

HP Network Node Manager i-series Software System and Device Support Matrix

Software Version: 8.12 / June 30 2009

This document provides an overview of the system requirements and supported devices for HP Network Node Manager i-series Software version 8.12.

For the latest additions to the system requirements and device support, see sg-pro-ovweb.austin.hp.com/nnm/NNM8.10/supportmatrixupdate.htm

This document is intended to augment the *Release Notes*.

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Installation Guide

Pre-installation requirements, as well as instructions for installing NNMi, are documented in the installation guide provided in Adobe Acrobat (.pdf) format. The document file is included on the product's installation media as: `install-guide_en.pdf`. After installation, this document can be found from the NNMi console by selecting `Help` → `Documentation Library` → `Installation Guide`.

Hardware and Software Requirements

Before installing Network Node Manager, make sure that your system meets the following minimum requirements:

Hardware

- Intel 64-bit (x86-64) or AMD 64-bit (AMD64)
 - Caution: Intel 32-bit (x86) hardware is not supported. Verify your computer architecture by looking at the `%PROCESSOR_ARCHITECTURE%` variable or *System Properties*.
- Itanium Processor Family
 - Caution: IPF hardware running the Windows or Linux operating systems is not supported
- Sun UltraSPARC
 - NNM supports the following Solaris processors: UltraSPARC IIIi, IV, and IV Plus. NNM does not support the following Solaris T series processors: UltraSparc T1, T2, and T2 Plus.
- VMWare ESX Server 3.x
 - Virtual environment must meet the x86-64 or AMD64 hardware requirements listed here

CPU, RAM, and Disk Space Requirements / Maximum Supported Managed Environment

Below are the three tiers of managed network environments and the hardware requirements for supporting those environments. These values are approximate and reflect levels tested by HP. If you have a particularly complex environment, you may want to provision more powerful hardware as indicated by the next higher tier. The number of currently discovered Nodes and polled Interfaces is displayed in the NNMi "Help → About HP Network Node Manager i-series" dialog. Managed environments bigger than the Large tier are not supported without additional HP approval.

Managed Environment Size						NNM Minimum Hardware System Requirements				
Approximate managed environment tier	Number of discovered Nodes	Number of discovered Interfaces*	Number of polled Interfaces*	Number of polled Node Components	Number of concurrent users	CPU (64-bit) IPF x86-64 AMD64 SPARC	RAM	Java heap size (see Tuning the jboss Memory Size, below)	Disk space for application installation (<NnmInstallDir>)**	Disk space for database and data during execution (<NnmDataDir>)***
Small	Up to 3K	Up to 120K	Up to 10K	Up to 40K	Up to 10	4 CPU cores (2.5GHz for x64; 1.4GHz for IPF or RISC)	4 GB	4 GB (-Xmx4096m)	5 GB	60 GB
Medium	3K – 8K	Up to 400K	Up to 50K	Up to 60K	Up to 25	4 CPU cores (2.5GHz for x64; 1.4GHz for IPF or RISC)	16 GB	6 GB (-Xmx6g)	5 GB	140 GB RAID 1+0 or 5/6 with write cache recommended (4 disk)
Large	8K – 18K	Up to 900K	Up to 70K	Up to 80K	Up to 40	8 CPU cores (2.5GHz for x64; 1.4GHz for IPF or RISC)	24 GB	10 GB (-Xmx10g)	5 GB	300 GB RAID 1+0 or 5/6 with write cache recommended (4 disk)

* Maximum number of discovered Interfaces does not affect performance, it only affects the size of the database. Monitoring performance is affected by the number of Interfaces (and Node Components) being polled by the State Poller. The "Number of Polled Interfaces" reflects the number of Interfaces polled in a 5 minute interval. To view the number of polled objects, examine the Monitored Objects count in the "Help → About HP Network Node Manager i-series" dialog.

** <NnmInstallDir> is configured during installation on Windows (C:\Program Files (x86)\HP\HP BTO Software\ by default), or on UNIX by creating a symlink to /opt/OV. NOTE to NNM 7.x customers: /etc/opt/OV is no longer used on UNIX.

