HP Network Automation Support Matrix

Software Version 9.11 / October 2012
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This document provides an overview of the system requirements and supported platforms for HP Network Automation, Version 9.11.

Installation Guide

Pre-installation requirements, as well as instructions for installing HP Network Automation, are documented in the *HP Network Automation 9.10 Upgrade and Installation Guide* provided in Adobe Acrobat (.pdf) format.

The document file is included on the product's installation media as: `installation_and_ugrade_guide.pdf`. After installation, the document can be found from the main menu by selecting `Help --> Documentation --> HP Network Automation 9.10 Upgrade and Installation Guide`.

To check for recent updates, or to verify that you are using the most recent edition of a document, go to: http://h20230.www2.hp.com/selfsolve/manuals.

HP Network Automation Supported Devices Matrix

To access the *NA Supported Devices Matrix*, view the *Supported Devices- NA 7.x and later* document on the HP Live Network web site:

https://hpln.hp.com/node/19/contentfiles?dir=2258

(under Driver Packs > Documentation)

Access to this page requires an HP Live Network user account.

Hardware and Software Requirements

Before installing HP Network Automation 9.10, make sure that your system meets the following minimum requirements.

Hardware Requirements

Intel Xeon or equivalent, 3.0+ GHz (Windows, Linux)
Dual UltraSparc IIIi+, 1.3 GHz (Solaris)

Maximum Supported Managed Environment

NA 9.11 has been tested at scale for several NA deployment tiers. For each tier, the number of tasks for that tier ran to completion within a 24 hour period for the associated hardware environment described in CPU, RAM, Swap Space, and Disk Space Requirements on page 6.

With the exception of Microsoft SQL Server running on a Windows operating system, all tests were run on a RedHat Linux operating system. All tests were run with the NA servers and database servers in the same physical location, resulting in near zero latency.

Table 1 and Table 2 describe the tested managed environment for each tier.

- The rows in Table 1 define the test environment for each tier.

- The rows in Table 2 define the tested NA deployment architecture for each tier.

To select the appropriate tier for your environment, follow these steps:

1. For each row in Table 1, determine the current value for your managed environment, and then add an amount that estimates the growth of your network over the next two years.

2. For each row in Table 1, identify the managed environment size (column) that contains the values determined in step 1.

   If the managed environment matches two different tiers, provision the higher tier. For example, a managed environment with 3k devices and 20k tasks per day fits into the medium environment size.

3. Choose a deployment architecture from the correct column in Table 2.

   For specific system requirements for the deployment architecture, see the table referenced in the last row of Table 2.

Table 1   Managed Environment Size

Factor	Small	Medium	Large
Number of Managed Devices	Up to 3k	Up to 10k	Up to 50k
Number of Tasks Per Day[1]	Up to 12k	Up to 45k	Up to 200k

1. This number includes both scheduled tasks and ad hoc tasks resulting from detected configuration changes. Scheduled tasks were distributed to start throughout the day.

Table 2   Deployment Architecture

Factor	Small	Medium	Large
Minimum Number of NA Cores	1 NA core	1 NA core	• 2-5 NA cores connected to a single database with NA Horizontal Scalability • 1 NA core per 10k managed devices or 40k tasks,
Database	• Size <250 GB[1]: Embedded MySQL • Size >250 GB: Remote Oracle or Microsoft SQL Server	Remote Oracle or Microsoft SQL Server	Remote Oracle
For system requirements, see:	Table 3 on page 6	Table 4 on page 7	Table 5 on page 8

1. For information about predicting database size, see Approximating Database Size (MySQL only) on page 5.

Approximating Database Size (MySQL only)

For MySQL, the size of the NA database can be approximated as follows:

2 * (average device configuration size) * (number of configuration records)

The average device configuration size must be determined specifically for the managed devices in your network.

