgramData\HP\HP BTO Software\log\nnm\nnm.%g.%u.log`

- *UNIX*:

  `/var/opt/OV/log/nnm/nnm.%g.%u.log`

For more information about NNMi logging, including the versioning of log files, see the *logging.properties* reference page, or the UNIX manpage.

Problem: Cannot open the Visio file directly from NNMi

If the File Download window does not include the Open button, Visio is not installed on the computer where the NNMi console is running.

**Solution**:

Install the correct version of Visio (as described in the NNMi System and Device Support Matrix) on the computer running the NNMi console. Alternatively, you can save the file to the NNMi management server and then move it to a different computer where the correct version of Visio is installed.

*Problem*: Visio file does not open correctly

The Visio installation might be an incorrect version or might be corrupted.

**Solution**:

Install the correct version of Visio (as described in the NNMi System and Device Support Matrix).

*Problem*: Node group map not exported with Saved Node Group Maps command

The node group might not be configured correctly.

**Solution**:

For each node group map you want to export with the Saved Node Group Maps command, verify that the **Include in Visio Export** check box is selected on the Node Group Map Settings form.

*Problem*: Export is very slow

Each node on a map increases the export time.

**Solution**:

On the Node Group Map Settings form, reduce the values of the **Maximum Number of Displayed Nodes** and **Maximum Number of Displayed End Points** attributes.

*Problem*: Export file is too large

All information in the export increases the file size.

**Solution**:

In the Visio Map Export window, clear the **Include connection labels** check box. This configuration limits the amount of data exported for each connection, which results in a smaller file size.

*Problem*: No download window

One or both of the **Visio Map Export** and **File Download** windows do not open

**Solution**:

Check the `nnm.0.0.log` file (or an older log file) on the NNMi management server for SEVERE or WARNING messages.

*Problem*: Visio Export menu not enabled or gives Access Denied message

By default, the Visio export functionality requires that you sign in as an NNMi Operator 2 or Administrator.

**Solution**:

Ask the NNMi administrator to add you to the Operator 2 user group.

# nnmooflow.ovpl Command Problems

Messages regarding the `nnmooflow.ovpl` command are logged to the `nnm.0.0.log` (and older) files on the NNMi management server. If the nnmooflow.ovpl command generates an error message, check these log files for SEVERE and WARNING messages for the classes beginning with the string `com.hp.ov.nms.rba`.

The `nnm.0.0.log` file is in the following location:

- *Windows Server 2008*:

  `C:\ProgramData\HP\HP BTO Software\log\nnm\nnm.%g.%u.log`

- *UNIX*:

  `/var/opt/OV/log/nnm/nnm.%g.%u.log`

For more information about NNMi logging, including the versioning of log files, see the *logging.properties* reference page, or the UNIX manpage.

# We appreciate your feedback!

If you have comments about this document, you can contact the documentation team by email. If an email client is configured on this system, click the link above and an email window opens with the following information in the subject line:

**Feedback on Planning and Installation Guide (NNM iSPI Network Engineering Toolset Software 9.10)**

Just add your feedback to the email and click send.

If no email client is available, copy the information above to a new message in a web mail client, and send your feedback to docfeedback@hp.com.