HP OpenView
Service Information Portal 2.0

Configuring NNM

Windows NT®, Windows® 2000, HP-UX, and Solaris

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Conventions

The following typographical conventions are used in this manual.

Table 1

Font	What the Font Represents	Example
Italic	Book or manual titles and reference page or manpage names	Refer to the *HP OVW Developer's Guide*.
	Emphasis	You *must* follow these steps.
	A variable that you must supply when entering a command	To open a specific map when starting NNM, type `ovw -map` *map_name*, where you supply the map name.
Bold	Terms being defined for the first time	The **distinguishing attribute** of this class...
`Computer`	Text and items on the computer screen	The `Root` map window ...
		The system prompts: `Press Enter.`
	Cascading menu items	Select `Edit:Find->Object by Comment`
	Command names	Use the `ovstatus` command ...
	File and directory names	`/usr/bin/X11`
	Process names	Check to see if `pmd` is running.
	Window or dialog box names	In the `IP Internet` map window...
`Computer Bold`	Text that you must enter	At the prompt, type: **`ovstatus`**.
Keycap	Keyboard keys	Press **Return**.
`[Button]`	Buttons on the user interface	Click `[NET]`. Click on the `[Apply]` button.

Contact Information

Technical Support and Training
Technical support and training information can be found on the HP OpenView World Wide Web site at:

```
http://openview.hp.com/
```

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You can provide feedback about documentation:

- via e-mail to: `ovdoc@fc.hp.com`, or

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1 How NNM Works with SIP

The NNM Modules for SIP

HP OpenView Network Node Manager (NNM) provides up-to-date network status information that you can display to your customers through HP OpenView Service Information Portal (SIP).

For more information about NNM, itself, see *Managing Your Network with NNM* (provided with NNM software).

You can integrate any combination of the following NNM-data modules in SIP portal views. The information displayed within the modules is gathered from one NNM management station, or any number of NNM management stations and/or NNM collection stations:

- **Alarms module**
  A collection of alarm messages gathered from one or more alarm categories within NNM. You filter the alarms in a variety of ways so that only those alarms that are relevant to a particular customer are visible within each SIP portal view.

- **Network Device Health module**
  Custom gauges that track the health of network devices so that your customers can monitor network performance at-a-glance. Several predefined gauges are included, such as router health and server health. You can also write your own gauge definitions to monitor whatever is important to your customers. The data collection configuration required to run the gauges is automated and controlled through SIP configuration settings.

- **Topology (submaps) module**
  A collection of submaps from one or more NNM maps. Each map must be open on the NNM management station before the desired submap can be displayed in SIP. Drill-down through the NNM submap hierarchy can be provided, depending upon the settings in the topology configuration files.

Communication Paths Between NNM and SIP

The following three diagrams illustrate the processes involved in communicating data from SIP to HP OpenView NNM and visa versa.

The following diagram illustrates the communication path between the NNM Alarms module in SIP and NNM:

Figure 1-1   **Communication Process for the Alarms Module**
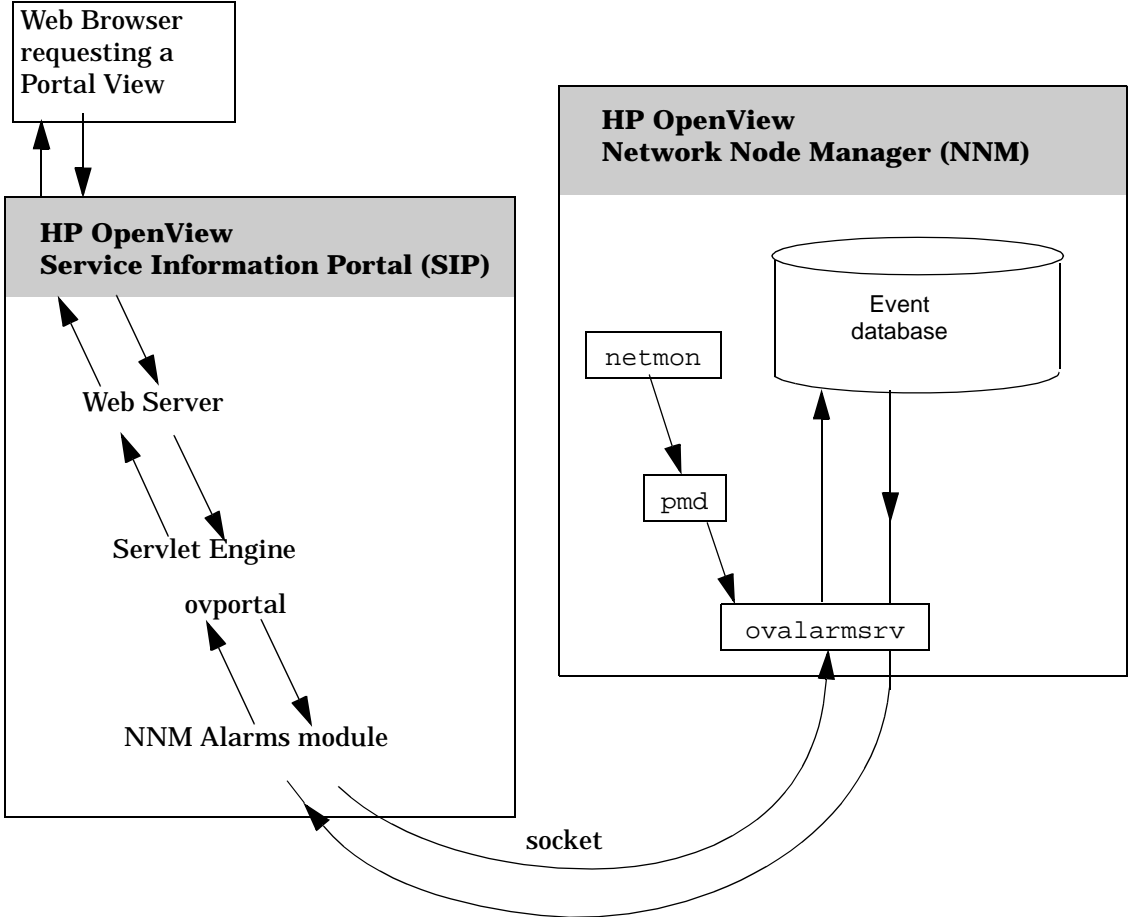
The following diagram illustrates the communication path between the NNM Network Device Health Gauge module in SIP and NNM:

Figure 1-2   **Communication Process for the Network Device Health Gauges**
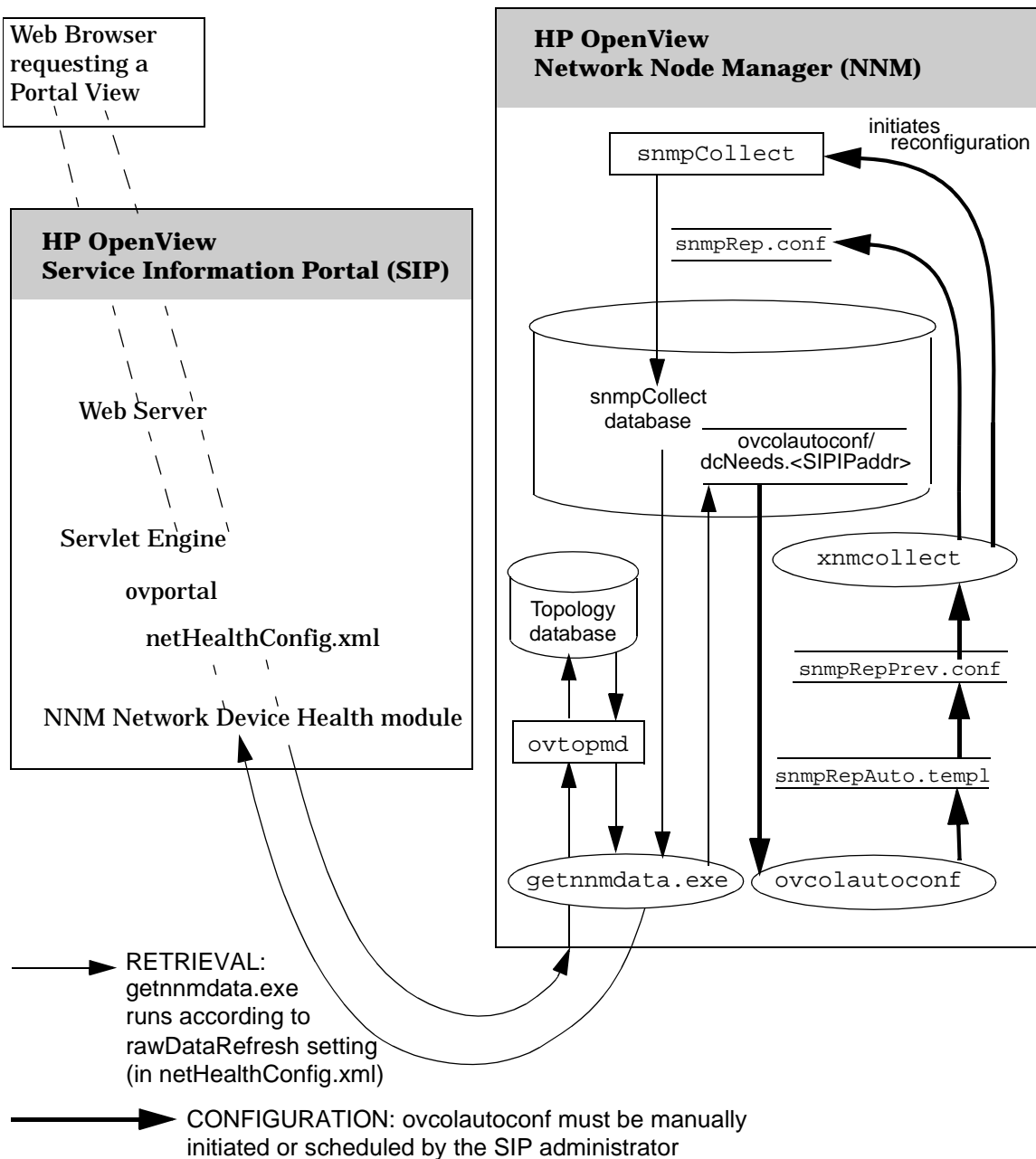