The number of configuration records can be estimated by using one of the following approaches:

- The average number of device configurations changed every day multiplied by the number of days in the data retention period:

    (average device configuration changes per day) * (days in retention period)

    For example, for a network with 3000 devices, five percent of which are updated daily, and a one year retention period, the expected number of configuration records is 54,750. The calculation is as follows:

    (5% * 3000) * 365 = 54,750

- The number of devices multiplied by the average number of device configuration changes during the data retention period:

    (number of devices) * (average device configuration changes for the retention period)

    For example, for a network with 3000 devices, each of which is updated once every three weeks, and a one year (52 week) retention period, the expected number of configuration records is 52,000. The calculation is as follows:

    3000 * (52/3) = 52,000

CPU, RAM, Swap Space, and Disk Space Requirements

The tables in this section describe the supported hardware environment for each of the tested managed environment tiers defined in Maximum Supported Managed Environment on page 3.

To determine the system requirements for your environment, see the table associated with the tier you selected in Table 1. This section includes the following information:

- Table 3, Small Tier System Configuration Requirements
- Table 4, Medium Tier System Configuration Requirements
- Table 5, Large Tier System Configuration Requirements

For additional information about sizing and configuring the database server, consult the database manufacturer's documentation.

Table 3   Small Tier System Configuration Requirements

Server	CPU	Memory	Swap Space	Disk Space
Separate Application Server	1 physical CPU with 6 cores and 12 logical (virtual) processors with hyper-threading	16 GB RAM	16 GB[1]	40 GB
Separate Database Server (Oracle or SQL Server only)	2 physical CPUs with 12 cores and 24 logical (virtual) processors	16 GB RAM	16 GB	512 GB, Fibre Channel hard disk drive
Combined Application Server and Database Server (MySQL only)	1 physical CPU with 6 cores and 12 logical (virtual) processors with hyper-threading	32 GB RAM	16 GB	512 GB, Fibre Channel hard disk drive

1. NA on a Solaris system requires a large amount of swap space because of the way the `fork()` system call works. For example, forking a 24 GB process allocates 24 GB in the swap file, which guarantees space to swap out the new process if necessary. If the 24 GB is not available in swap, the `fork()` system call fails.

Table 4   Medium Tier System Configuration Requirements

Server	CPU	Memory	Swap Space	Disk Space
Separate Application Server	2 physical CPUs with 12 cores and 24 logical (virtual) processors	32 GB RAM	16 GB[1]	256 GB
Separate Database Server	• Oracle: 2 physical CPUs with 12 cores 24 logical (virtual) processors • SQL Server: 2 physical CPUs with 8 cores and 16 logical (virtual) processors	32 GB RAM	16 GB	• Oracle: 600 GB, Fibre Channel hard disk drive • SQL Server: 400 GB, Fibre Channel hard disk drive

1. NA on a Solaris system requires a large amount of swap space because of the way the `fork()` system call works. For example, forking a 24 GB process allocates 24 GB in the swap file, which guarantees space to swap out the new process if necessary. If the 24 GB is not available in swap, the `fork()` system call fails.

Table 5   Large Tier System Configuration Requirements

Server	CPU	Memory	Swap Space	Disk Space
Separate Application Server	2 physical CPUs with 8 cores and 16 logical (virtual) processors per NA server	32 GB RAM per NA server	16 GB per NA server[1]	256 GB per NA server
Separate Database Server	2 physical CPUs with 12 cores and 24 logical (virtual) processors	48 GB RAM	16 GB	Depends on managed device count: • .6 TB for 10k devices • .9 TB for 20k devices • 1.2 TB for 30k devices • 1.5 TB for 40k devices • 1.7 TB for 50k devices

1. NA on a Solaris system requires a large amount of swap space because of the way the `fork()` system call works. For example, forking a 24 GB process allocates 24 GB in the swap file, which guarantees space to swap out the new process if necessary. If the 24 GB is not available in swap, the `fork()` system call fails.

Network Requirements

When the application and database servers are different systems, the servers should be in the same geographical location (data center), and the network interface cards (NIC) for the connection between the servers must be full duplex with speed of at least 1 Gb/s.

Port Utilization

HP Network Automation communicates with devices using a combination of protocols and ports. If you use a given protocol, HP Network Automation requires access to the corresponding port. Specifically, if HP Network Automation communicates with devices protected by firewalls, these ports must be open, or you must use an alternative means of communication, such as a HP Network Automation Satellite server. Refer to "Appendix B, Troubleshooting," in the *HP Network Automation 9.10 Upgrade and Installation Guide* for information on allocating ports.