*** <NnmDataDir> is configured during installation on Windows (C:\Documents and Settings\All Users\Application Data\HP\HP BTO Software by default), or on UNIX creating a symlink of /var/opt/OV. Disk space estimates are when using embedded PostgreSQL. If using an external Oracle database, only 10-20 GB is required for NnmDataDir.

These recommendations only apply to NNMi running under the default settings. If you intend to run any of the NNM iSPIs, please review each iSPI support matrix before determining the hardware you need. NNM iSPIs may require additional hardware beyond what NNMi requires. If you are running additional applications, please increase resources appropriately.

Suggested Partitioning on UNIX Platforms

The following is a suggested partitioning on UNIX platforms. Please increase the size of /var/opt/OV for larger disks:

- / - 5GB
- /tmp - 1GB
- /var/tmp - 1GB

- /etc/opt/OV - 1GB
- /opt/OV/ - 5GB
- /var/opt/OV - Remainder of disk

Operating System

- Windows
 - Windows Server 2003 x64 with Service Pack 2
 - Windows Server 2003 x64 R2 with Service Pack 2
 - Caution: Windows operating systems on Itanium Processor Family (IPF) are not supported
 - Caution: Windows 32-bit operating systems are not supported
 - Other Windows Software
 - Microsoft Simple Network Management Protocol must be installed (see [Install Guide](#))
- HP-UX
 - HP-UX 11iv3
 - Kernel configuration (verify with `/usr/sbin/smh`)
 - Verify kernel parameters in the "Kernel Configuration/Tunables" section:
 - nproc: add 50
 - max_thread_proc = 2048
 - nkthreads = 10000
 - System Configuration
 - Verify using swapinfo that the system has a sufficient amount of swap as documented above.
 - Operating System Kernel Patches

The following HP-UX 11iv3 operating system patches are required (or newer if the patch has been superseded). You can verify patches on HP-UX by running

```
/usr/sbin/swlist -l fileset -a patch_state *.*c=patch | grep -v superseded
```

This list does not include Java patches (see next bullet), but only the list of OS-level patches. The following patches are required:

 - PHKL_36054
 - PHKL_36261
 - PHKL_36872
 - PHKL_37184
 - Run *HPjconfig HP-UX 11i system configuration tool* to validate the system configuration. HPjconfig can be downloaded from www.hp.com/go/java. To install:
 - On your HP-UX system, gunzip and untar the .tar.gz file as follows:


```
gunzip HPjconfig-3.1.00.tar.gz
tar -xvf HPjconfig-3.1.00.tar
```
 - To start HPJconfig:

Change to the directory where you installed the HPjconfig files.

There are two ways you can run HPjconfig, GUI and non-GUI mode. Enter one of the following commands:

```
java -jar ./HPjconfig.jar (The default HPjconfig GUI)
```

```
java -jar ./HPjconfig.jar -nogui -help
```

(The -help command lists options that you can use in non-GUI mode.)

- o To list missing patches in non-GUI mode:

```
java -jar ./HPjconfig.jar -nogui -patches -listmis
```

This command validates the kernel configuration and patch levels.

- Solaris

- Sun Solaris 10 SPARC
- Caution: Solaris on Intel Architecture is not supported
- The shared memory must be updated. Update the /etc/system entry using an editor as follows:
set shmsys:shminfo_shmmax=1073741824

- Linux

- RedHat Enterprise Server AS 4.6 (or newer minor version)
- RedHat Enterprise Server ES 4.6 (or newer minor version)
- The default size of kernel.shmmax may be too small for the embedded database to operate after a reboot (as reported by ovstatus -c nmsdbmgr). To validate, run /sbin/sysctl -a | /bin/grep kernel.shmmax. If this is less than 300 Meg (300000000), then it must be modified. To change the value, run:
/sbin/sysctl -w kernel.shmmax=300000000
To make this change permanent (after a reboot), edit the /etc/sysctl.conf file and add the following entry:

```
kernel.shmmax = 300000000
```

- See the installation guide for the dependency on the 64-bit libstdc++ libraries.
- Red Hat Enterprise Linux 5.2

NNMi 8.12 supports Linux Red Hat 5.2 after the following configuration steps. The configuration includes steps before NNMi 8.10 product installation, after installation, and before patch installation. Firewall configuration might be required.

Do the following steps in order:

- Set SELinux to either disabled or permissive. Either edit the /etc/sysconfig/selinux file or use the System → Administration → SELinux Management tool.

- Install the NNMi 8.10 product.

- After NNMi 8.10 installation is complete, run the following command:

```
chcon -t textrel_shlib_t /opt/OV/lib/*
```

Error messages, such as those shown here, from the chcon command can be safely ignored:

```
chcon: /opt/OV/lib/libxaLan-c.so.18: No such file or directory
chcon: /opt/OV/lib/libxaLanMsg.so.18: No such file or directory
chcon: /opt/OV/lib/libxerces-c.so.25: No such file or directory
```

- Restore SELinux to the previous value.
- A firewall may block access to the NNMi console, NNM iSPIs, and NNMi application failover. If you have problems accessing these functions, the firewall might be active and blocking access. Ensure that the following ports are opened to gain full access to NNMi and NNM iSPI functionality:

Port Name	Default Value	Comments
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jboss.http.port	80/tcp	If the port number is changed from 80, the port might be blocked by the firewall. The NNMi console will not work. If a different port number was specified during installation, that port needs to be opened instead of 80.
jboss.ejb3.port	3873/tcp	If iSPiS are being used, this port must be made accessible to remote systems running iSPiS.
Application Failover Port	45588/udp	This port must be unblocked if application failover is used.
SNMP Ports	161/udp, 162/udp	These ports must be unblocked for NNMi to receive traps.

- After completing all of the previous configuration steps, install the latest consolidated NNMi patch.

Virtual Memory/Swap Space

- Recommended size is at least equal to physical memory.
- Verify virtual memory by using the `swapinfo` command on HP-UX, the `swap` command on Solaris, the `cat /proc/meminfo | grep Swap` command on Linux, or *System Properties* on Windows.
- Adjust virtual memory by using the `shm` or `swapon` command on HP-UX, the `swap` command on Solaris, the `parted` and `mkswap` command on Linux, or *System Properties* on Windows.

High Availability

NNMi can run on certain high availability systems with additional configuration. Please see the [Deployment Guide](#) for information on how to install and configure NNMi with high availability systems. The following configurations are supported on [NNMi Supported Operating Systems](#):

- Microsoft: Microsoft Cluster Services 2003
- HP-UX: Service Guard - 11.18 and above
- Linux: Service Guard - 11.18 and above
- Solaris: Veritas 5.0

Database

NNMi can store its data using an embedded database that is automatically installed, or in an Oracle database. Oracle as a database must be chosen at installation time.

NOTE: You cannot migrate from an embedded database to Oracle or back.

- Embedded database on the management system
 - The embedded database is automatically installed and automatically initialized and maintained by NNMi
 - The embedded database comes with tools for re-initialization, online backup, and restore
 - The embedded database performs well for most deployments
- Oracle 10g Release 2 (10.2.0.x) installed on a remote system
 - Recommend at least a 1GB network connection between the NNMi management server and the database server
 - Database user must be created before install (see [Install Guide](#)) with appropriate tablespace

Web Browser

- General Web Browser Requirements

- Any Window Popup Blockers must be disabled for the browser (see instructions on the NNMi console sign-in page or [Install Guide](#))
- Cookies must be enabled for the browser (see instructions on the NNMi console sign-in page or [Install Guide](#))
- Client display should have a resolution of at least 1024x768
- Caution: The following browsers are not supported:
 - Microsoft Internet Explorer version 6 (browser causes layout problems)
 - Microsoft Internet Explorer version 8
 - Apple Safari (all versions)
 - Opera (all versions)
 - Google Chrome (all versions)
- Web Browser Running on a Remote Client System (for operational use)
 - Microsoft Internet Explorer version 7.0.5730.11 or newer with October 2007 or later Cumulative Patch for Internet Explorer 7. This patch increases the number of Internet Explorer cookies from 20 to 50 which enables saving more NNMi console table configurations.
 - Mozilla Firefox version 3.0.10 or newer minor version from a Windows or Linux client. The Firefox browser may be downloaded from www.mozilla.org/firefox.
 - Mozilla Firefox version 2.0.0.18 or newer minor version from a Windows or Linux client. The Firefox browser may be downloaded from www.mozilla.org/firefox.
- Web Browser Running on the Local Management Server System (for initial installation and configuration use)
 - Any browser supported for operational use (see above) when running on the management server
 - Mozilla Firefox version 2.0.0.4 or newer minor version for HP-UX 11.31 on IPF server. The Firefox browser may be downloaded from www.hp.com/go/firefox
 - Mozilla Firefox version 2.0.0.9 or newer minor version for Solaris SPARC 10. The Firefox browser may be downloaded from releases.mozilla.org/pub/mozilla.org/firefox/releases/2.0.0.9/contrib/solaris_pkgadd/

Tuning the jboss Memory Size

During installation, the recommended default maximum memory size of the jboss application server is configured in `ovjboss.jvm.properties`. For larger environments this value can be increased to improve performance as documented above in [CPU, RAM, and Disk Space Requirements](#). The current Maximum Attemptable Memory value (adjustable through `-Xmx`) and a memory region report are available in the NNMi console with "Help → About HP Network Node Manager i-series". It is recommended that this `-Xmx` value not exceed one-half of the amount of physical RAM. Do not make this `-Xmx` value too large; otherwise the operating system will thrash as jboss accesses memory. For more information about tuning the Java 5.0 JVM, see java.sun.com/docs/hotspot/gc5.0/gc_tuning_5.html.

NNMi monitors the jboss memory regions during operation. If jboss is getting low on memory resources, a message appears on the NNMi console sign-in page, the bottom of the NNMi console, and at the top of forms. Some of the possible memory region messages and suggested fixes include:

- [Critical] The region 'PS Old Gen' is at 100.00% usage
Fix by increasing the `Xmx` value in `ovjboss.jvm.properties`
- [Critical] The region 'Tenured Gen' is at 100% usage
Fix by increasing the `Xmx` value in `ovjboss.jvm.properties`
- [Major] The region 'PS Perm Gen' is at 92.66% usage
[Critical] The region 'Perm Gen' is at 96.32% usage
Perm Gen memory area is the area used for on-demand loading of Java classes. PS Perm Gen is the name of the memory area used with multi-cpu systems. This warning can happen if additional NNMi functionality has been added or if components have been redeployed. Fix by restarting `ovjboss`. If the problem continues, fix by increasing the `XX:MaxPermSize` such as changing `XX:MaxPermSize=128m` to `XX:MaxPermSize=256m`

To change the jboss Maximum Java Heap Size (Xmx) or other Java Virtual Machine parameters:

1. `ovstop -c ovjboss`
2. Edit the `ovjboss.jvm.properties` file:
 - **Windows:** `C:\Documents and Settings\All Users\Application Data\HP\HP BTO Software\shared\nnm\conf\ovjboss\ovjboss.jvm.properties`
 - **UNIX:** `/var/opt/OV/shared/nnm/conf/ovjboss/ovjboss.jvm.properties`
3. Change the Maximum Java Heap Size to the required amount. For example, a snippet of the `ovjboss.jvm.properties` file looks like this:


```
#
# JVM Memory parameters
# Xms: Initial Java Heap Size
# Xmx: Maximum Java Heap Size
#
Xms128m
Xmx2048m
```
4. `ovstart -c ovjboss`

Internationalization and Localization Support

NNMi 8.10 is internationalized and can be used on operating systems configured for non-US-English locales that are supported by the operating systems. Those locales include variants of Japanese, Korean, Simplified Chinese, and Traditional Chinese, and Western and Central European locales, and Russian.

NNMi is localized (or translated) to Japanese, Simplified Chinese, and Korean, and hence, when those localized packages are installed, Japanese, Simplified Chinese, or Korean translations will be displayed (as output) in addition to accepting non-English characters as input. With all other locales, English strings will appear while accepting non-English characters as input.

The localized language and supported Locale for each operating system is listed below.

Operating System	Localized Languages		
	Japanese	Korean	Simplified Chinese
Windows	Japanese	Korean	Chinese_PRC
HP-UX	ja_JP.SJIS ja_JP.eucJP	ko_KR.eucKR	zh_CN.hp15CN
Solaris	ja_JP.PCK ja_JP.eucJP	ko	zh
Linux	ja_JP	ko_KR	zh_CN

NOTE: NNMi console features that have been added to NNMi since the 8.10 release have not been translated and are, therefore, available only in English at this time.