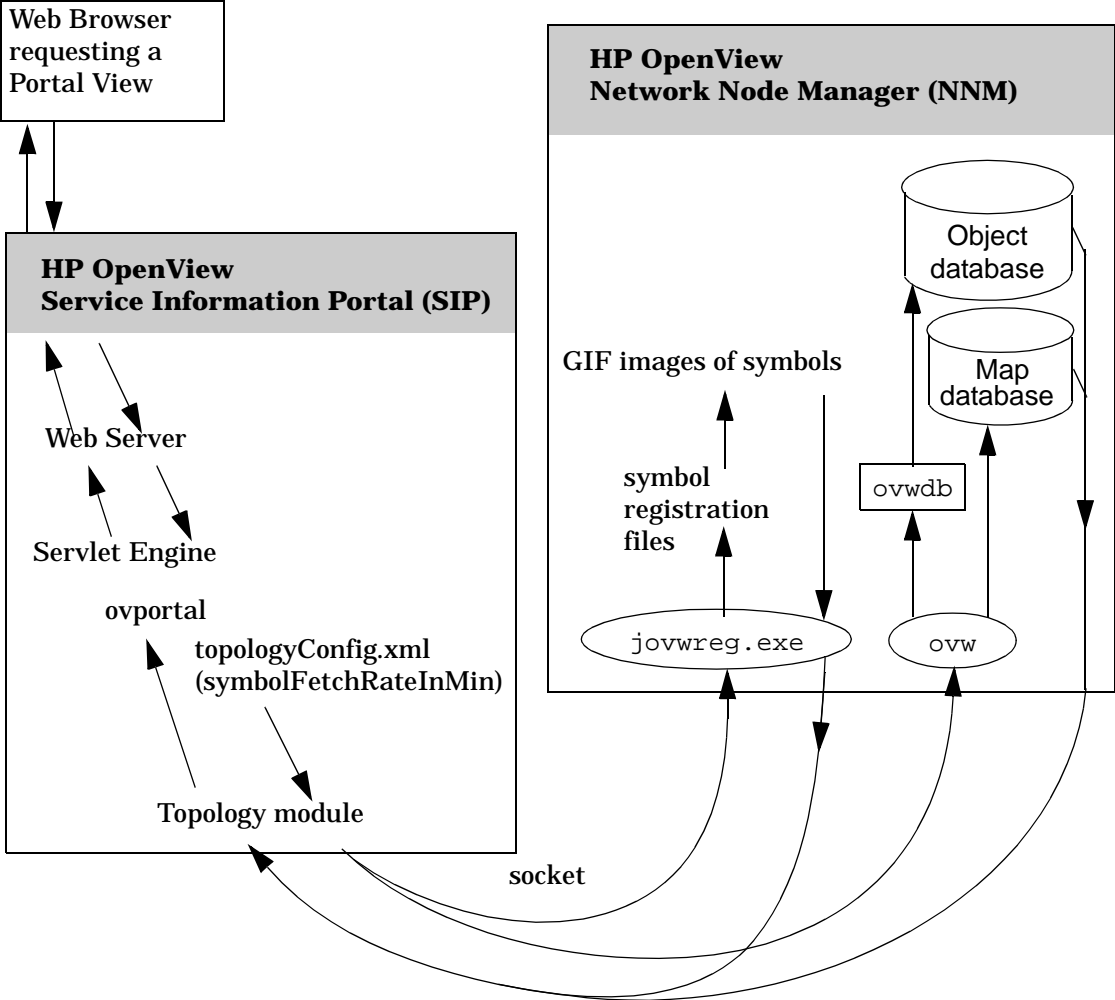
The following diagram illustrates the communication path between the Topology module in SIP and HP OpenView NNM:

Figure 1-3   **Communication Process for the Topology Module**

Installation of the NNM Modules for SIP

There are three modules included with SIP that display information from NNM management stations. These SIP modules are automatically installed along with SIP. Refer to the SIP 2.0 *Getting Started* guide (`Getting_Started.pdf`) for prerequisites, installation instructions for SIP, and required NNM patches.

Continue to "Establishing Communication Between NNM and SIP" on page 18 for instructions about configuring SIP and NNM management stations to communicate with each other.

You must complete the steps in this book before the NNM modules provided with SIP are operational:

- "Establishing Communication Between NNM and SIP" on page 18

  — "Enabling Alarm Module Access to NNM Data" on page 23

  — "Enabling Network Device Health Module Access to NNM Data" on page 24

  — "Enabling Topology Module Access to NNM Data" on page 31

For additional information about each NNM module and information about creating your own customized NNM modules for SIP, see *Presenting NNM Data* (`Presenting_NNM_Data.pdf`).

2 Configuration Steps

Establishing Communication Between NNM and SIP

To establish communication between SIP and your NNM management stations, you need to take the following steps on the SIP server and on each NNM management station.

SIP can be running on Windows NT/2000, HP-UX, or Solaris and can communicate with multiple NNM management stations running on any combination of Windows NT/2000, HP-UX, and/or Solaris.

On the SIP Server

1. In an ASCII or XML editor, open the `nmConfig.xml` file:

   • *Windows NT/2000:*

   `\<SIP_install_dir>\conf\share\modules\NM\nmConfig.xml`

   • *UNIX:*

   `/etc/opt/OV/SIP/conf/share/modules/NM/nmConfig.xml`

   This file contains the master list of all NNM management stations with which SIP is allowed to communicate.

2. Each NNM management station must have its own `<NNMStation>` element block (including NNM running on the same machine as SIP, if applicable). An example is provided in this file for you to copy and paste. (For more information open and read the `nmConfig.dtd` file in the same location.)

   Copy the text between the COMMENT lines and paste the `<NNMStation>` element block just above the `</NNMStationList>` element.

3. Provide the `hostname` of your NNM management station. All the port configuration information that you need is provided in the commented section. Simply delete the unnecessary information.

For example, to configure an NNM 6.2 management station running on Windows NT/2000:

```
<NNMStation
    hostname="mountain.rm.cnd.com"
    snmpDataSource="yes"
    alarmsDataSource="yes"
    symbolRegSource="yes"
    webSrvPort="80"
    ovwdbPort="2447"
    ovAlarmSrvPort="2953"
/>
```

To configure an NNM 6.1 management station running on Windows NT/2000:

```
<NNMStation
    hostname="mountain.rm.cnd.com"
    snmpDataSource="yes"
    alarmsDataSource="yes"
    symbolRegSource="yes"
    webSrvPort="80"
    ovwdbPort="9999"
    ovAlarmSrvPort="2345"
/>
```

To configure an NNM 6.2 management station running on UNIX:

```
<NNMStation
    hostname="mountain.rm.cnd.com"
    snmpDataSource="yes"
    alarmsDataSource="yes"
    symbolRegSource="yes"
    webSrvPort="8880"
    ovwdbPort="2447"
    ovAlarmSrvPort="2953"
/>
```

To configure an NNM 6.1 management station running on UNIX:

```
<NNMStation
    hostname="mountain.rm.cnd.com"
    snmpDataSource="yes"
    alarmsDataSource="yes"
    symbolRegSource="yes"
    webSrvPort="8880"
    ovwdbPort="9999"
    ovAlarmSrvPort="2345"
/>
```

4. You must stop and restart the servlet engine before the changes take effect:

   WindowsNT/2000:
   From the `Control Panel`, select `Services`. Stop and then restart `Tomcat`. Alternatively, you can use the command line: **net stop tomcat** and **net start tomcat**.

   UNIX:

   As `root`, stop and restart the web server and servlet engine by running the following. (The `DISPLAY` variable must be configured prior to restarting the webserver and servlet engine.)