Operating Systems

The following table specifies the application architecture available on the supported operating systems for NA Core and NA Satellite installations.

Operating System	Architecture	32-bit	64-bit[1]	Satellite
Windows Server 2008 R2 with SP1	x86_64		X	
Windows Server 2003 with SP2	X86_32	X		
Solaris 10 SPARC[2, 3]	Sun4u, SUN4v		X	X
RedHat RH AS 4[4]	x86_32	X		X
RedHat RHEL Server 5	x86_64		X	X
SuSE Enterprise Linux Server 10[5]	x86_64		X	
SuSE Enterprise Linux Server 11 SP2	x86_64		X	

Notes:

1. New installations of HP Network Automation 9.10 must be performed on a supported 64-bit architecture. Upgrades from NA 7.5x, 7.6x, or 9.0x to NA 9.10 must maintain the existing architecture. For example, 32-bit NA 7.60.02 can be upgraded to 32-bit NA 9.10 while 64-bit NA 7.60.02 can be upgraded to 64-bit NA 9.10.

2. Before installing HP Network Automation 9.10 on a Solaris 10 platform, you must reconfigure the Syslog server on Solaris 10 to not listen for remote Syslog messages.

3. A large amount of swap space is required because of how the *fork()* system call works on Solaris. When you fork a 24 GB process, Solaris allocates 24 GB in the swap file. This guarantees that if the new process needs to be swapped out, it can be. If the 24 GB is not available in swap, the *fork()* system call fails.

4. RedHat RH AS 4 is supported for upgrades from HP Network Automation 7.5x, 7.6x, or 9.0x. For new installations of HP Network Automation 9.10, use a supported 64-bit platform such as RedHat RHEL Server 5.

5. SuSE Enterprise Linux Server 9 is supported for Satellite environments.

Note: RSA device authentication is available on Windows 2003, 32-bit only.

Tuning Settings

JCS Disk Cache

It is recommended to disable the JCS disk cache as described in "Disabling the JCS Disk Cache" in the *NA Administration Guide*.

Java Virtual Machine Configuration

For all managed environment tiers, the recommended Java virtual machine (JVM) configuration is:

- Initial Java heap size: at least 8 GB (8192)
- Maximum Java heap size: the same value as the initial Java heap size
- Young generation size: one-third of the initial Java heap size

For information about how to configure the NA JVM, see "Configuring the Java Virtual Machine" in the *NA Administration Guide*.

Maximum Concurrent Tasks

Table 6 lists the recommended configuration for maximum concurrent tasks depending on the managed environment tier.

Table 6   Recommended Setting for Maximum Concurrent Tasks

Managed Environment Size	Maximum Concurrent Tasks
Small	20
Medium	65
Large	65 on each NA core

For information about how to configure the maximum concurrent tasks value, see "Tuning the NA Management Engine" in the *NA Administration Guide*.

MySQL

It is recommended to configure MySQL to use an unlimited number of threads. For more information, see "Configuring MySQL for NA" in the *NA Administration Guide*.

Oracle

It is recommended to configure the maximum number of processes, sessions, and transactions for the Oracle database relative to the maximum number of concurrent tasks for NA. For more information, see "Configuring Oracle for NA" in the *NA Administration Guide*.

SQL Server

At this time, there is no recommended tuning for Microsoft SQL Server with NA.

Supported Databases

See the appropriate section for your environment:

- Databases for Standalone NA Core on page 13
- Databases for Multimaster Distributed System on page 15
- Databases for Horizontal Scalability on page 16

Databases for Standalone NA Core

When installing HP Network Automation 9.10, the database can be installed on any platform. The following table describes the supported databases for a standalone NA Core environment.