If you plan to use Internet Explorer to access an NNMi management server that is configured to support the Asian Languages, you need to install the East Asian Language. To install the East Asian Language, use the following procedure:

1. Open the Control Panel.
2. Select Regional and Language Options.
3. Select the Languages tab.
4. Select Install files for East Asian Languages and follow the instructions.

Integration and Coexistence with Other Products

NNM i-series Smart Plug-ins

The following Smart Plug-ins (iSPIs) are available to add on to NNMi 8.10:

- HP Network Node Manager iSPI for Performance version 8.10
- HP Network Node Manager iSPI Network Engineering Toolset version 8.10
- HP Network Node Manager iSPI for IP Telephony version 8.10
- HP Network Node Manager iSPI for IP Multicast version 8.10
- HP Network Node Manager iSPI for MPLS version 8.10

Co-existence

The following products have been tested to co-exist on the same system as NNMi 8.10:

- HP Operations Agent (OMW 64 bit https Agent) Version 8.x (Windows Server 2003 Enterprise x64 R2 Service Pack 2 only)
- HP Operations Agent (OMU 64 bit https Agent) Version 8.x (HP-UX 11.31 IPF, Solaris 10 SPARC)
- HP Performance Insight Version 5.31 (HP-UX 11.31 IPF, Solaris 10 SPARC)

Caution: The "mibbrowser" command available in OVPI 5.3 will not work if NNMi 8.10 is installed on the same system as OVPI. Please contact HP support to obtain a patch for this problem.

Caution: NNMi to OVPI Node Sync functionality requires OVPI patch 5.31.001

- HP Performance Agent Version 4.7 (Windows Server 2003 Enterprise x64 SP2, Windows Server 2003 Enterprise x64 R2 Service Pack 2)
- HP Performance Manager Version 8.0 (HP-UX 11.31 IPF, Solaris 10 SPARC)

Caution: Installation of HP Performance Manager followed by NNMi 8.10 is supported. Installation of NNMi 8.10 followed by HP Performance Manager is not supported.

Caution: If HP Performance Manager is installed, followed by NNMi 8.10, then HP Performance Manager is uninstalled, the HPOvPerIA package must be reinstalled using the appropriate OS command:

- Solaris:

```
pkgadd -d <full path to HPOvPerIA sparc package>/HPOvPerIA-05.08.081-SunOS5.7-release.sparc
```

- HP-UX:

```
swinstall -s <full path to HPOvPerIA depot package>/HPOvPerIA-05.08.081-HPUX11.22_IPF32-release.depot \*
```

- HP Extensible SNMP Agent Version 4.21 (HP-UX 11.31 IPF, Solaris 10 SPARC)

Integrations

The following products have additional functionality available through an NNMi 8.10 integration:

- HP Network Node Manager Versions 6.x and 7.x (Integration built into NNMi. See "NNM 6.x/7.x Management Stations" in the online help)
- HP Network Automation Version 7.20, 7.21, or 7.50
Caution: The integration between NNMi and HP NA 7.50 requires the HP NA 7.50.01 patch.

- HP Performance Insight Version 5.31
- HP Business Availability Center Version 7.50
- HP Operations Manager for Windows Version 8.10
- HP Operations Manager for UNIX Version 8.30
- HP UCMDB Version 7.00 with patch or UCMDB Version 7.50
- HP Route Analytics Management System Version 8.01 (requires an NNMi Advanced license)
- HP Operation Orchestration Version 7.20
- NetScout nGenius Version 4.3 with patch or nGenius Version 4.5
- AlarmPoint Systems AlarmPoint Express Version 4.0

Supported Network Devices

This device support information is based on the latest information available to HP at the time of publication. Note that device vendors can at any time alter a device's MIB usage (for example, in newer IOS or system software versions) and invalidate NNM's interpretation of that device's MIB data. For the latest updates to the device support matrix, see sg-pro-ovweb.austin.hp.com/nnm/NNM8.10/devicematrix.htm.