   Stop on HP-UX: **/sbin/init.d/ovsip stop**
   Start on HP-UX: **/sbin/init.d/ovsip start**

   Stop on Solaris: **/etc/init.d/ovsip stop**
   Start on Solaris: **/etc/init.d/ovsip start**

5. *This step is only required if your NNM management station is running NNM version 6.1 (not required for NNM 6.2):*

   You need to copy the following executable file to a newly created temporary directory on each NNM management station that you listed in the `nmConfig.xml` file. This executable installs several required files (these files ship with NNM 6.2):

   - Copy the following file **from** SIP running on *Windows NT/2000* for NNM running on:

     — *Windows NT/2000*:
       SIP_inst_dir\cgi-bin\WindowsNT\installCGIs.zip

— *HP-UX*:
`\`*`SIP_inst_dir`*`\cgi-bin\HP-UX11\installCGIs.tar.Z`

— *Solaris*:
`\`*`SIP_inst_dir`*`\cgi-bin\Solaris2.X\installCGIs.tar`
`.Z`

- Copy the following file **from** SIP running on *UNIX* for NNM
running on:

— *Windows NT/2000*:
`/opt/OV/SIP/cgi-bin/WindowsNT/installCGIs.zip`

— *UNIX*:
`/opt/OV/SIP/cgi-bin/HP-UX11/installCGIs.tar.Z`

— *Solaris*:
`/opt/OV/SIP/cgi-bin/Solaris2.X/installCGIs.tar.Z`

On each NNM Management Station

1. Add the SIP server hostname(s) to the following two files. In an
ASCII editor, open the following two authorization configuration files
(skip this step if SIP is running on the same computer as NNM):

- The `ovw.auth` file controls which hosts and users are authorized
to connect to NNM sessions running on the management station:

— *Windows NT/2000*:
`<`*`NNM_install_dir`*`>\NNM\conf\ovw.auth`

— *UNIX*:
`/etc/opt/OV/share/conf/ovw.auth`

- The `ovwdb.auth` file controls which hosts and users are
authorized to connect to the NNM database processes:

— *Windows NT/2000*:
`<`*`NNM_install_dir`*`>\NNM\conf\ovwdb.auth`

— *UNIX*:
`/etc/opt/OV/share/conf/ovwdb.auth`

TIP   If you see a line that simply has two + symbols (+ +), you can skip this
step because NNM is configured to allow any computer to request

information (security not implemented).

Add a ***SIPserverHostName +*** line to the list for each SIP server that needs to obtain information from this NNM management station.

2. *Continue only if your NNM management station is running version 6.1:*

   At the command prompt, navigate to the `installCGIs.zip` or `installCGIs.tar` file that you placed on this NNM 6.1 management station in the previous section.

3. Unzip or uncompress and untar the file.

4. At the command prompt, type:

   - *Windows NT\2000*:
     NNM_inst_dir\bin\Perl\bin\perl.exe installCGIs.pl

   - *UNIX*:
     /opt/OV/bin/Perl/bin/perl installCGIs.pl

5. You can now remove the `installCGIs` file and the directory structure around it.

Enabling Alarm Module Access to NNM Data

Provided you set the alarmsDataSource parameter and the ovAlarmSrvPort parameter in the nmConfig.xml file (Refer to "On the SIP Server" on page 18), no configuration is required to enable the Alarms module in the out-of-the-box portal views provided with the SIP installation.

For example:

```
<NNMStation
     hostname="mountain.rm.cnd.com"
     snmpDataSource="yes"
     alarmsDataSource="yes"
     symbolRegSource="yes"
     webSrvPort="80"
     ovwdbPort="2447"
     ovAlarmSrvPort="2953"
/>
```

Changes are visible in the NNM Alarms module each time the portal view is displayed or refreshed. The alarm lists are continually updated in SIP memory. NNM gathers alarms according to the filtering criteria specified in the alarm category's configuration file and forwards alarm data to SIP memory according to the OlderThanXMinutes parameter setting in each *NmAlarmCat*.xml file.

To create customized Alarms modules in your own portal view files, see *Presenting NNM Data* (Presenting_NNM_Data.pdf).

Enabling Network Device Health Module Access to NNM Data

HP OpenView Network Node Manager (NNM) collects all SNMP data requested by HP OpenView Service Information Portal (SIP) and provides current information about device status.

Network Device Health gauges calculate the health of specific network devices using information gathered by NNM management stations. Changes are visible in the SIP's Network Device Health gauges each time the portal view is displayed or refreshed.

SIP depends upon two programs that reside on each NNM management station (getnnmdata.exe and ovcolautoconf.exe) to collect requested data:

1. Each time a Network Device Health gauge is displayed, SIP logs the underlying data requests.

   A list of requested MIB objects and MIB expressions from any Network Device Health module gauge is compiled by SIP. The list documents which MIB objects and MIB expressions are being requested for which network devices from which NNM management stations.

NOTE   The underlying MIB objects and MIB expressions appear in Network Device Health gauge definitions as the Component elements' href attributes. Each href attribute must have a corresponding Metric element defined in the netHealthConfig.xml file that specifies exactly which MIB object or MIB expression is being requested.

2. SIP contacts the getnnmdata.exe on each NNM management station that is configured in the nmConfig.xml file. The frequency of this action is determined by the rawDataRefresh parameter setting in the netHealthConfig.xml file on the SIP server (by default, every 10 minutes).

3. SIP receives the most recent data collection results from the NNM database. SIP also places the current request log file in the `ovcolautoconf` directory. Requests from each SIP server are gathered here (`dc.needs<SIPserverIPaddress>`).

TIP   You must create the `ovcolautoconf` directory before this step works.

---

4. To complete the automatic configuration process, run the `ovcolautoconf.exe` command. The `ovcolautoconf` command must be executed on the NNM management station, either manually or as a scheduled task that you define. `ovcolautoconf` does the following:

   • All SIP servers' data collection needs are processed. The list of data collection requests is configured using the information in `snmpRepAuto.templ` file and placed in the `snmpRepPrev.conf` file.

   • If necessary, NNM's Data Collector configurations are updated by making SIP additions or changes to the `snmpRep.conf` file.

   • Data collections are configured on an *as-needed* basis, rather than a *potentially* needed basis. In other words, until a gauge is displayed in a portal view, no data collection is initiated. If a gauge is not displayed for 30 days (default setting), the data collections are discontinued.

5. The `snmpRep.conf` file is used by the SNMP Data Collector as a guide for gathering data. The entries from the HP OpenView Service Information Portal do not interfere with data collection configurations that were entered directly through NNM. The `ovcolautoconf.exe` deletes any data collection configurations that are no longer needed (provided they are not needed by other OpenView products). The collected data can be automatically trimmed from NNM's databases after it ages for one week (depending upon the settings in NNM's reporting feature).

TIP   If you are worried that SIP might modify critical data collections already defined on your NNM management stations, see "Manually Configuring NNM's Data Collector to Provide the Required SIP Data" on page 28.

On the SIP Server

1. Ensure that you set the `snmpDataSource` parameter, the `webSrvPort` parameter, and the `ovwdbPort` parameter in the `nmConfig.xml` file (Refer to "On the SIP Server" on page 18):

    ```
        <NNMStation
            hostname="mountain.rm.cnd.com"
            snmpDataSource="yes"
            alarmsDataSource="yes"
            symbolRegSource="yes"
            webSrvPort="80"
            ovwdbPort="2447"
            ovAlarmSrvPort="2953"
        />
    ```

On each NNM Management Station

1. Load the MIB Expressions (mathematical formulas using MIB values) that SIP uses during data collection. At the command prompt, type (no hard returns included):

    *   *Windows NT/2000:*

        **<NNM_install_dir>\bin\xnmcollect.exe -loadExpr
        <NNM_install_dir>\conf\ovcolautoconf\mibExprAuto.conf**

    *   *UNIX:*

        **/opt/OV/bin/xnmcollect -loadExpr
        /etc/opt/OV/share/conf/ovcolautoconf/mibExprAuto.conf**

    For more information about MIB Expressions, select `Help:Online Manuals-->Managing Your Network`.

NOTE　　　　　Continue with the remaining steps if you wish to enable *automatic* configuration of NNM's Data Collector to meet SIP data requirements. Otherwise, stop here and see "Manually Configuring NNM's Data Collector to Provide the Required SIP Data" on page 28.

---

2. Create the following directory. Make this directory writable by the web server process that you provided for SIP (such as apache's httpd on UNIX, or IIS on Windows) and the user responsible for running the ovcolautoconf command (see the next step):

- *Windows NT/2000:*

  <NNM_install_dir>\databases\snmpCollect**ovcolautoconf**

- *UNIX:*

  /var/opt/OV/share/databases/snmpCollect/**ovcolautoconf**

After a few minutes (10 by default), SIP populates this directory with the one or more dcNeeds.*SIPServerIPAddress* files containing the current list of data collection requests from open portal views on each SIP server. These files are created by getnnmdata.exe.

3. To update NNM's Data Collector configuration files, run ovcolautoconf on each NNM management station, either manually or as a scheduled task. At the command prompt, type one of the following:

ovcolautoconf **or**

ovcolautoconf -verbose

ovcolautoconf creates the snmpRepPrev.conf file in the ovcolautoconf directory. In this file all SIP requests are formatted so that they can be uploaded into NNM's Data Collector configuration files. This file is a record of the most recent configurations uploaded into the NNM snmpRep.conf file.

TIP

To change the number of days SIP waits before deleting any inactive data collection configurations (default 30), type the following command. There is no way to permanently change this setting. Include this command in your scheduled script or each time you manually run ovcolautoconf:
ovcolautoconf -maxConfAge #*ofdays*

4. You can modify the SIP collection configurations; for example, change collection intervals (15 minutes by default) or add thresholds. To modify the SIP collection configurations, edit the snmpRepAuto.templ file. This file is a template used by the ovcolautoconf program when formatting SIP data collection

requests for NNM's Data Collector program. It contains one entry for each MIB object or MIB expression upon which NNM's Data Collector needs to collect data.