Standalone NA Core - Supported Databases

Database Version	Supported NA Versions	Notes
Oracle 10g R2 (10.2.0.2 or 10.2.0.4) Standard or Enterprise Edition	9.10 with or without patches	64-bit Oracle is supported.
Oracle 10g R2 (10.2.0.5) Standard or Enterprise Edition	9.10.02 or the latest consolidated patch	
Oracle 11g R1 (11.1.0.7) Standard or Enterprise Edition	9.10 with or without patches	
Oracle 11g R2 (11.2.0.1) Standard or Enterprise Edition	9.10 with or without patches	
Oracle 11g R2 (11.2.0.2) Standard or Enterprise Edition	9.10.02 or the latest consolidated patch	
Oracle 11g R2 (11.2.0.3) Standard or Enterprise Edition	9.11 or later	
Oracle RAC on Oracle 11g R2 (11.2.0.1) Standard or Enterprise Edition	For 9.10.01 or later, new installations of NA only	
Microsoft SQL Server 2005 Standard or Enterprise Edition	9.10 with or without patches	64-bit Microsoft SQL Server is supported.
Microsoft SQL Server 2008 Standard or Enterprise Edition	9.10 with or without patches	
Microsoft SQL Server 2008 R2 Standard or Enterprise Edition	9.11 or later	
MySQL 5.0.58	9.10 with or without patches	The supported version of MySQL ships with NA.

Except for modest deployments without full enterprise scale and performance requirements, the application server and database server should be on separate physical machines. In addition, the database server should be dedicated to HP Network Automation 9.10, rather than serving multiple applications.

Note: HP Network Automation does not support the use of Microsoft SQL Server Named Instances.

Databases for Multimaster Distributed System

The following table describes the supported databases for a Multimaster Distributed System environment.

Multimaster Distributed System - Supported Databases

Database Version	Supported NA Versions	Limitations
Oracle 10g R2 (10.2.0.2 or 10.2.0.4) Enterprise Edition	9.10 with or without patches	No more than five HP Network Automation Cores can be configured together.
Oracle 10g R2 (10.2.0.5) Enterprise Edition	9.10.02 or the latest consolidated patch	
Oracle 11g R1 (11.1.0.7) Enterprise Edition	9.10 with or without patches	
Oracle 11g R2 (11.2.0.1) Enterprise Edition	9.10 with or without patches	
Oracle 11g R2 (11.2.0.3) Enterprise Edition	9.11 or later	
Microsoft SQL Server Standard or Enterprise Edition 2005 (SP2 or higher)	9.10 with or without patches	No more than two HP Network Automation Cores can be configured together. The maximum number of managed devices should not exceed 6,500.
Microsoft SQL Server Standard or Enterprise Edition 2008	9.10 with or without patches	
MySQL	None	MySQL is not supported for Multimaster Distributed System environments.

Refer to the *HP Network Automation 9.10 Multimaster Distributed Systems on Oracle User's Guide* or the *HP Network Automation 9.10 Multimaster Distributed System on Microsoft SQL Server User's Guide* for information on configuring a Multimaster Distributed System environment.

Databases for Horizontal Scalability

The following table describes the supported databases for a Horizontal Scalability environment.

Horizontal Scalability - Supported Databases

Database Version	Supported NA Versions	Limitations
Oracle 10g R2 (10.2.0.2 or 10.2.0.4) Standard or Enterprise Edition	9.10 with or without patches	No more than five HP Network Automation application servers can be configured together with a single database.
Oracle 11g R1 (11.1.0.7) Standard or Enterprise Edition	9.10 with or without patches	
Oracle 11g R2 (11.2.0.1) Standard or Enterprise Edition	9.10 with or without patches	
Oracle RAC on Oracle 11g R2 (11.2.0.1) Standard or Enterprise Edition	For 9.10.01 or later, new installations of NA only	
Oracle 11g R2 (11.2.0.3) Standard or Enterprise Edition	9.11 or later	
Microsoft SQL Server Standard and Enterprise Edition 2005 (SP2 or higher)	9.10 with or without patches	No more than five HP Network Automation application servers can be configured together with a single database.
Microsoft SQL Server Standard and Enterprise Edition 2008	9.10 with or without patches	
Microsoft SQL Server 2008 R2 Standard or Enterprise Edition	9.11 or later	
MySQL	None	MySQL is not supported for Horizontal Scalability environments.

For information on configuring a Horizontal Scalability environment, refer to the *HP Network Automation 9.10 Horizontal Scalability User's Guide*.

Authentication

For NA user authentication into the NA user interface, NA has been validated with the following authentication components:

- Microsoft Active Directory on Windows Server 2008 with Domain and Forest function level: Windows 2000

- Cisco Secure Access Control System version 3.1 for TACACS and RADIUS

- Cisco Secure Access Control System version 5.1 for TACACS

- OpenLDAP version 2.4.23

- On the NA application server, RSA Authentication Manager version 6.1 with SecurID Software Tokens version 3.x and SoftID version 3.0.7 or 4.1 (needed for the Windows operating system only)

- Single sign-on from HP Server Automation (HP SA) 9.00

- Single sign-on from HP Operations Orchestration (HP OO) 9.00

For NA user authentication into the command-line interface (through telnet or SSH proxy), NA has been validated with the following authentication components:

- Microsoft Active Directory on Windows Server 2008 with Domain and Forest function level: Windows 2000

- Cisco Secure Access Control System version 3.1 for TACACS and RADIUS

- Cisco Secure Access Control System version 5.1 for TACACS

- OpenLDAP version 2.4.23

For device authentication from NA, NA has been validated with the following authentication components:

- Cisco Secure Access Control System version 3.1 for TACACS and RADIUS

- Cisco Secure Access Control System version 5.1 for TACACS

Note: RSA device authentication is available on Windows 2003, 32-bit only.

Satellite Configuration

Satellite configurations use HP Server Automation tunnels. Sharing Gateways between HP Server Automation (SA) and HP Network Automation (NA) is supported in SA 7.50 and NA 7.60.

If you are running a HP Network Automation (NA)/HP Server Automation (SA) Satellite co-residency environment, you will need two CPUs, 4 GB RAM, and 128 GB disk space. You can only manage 1,500 servers and 5,000 network nodes. Refer to the *HP Network Automation 9.10 Satellite User's Guide* for information on configuring a Satellite environment.

Cross Product Compatibility

The following table provides information on cross product compatibility. Unless otherwise stated, patched versions of NA also integrate with patched or unpatched versions of the products listed here.

HP Network Automation	HP Network Node Manager	HP Server Automation	HP Operation Orchestration	HP Live Network Connector[2]	HP BSA Essentials
9.10	9.10[1]	7.8x, 9.00, 9.01, 9.10	7.60, 9.00	3.0.1 or later	2.01[3]
9.00	8.1x, 9.00	7.8x, 9.00, 9.01	7.60, 9.00	3.0.1 or later	2.01[4]
7.60 7.60.01 7.60.02	8.1x, 9.00[5]	7.8x	7.60	2.3.4 or later	2.00
7.50 7.50.0x[6]	7.5x 8.00.01 8.1x	7.50[7] 7.8x	7.50 7.50.02[8] 7.60.01	2.3.4 or later	
7.2x	7.5x 8.00.01 8.1x	7.5	7.50 7.60.01	2.3.4 or later	

Notes:

1. HP Network Automation 9.10 does not support HP Network Node Manager 8.xx or 9.00.

2. The Latest HP Live Network Connector is recommended.

3. For NA 9.10 to support HP BSA Essentials 2.01, please contact HP BSA Essentials Support for assistance.

4. HP Network Automation 9.00 supports HP BSA Essentials 2.01 with the additional HP BSA Essentials 2.01 hot-fix.

5. HP Network Node Manager 9.00 requires HP Network Automation 7.60.02 or above.

6. HP Network Node Manager integration with HP Network Automation 7.50x requires a separate patch (HP Network Automation 7.50.xx). To download NA patches, go to: http://support.openview.hp.com/ using your Passport credentials.

7. Refer to the HP Server Automation documentation for the requirements to integrate HP Server Automation 7.8x with HP Network Automation 7.50x, 7.60x, 9.00, and 9.10.

8. HP Operation Orchestration 7.50 Content Flows do not support HP Network Automation 7.60. HP Operation Orchestration 7.50.02 is required.

Virtual Environments

If you are running HP Network Automation 9.10 in a virtual environment, review the guidelines in the *HP Network Automation 9.10 Upgrade and Installation Guide*.