To view the list of configured collections and make any necessary changes, at the command prompt type the following (no hard returns included):

- *Windows NT/2000*:
  xnmcollect -snmpColConfFile
  <*NNM_install_dir*>\conf\ovcolautoconf\snmpRepAuto.templ

- *UNIX*: log in as root and then type,
  xnmcollect -snmpColConfFile
  /etc/opt/OV/share/conf/ovcolautoconf/snmpRepAuto.templ

Review the list. In the *Source* field you will see the variable _NODE_, which is automatically replaced with any specific devices requested by SIP.

To create customized Network Device Health modules in your own portal view files, see *Presenting NNM Data* (Presenting_NNM_Data.pdf).

Manually Configuring NNM's Data Collector to Provide the Required SIP Data

The Network Device Health gauges that ship with SIP need NNM to configure data collections for several MIB expressions. MIB expressions are a feature of Network Node Manager that allow for the creation of mathematical formulas comprised of MIB objects. MIB expressions allow you to derive more meaningful information than you could gather from individual MIB objects.

The following MIB expressions are used by SIP. As long as you do not have MIB expressions by the same name, SIP data collections will not conflict with any current settings in the NNM Data Collector:

- p_if%util

- p_if%inerrors

- p_if%outerrors

- p_cisco5minavgbusy

To learn about the mathematical formulas in the SIP MIB expressions, complete step 1 on page 26, open NNM and select Options:Data

Collection & Thresholds, **select** Edit:MIB Object-->New, **then click on** Expressions. **The list of MIB expressions defined within NNM is displayed. Scroll down to the SIP MIB expressions, highlight one and click** [Describe].

NOTE   For interface metrics, different formulas are used depending upon the attributes of the interface (such as speed of the interface, half-duplex versus full-duplex, etc.). In the case of CPU utilization, the expression is really just a single Cisco MIB object: local.system.augBusy5. It is described as the "5 minute exponentially-decayed moving average of the CPU busy percentage."

To configure data collections based upon the SIP MIB expressions. Open NNM and select Options:Data Collection & Thresholds. **If you need more information, select the** Help:On Window. **See also, from any NNM submap, select** Help:Online Manuals-->Managing Your Network.

Selectively Disabling SIP Data Collection Configurations

You can selectively turn off the automatic data collections configuration for any SIP MIB expression. On the SIP server, open the netHealthConfig.xml file and search for the MIB expression (Metric) that you wish to modify.

For that particular Metric, **set the** autoConfig="no"

Now SIP requests the information for that Metric from the databases on your NNM management station, but does not modify the data collection settings within NNM.

Monitoring the Size of NNM's snmpCollect Database

The NNM snmpCollect database on the NNM management station grows without bounds unless you take precautions.

SIP-requested data collection data is automatically trimmed if NNM's reporting feature is in use on your NNM management station. (Check to see if one or more NNM Performance Reports are configured on the NNM system.) Open NNM and select Help:Online Manuals-->Reporting and Data Analysis for more information.

By default, data older than one week is deleted if the NNM Reporting feature is active.

See the *ovdwtrend* reference page in NNM's online help (or the UNIX manpage) for more information.

If Performance Reports are *not* active, the following command trims the data in the snmpCollect database. It can be run manually, or scheduled to run periodically, on the NNM system:

```
ovcoltosql -q -N -D <trim depth in hours> -exportset NNM_Reporting
```

For example, the following deletes all reporting/SIP data collector data in the snmpCollect database older than one week in age (there are 168 hours in 7 days):

```
ovcoltosql -q -N -D 168 -exportset NNM_Reporting
```

See the *ovcoltosql* reference page in NNM's online help (or the UNIX manpage) for more information.

Removing SIP Data Collection Configurations from NNM

If you want to remove SIP data collection configuration entries from NNM's Data Collector program, at the command prompt on the NNM management station, navigate to the ovcolautoconf directory and type the following:

```
xnmcollect -report -delete snmpRepPrev.conf
xnmcollect -event
```

Enabling Topology Module Access to NNM Data

Changes in network configuration and device status are visible in the NNM Topology module submaps each time the portal view is displayed or refreshed. NNM sends the most recent information to SIP upon demand.

If changes are made within NNM to the "Symbol Type" assigned to particular devices, SIP receives the changes according to the schedule established by the symbolFetchRateInMin attribute in the topologyConfig.xml file.

On the SIP Server

To display a submap in the out-of-the-box portal views provided with the SIP installation:

1. Ensure that you set the webSrvPort parameter and the ovwdbPort parameter in the nmConfig.xml file (Refer to "On the SIP Server" on page 18):

```
<NNMStation
     hostname="mountain.rm.cnd.com"
     snmpDataSource="yes"
     alarmsDataSource="yes"
     symbolRegSource="yes"
     webSrvPort="80"
     ovwdbPort="2447"
     ovAlarmSrvPort="2953"
/>
```

2. Open the following files within the SIP installation directory. Search and replace $LOCALHOST with the hostname of your NNM management station:

   • *Windows NT/2000:*

\<*SIP_install_dir*>\conf\share\views\samples\liveDemo.xml

\<*SIP_install_dir*>\conf\share\views\samples\technical.xml

\<*SIP_install_dir*>\conf\share\views\samples\business.xml

- *UNIX:*

```
/etc/opt/OV/SIP/conf/share/views/samples/liveDemo.xml
```

```
/etc/opt/OV/SIP/conf/share/views/samples/technical.xml
```

```
/etc/opt/OV/SIP/conf/share/views/samples/business.xml
```

3. **Open the default Topology module file and change $LOCALHOST to your preferred NNM management station:**

```
<!--   See OVTopology.dtd for more information   -->
<TopologyMap showStatus="yes" drillDown="no">
   <Submap href="ovw://$LOCALHOST/default/Internet"/>
</TopologyMap>
```

4. **If you wish to try out the topology drill-down feature that allows access to multiple NNM submaps by double-clicking on map symbols in the SIP portal view, change the** `drillDown` **parameter in the topology module as follows:**

   ```
   <TopologyMap drillDown="yes" showStatus="yes">
   ```

TIP

If you set `drillDown="yes"`, only submaps that are *persistent* can be accessed unless you open the `topologyConfig.xml` file and set the `loadTransientSubmaps` attribute to `"yes"`.

5. *WindowsNT/2000*:
   From the `Control Panel`, **select** `Services`. **Stop and then restart** `Tomcat`. **Alternatively, you can use the command line:** **net stop tomcat** and **net start tomcat**.

   UNIX:

   As `root`, **stop and restart the web server and servlet engine by running the following. (The** `DISPLAY` **variable must be configured prior to restarting the webserver and servlet engine.)**

   Stop on HP-UX: **/sbin/init.d/ovsip stop**
   Start on HP-UX: **/sbin/init.d/ovsip start**

   Stop on Solaris: **/etc/init.d/ovsip stop**
   Start on Solaris: **/etc/init.d/ovsip start**

6. **If you wish to view submaps from multiple NNM management stations or collection stations, simply copy and paste the** `Submap`

element multiple times, one for each NNM management station. Replace one $LOCALHOST entry with each NNM management station hostname. This line specifies the *NNM management station name*, the *default* map, and the *Internet* submap:

```
<Submap href="ovw://$LOCALHOST/default/Internet"/>
```

To create customized Topology modules in your own portal view files, see *Presenting NNM Data* (Presenting_NNM_Data.pdf).

On each NNM Management Station

1. Open NNM (ovw) on the NNM management station containing the map you wish to display in a SIP portal view:

TIP   Check the following file for information about running NNM in a virtual window so that you don't have to keep every SIP map open in an ovw session: /htdocs/WhitePapers/VirtualWindow-NNM.html

Windows NT/2000:

- Start the NNM services (if necessary) by clicking
  ```
  Start:Programs->HP OpenView->
  Network Node Manager Admin->NNM Services-Start.
  ```

- Start the NNM interface by clicking `Start:Programs->` `HP OpenView->Network Node Manager.`

UNIX:

- To start the NNM background processes, log in as root and type:

  /opt/OV/bin/ovstart -c

- To start the NNM interface, type:

  /opt/OV/bin/ovw

2. Open the *default* map on the NNM management station that you specified in the out-of-the-box portal views provided with the SIP installation, "On the SIP Server" on page 31.

3. Ensure that the Internet submap is displayed or set to *persistent* (stored in RAM, not *transient* -- generated upon request). To check or change persistence, do one of the following:

- Configure the IP Map application to enable the on-demand level:

  Windows NT/2000:`Map:Properties`. **From the** `Applications` **tab, double click on IP Map and select an** `On-Demand` **level.**

  UNIX: `Map:Properties`. **Select IP Map, click the [**`Configure For This Map`**] button, and select an** `On-Demand` **level.**

- Make the individual submap persistent:

  Windows NT/2000:`Map:Submap:Properties`. **From the** `View` **tab, select the** `Persistent` **check box.**

  UNIX: `Map:Submap:Make the Submap Persistent`.

4. If the NNM management station is restarted, you must restart each NNM session to display the submaps in the SIP portal views.

To create customized Topology modules in your own portal view files, see *Presenting NNM Data* (`Presenting_NNM_Data.pdf`).

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