Keep in mind that HP Network Automation can be network intensive. As a result, if you have many virtual machines sharing a virtual switch and network interface card, you could experience unexpected behavior, including time-outs and failed tasks. In addition, each virtual environment is different and could function differently under loads with shared VM Guests. The HP Network

Automation VMware Guest system requirements should, at a minimum, be double that of standalone server requirements.

Note: HP does not require customers to recreate and troubleshoot every product issue in a non-virtual environment. However, HP reserves the right to request that customers diagnose certain issues in a native, certified operating system environment without the virtual image. HP will only make this request when there is reason to believe that the virtual environment is a contributing factor to the issue.

Web Browsers

General Web Browser Requirements

- Any Window Popup Blockers must be disabled for the browser.
- Cookies must be enabled for the browser.

Supported Web Browsers

- Mozilla Firefox 3.x
- Internet Explorer 7.x and higher

Note: Mozilla Firefox 4.0 and later are not supported.

Note: Third-party products mentioned in this documentation are manufactured by vendors independent of HP. HP makes no warranty, implied or otherwise, regarding the performance or reliability of these products. We provide third-party contact information to help you find technical support. However, third-party contact information is subject to change without notice and, therefore, HP can in no way guarantee the accuracy of this contact information.

Internationalization and Localization Support

HP Network Automation 9.10 can be installed on an operating system running under the following non-English locales or character sets:

- UTF-8
- GB2312 for Simplified Chinese
- Shift-JIS for Japanese
- EUC-KR for Korean

Note: To switch the locale of an English Win03 platform to Asian languages, the DBCS support must first be installed.

During HP Network Automation installation, you are prompted to select a Collation Type when configuring a new Microsoft SQL Server database. The goal is to facilitate the use of HP Network Automation, regardless of your native language, writing system, and cultural conventions.

Microsoft SQL Server collation dictates the character set that is stored in the database. For example, if you select a Chinese collation, you can only enter Chinese characters, not Japanese, Korean, and so on. Keep in mind, however, you can always enter Latin characters regardless of the collation type you select.

HP Network Automation 9.10 supports the following collections other than SQL_Latin1_ General_CP1_CI_AS:

- Chinese_PRC_CI_AS
- Japanese_CI_AS
- Korean_Wansung_CI_AS

When using HP Network Automation globalization support with Oracle, you must specify the appropriate database character set when creating a new Oracle database. In addition, if the language you select is double-byte encoded, for example Chinese, Korean, or Japanese, you might also want to set the NLS_LENGTH_SEMANTICS initialization parameter to "CHAR", so that your one DBCS character will be counted as "one" instead of "two".

Note: Please refer to your Oracle documentation for detailed information on setting parameters when creating a new Oracle database.

HP Network Automation 9.10 supports UTF-8 non-English Oracle locales. HP Network Automation 9.10 does not support any language other than English when MySQL is used as the back-end database.

As a result of the language you select, you can enter the following information into HP Network Automation in that language:

- Comment fields
- Description fields
- Custom data labels
- Most name and text fields, such as device location and vendor

You can search on single and multi-byte character sets, as long as the field being searched accepts them. You can also import and export configuration policies that contain single and multi-byte character sets.

For more information on collation, refer to your DBMS documentation.

Additional Applications

You will need access to the following applications:

Required

- Adobe® Flash Player 9.x and above for the browser.

Optional

- Adobe® Acrobat Reader™ version 4.0 or higher if you are viewing HP Network Automation documentation from the HP Network Automation server.

- Microsoft Excel 2000 or higher, if you are viewing Summary Reports from the HP Network Automation server.

- ActivePerl 5.8.x (for Windows)

- Perl 5.8.x (for Solaris and Linux)

- Perl Net::SSH::Expect module (for using the Connect module with SSH)

  Note: The HP Network Automation Convert-to-Perl script feature uses Perl.

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We appreciate your feedback!

If an email client is configured on this system, by default an email window opens when you click *here*.

If no email client is available, copy the information below to a new message in a web mail client, and then send this message to **ovdoc-nsm@hp.com**.

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Feedback: