

# Verax NMS & APM Installation Guide for UNIX and Windows

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## Introduction

This guide describes the installation procedure for Verax NMS & APM. Verax NMS & APM provides unified, service-oriented management & monitoring of networks, applications and infrastructure ensuring complete visibility and control of all ongoing operations and business services.

The installation guide contains installation and configuration steps required to get the system installed, up and running. Further configuration instructions are provided in the on-line help.

## Notation used

Source code, commands, user-entered data, on-screen messages and user interface elements (menus, choice lists, etc.) are shown using the `Courier` font, for instance:

```
ls -al
```

**!** This notation (Information) is used to indicate important information.

⚠ This notation (Warning) is used to flag actions that can lead to data loss, system malfunction, etc. and should be used with extreme caution.

ℹ This notation (Hint) is used to indicate additional information.

The following icons are used to indicate a particular operating systems:



Linux



Microsoft  
Windows



Linux/Solaris  
/AIX

# 1 Compatibility

## 1.1 Supported operating systems

Verax NMS & APM is written in the Oracle (Sun) Java programming language. Due to Java's portable nature, it runs on most of the modern computer systems. The following OS platforms are regularly tested and are fully supported:

- 64-bit (x64) **Linux** distributions: RedHat/CentOS (recommended), Ubuntu and Debian.
- 64 (recommended) and 32-bit **Microsoft Windows** including: Windows 2000, Windows XP (Professional edition only), Windows Vista (Home or Professional), Windows 7 (Home or Professional), Windows 8 (Home or Professional), Windows Server 2003, Windows Server 2008 (WMI support is required).
- Oracle (Sun) **Solaris** 10 and higher on Intel and SPARC hardware.
- IBM **AIX** 5 and higher.

NMS & APM can be installed on any operating system supporting Java, such as AS/400, FreeBSD, Mac OS X and others. Please contact us to obtain up-to-date compatibility information.

## 1.2 Supported databases

Verax NMS & APM supports **Oracle** 10g and higher (including the free Express Editions) and **Microsoft SQL Server** 2008 and 2012 (including the free Express Editions). Please contact us to obtain up-to-date information on database version compatibility.

## 2 Hardware and software requirements

Please note that system sizing (calculation of CPU power, RAM, disk space, database space) is strictly dependent on the amount of data stored (number of managed elements, data retention times, etc.). The figures provided in this section are estimates only – please contact Verax Systems to obtain detailed sizing information for your installation.

### 2.1 Server storage

The NMS & APM requires about 650 MB of available disk space for installation.

WIN

When using the bundled Oracle 11 Express Edition (Oracle XE), additional 15 GB of disk space and at least additional 1 GB of RAM are required for Oracle.

### 2.2 Database storage

Estimated database storage for a year of operation can be calculated based on the following formula (a managed element is a single physical device or an application):

$$\text{Storage size} = 30\text{MB} * \langle \text{number of managed elements} \rangle$$

### 2.3 Server RAM

Estimated RAM size requirements can be calculated based on the following formula:

$$\text{RAM size} = 4\text{GB} + (10\text{MB} * \langle \text{number of managed elements} \rangle)$$

## 2.4 Server network connection

The NMS & APM server requires a static IP address. It is recommended that the server has a configured DNS (Domain Name System) name resolvable by the server and connecting workstations.

- \* Under some virtualization environments (e.g. OpenVZ), virtual network interfaces do not have associated MAC addresses. In such cases, the NMS & APM will not be able to read the license file, as it is tied to the MAC address, therefore MAC addresses on virtual adapters must be set.

## 2.5 Client workstations

Client workstations have to be equipped with a web browser: Internet Explorer, Firefox Chrome and others supporting Adobe Flash Player version 11 or higher. In case of doubt, please contact us to obtain up-to-date information on browser compatibility.

For comfortable work, client workstations should have 1GB of free RAM and Microsoft CPU index of 2.0.

### 3 Installation types

NMS & APM can be installed by using one of the following packages:

- **Windows installer** with bundled Java, Apache Tomcat and Oracle Express Edition (XE) database (an already set up Oracle or SQL Server database can also be used). This type of installation is described in section 4.
- **UNIX installer** with bundled Java and Apache Tomcat. A running Oracle or Microsoft SQL database is required. This type of installation is described in section 5.
- **VMware Player image** containing pre-installed 64-bit CentOS 6 Linux, free Oracle Express database, NMS & APM and Service Desk. The image is in the VMware Player format and can be converted to VMware ESX/ESXi, Microsoft Hyper-V, Citrix Xen, Oracle VirtualBox and KVM formats. This type of installation is described in section 6.

A brief comparison of all three installers is presented below:

	Windows installer	UNIX installer	VM image
<b>Supported operating system</b>	Windows	Linux (CentOS, Debian, Ubuntu), Solaris, AIX	VMware Player, VMware ESX/ESXi, Microsoft Hyper-V, Citrix Xen, Oracle VirtualBox, KVM
<b>32-bit</b>	Yes	No	No
<b>64-bit</b>	Yes	Yes	Yes
<b>SQL Server support</b>	Yes	Yes	N/A
<b>Oracle support</b>	Yes	Yes	N/A
<b>Bundled Oracle XE</b>	Yes	No	Yes

## 4 Installing from Windows installer

The NMS & APM installer for Windows includes all components required to run the system including the JRE, Apache Tomcat application server and Oracle Express database. It also contains Verax Core services and Administrator Console, which are shared among all Verax applications.

- ① The installation **must** be performed on a user account with administrator privileges.
- ① The setup language is always **English**. Once installed, the NMS & APM user interface language can be switched as required depending on the installed language packs.
- ① The NMS & APM Installer verifies if Verax Core Services are already installed (if so, they are not installed for the second time). The installation steps described below assume that Core Services have not been yet installed.

In order to install NMS & APM for Windows:

1. Copy the installation package to a temporary directory (e.g. one specified by the `%TEMP%` environment variable) and run the following command:

**WIN**

```
nms-2.6.0-windows-installer.exe
```

2. Since the installer requires administrator privileges to run, a security message is displayed on Windows Vista and higher. Allow the installer to proceed by clicking the **Yes** button.
3. Once the package is verified by the installer, the welcome dialog is shown. Start the installation process by clicking **Next**.
4. Read and accept the end-user license agreement and click **Next**.

5. Register your name and company and click **Next**.
6. Specify target path where NMS & APM and Core Services (if not already present) are to be installed  
(the default directory is `C:\Program Files\Verax Systems`)  
and click **Next**.
  - ① On 64-bit systems `Program Files (x86)` is used rather than `Program Files`.

7. Select the database type to be used:

**Install and use bundled Oracle 11g XE** (default) – this option will install the bundled Oracle 11g Express Edition and configure it to work with NMS & APM: create SYS user, create NMS & APM database user and prepare the database schema.

**Use already existing Oracle database** – this option allows installing NMS & APM to work with an already existing Oracle database. Please note that at the time of installation, the database must be accessible and database access login for NMS & APM must have already been created.

**Use already existing Microsoft SQL Server database** – this option allows installing NMS & APM to work with an already existing Microsoft SQL Server database. Please note that at the time of installation, the database must be accessible and database access login for NMS & APM must have already been created.

8. Select the database type and click **Next** to proceed with the installation.

The procedure below describes installation with the **bundled Oracle Express**:

1. If an existing copy of Oracle Express is found on your system, the installer will detect and recommend using it.
2. In order to create a new database user, the SYS user and password must be known and provided at installation time. If an existing database/user is to be used, database connection details (username and password, Oracle management HTTP port, database listener port and transaction server port) must be known and provided at installation time.

3. If creating NMS & APM database using an already existing database user, the SYS user and password must be also provided in order to update parameters of the user account. Alternatively, if SYS credentials are not known at installation time, the installer will display SQL queries to be executed by a system administrator once the installation has been completed.
  4. Provide and confirm database credentials and parameters and click **Next** to proceed.
- ① Please note that on Oracle XE each user has only a single associated schema.

The procedure below describes installation steps with an already **existing database**:

1. Select database connection properties in the dialog box and click **Next**.
  - ① In this case, the database connection properties will be used by the NMS & APM to connect to the database.
2. The installer will attempt to establish a database connection using provided login credentials. This operation must succeed in order to proceed.

Once the database has been configured, the subsequent installation steps are as follows:

3. Provide username and password for the user with administrator privileges (e.g. SYS user account for Oracle) and click **Next**.
  - ① In this case, the credentials will be used by the installer to adjust the database parameters to comply with NMS & APM requirements.

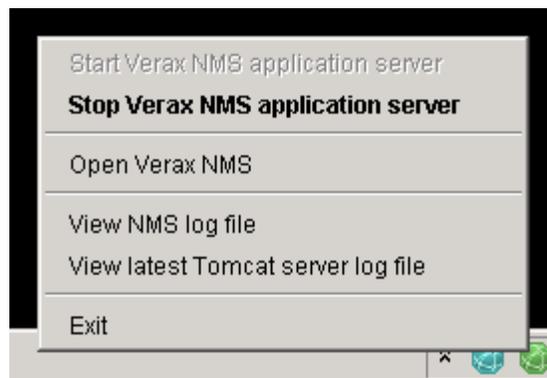
4. Provide TCP ports for NMS & APM and Core Services (if not installed), server name as a DNS name (preferably) or IP address (the installer will automatically attempt to resolve and suggest the DNS name) and click **Next**. At this stage experienced system administrators may change Apache Tomcat parameters (click the **Restore defaults** button to revert to default values). The installer checks if the specified ports are available for use before allowing to proceed. By default port 9400 is used by Verax NMS & APM, 9200 for Core Services.
5. Provide Windows program group (Verax NMS & APM by default) and click **Next** to start the installation.
6. If Windows firewall is enabled, confirm Java security settings as presented below:



Once the installation has been completed the system is up and running – please click on the NMS & APM tray monitor icon to log in to NMS & APM.

#### 4.1 NMS & APM tray monitors

The Windows installer creates **NMS & APM Application Server** and **Core Services Application Server** Windows services for the corresponding Apache Tomcat servers. Each service has a corresponding **tray monitor** tool. The tray monitors start automatically and display server status in the Windows system tray, located near the clock:



Right-clicking on the NMS & APM tray monitor icon displays a menu with the following options:

- **Start Verax NMS & APM application server** – starts the NMS & APM application server service,
- **Stop Verax NMS & APM application server** – stops the service,
- **Open Verax NMS & APM** – launches a web-browser and opens NMS & APM login page (also accessible via double clicking on the tray monitor icon),
- **View NMS & APM log file** – displays application log file for NMS & APM (used for troubleshooting and support purposes),
- **View latest Tomcat server log file** – displays Apache Tomcat server log file (used for troubleshooting and support purposes),
- **Exit** – Turns the NMS & APM Tray Monitor off (it does **not** shut the NMS & APM server down). The Tray Monitor can be restarted from the Windows Start Menu Verax NMS & APM group.

Identical menu options are available for the Core Services tray monitor.

Both Windows services can also be managed by launching “Administrator Tools /Services” from the Windows Control Panel or by typing “Services.msc” in the Run command from the Windows Start Menu.

## 5 Installation from UNIX installer

### 5.1 Starting the installation

In order to install NMS & APM: log in as **root**, copy the installation .bin file to a temporary directory (for instance `/tmp`), make it executable and run it:

```
chmod u+x nms-2.6.0-bundle-linux-installer.bin
```

```
./nms-2.6.0-bundle-linux-installer.bin
```

Use `sudo` when running a root shell is not allowed or discouraged (e.g. Ubuntu or Debian Linux distributions):

```
sudo ./nms-2.6.0-bundle-linux-installer.bin
```

Follow the on-screen instructions as they appear.

### 5.2 Checking the installation

In order to check if the installation succeeded, run core and NMS & APM services from the command line as **root**:

```
/etc/init.d/verax-core status
```

```
/etc/init.d/verax-nms status
```

Use `sudo` when running a root shell is not allowed or discouraged (e.g. Ubuntu or Debian Linux distributions):

```
sudo /etc/init.d/verax-core status
```

```
sudo /etc/init.d/verax-nms status
```

Once the server startup has been completed (it can take even **up to a few minutes** on low-end systems), point the browser to the NMS & APM server URL (e.g. `http://localhost:9400`). If the NMS & APM configuration page is displayed, the installation was successful. If possible, test NMS & APM startup after a reboot.

### 5.3 Uninstalling

Run the following script as **root** to uninstall Verax NMS & APM:

```
/opt/verax/nms/bin/uninstall.sh
```

Use **sudo** when running a root shell is not allowed or discouraged (e.g. Ubuntu or Debian Linux distributions):

```
sudo /opt/verax/nms/bin/uninstall.sh
```

Run the following script as **root** to uninstall all Verax applications (e.g. Administrator Console, Service Desk, etc.)

```
/opt/verax/uninstall.sh
```

## 6 Installing VMware virtual machine

The VMware image contains a pre-installed 64-bit CentOS 6 Linux, free Oracle Express database, NMS & APM and Service Desk. The image is in the VMware Player format and can be converted to the following virtualization platforms:

- VMware ESX/ESXi/Player
- Microsoft Hyper-V
- Citrix Xen
- Oracle VirtualBox
- KVM

Conversions instructions are available on-line:

<http://download.veraxsystems.com/download/vm-conversion-instructions.txt>

### 6.1 Virtual machine hardware configuration

The virtual machine is configured as follows:

- 6 GB RAM (upgrade to 8 recommended)
- 2 CPU cores (upgrade to 4 recommended)
- 100 GB disk space (only 12 GB are initially used)

### 6.2 Virtual machine passwords

All **system passwords** (including Linux root, Oracle database, etc.) are set to "nms".

NMS & APM, Service Desk and Administrator Console logins are "admin" (username) and "pass" (password).

### 6.3 Installation

Installation instructions are available on-line:

<http://download.veraxsystems.com/download/vm-2.6.0-README.txt>

## 7 Logging in for the first time

Point the browser to Verax NMS & APM at: `http://<server host name>:9400` and enter administrator username and password (`admin` and `pass` are the installation defaults).

## 8 Entering a license key

In order to generate a **license key request** for Verax NMS & APM:

1. Log in to the Administrator Console.
2. Select `Settings` from the management aspect drop down (upper right corner) and click `Go`.
3. Navigate to `Licenses` tab.
4. Select `Generate license request` from the global action menu and click `Go`.
5. Copy the license request information and send it to [sales@veraxsystems.com](mailto:sales@veraxsystems.com).

Once you receive the license files via e-mail, they **need to be imported**:

1. Log in to the Administrator Console.
2. Select `Settings` from the management aspect drop down (upper right corner) and click `Go`.
3. Navigate to `Licenses` tab.
4. Select `Import license file` from the global action menu and click `Go`.
5. Point to the license file and click `Open` to load it.
6. Restart NMS & APM.

## 9 Installation of non-distributable, third party libraries

Managing of MySQL and IBM WebSphere with Verax NMS & APM requires additional, vendor-provided libraries. These libraries can be downloaded free of charge, however they cannot be distributed by Verax Systems due to licensing limitations:

System	Libraries
IBM WebSphere	<code>com.ibm.mq.commonservices.jar</code> <code>com.ibm.mq.connector.jar</code> <code>com.ibm.mq.headers.jar</code> <code>com.ibm.mq.jar</code> <code>com.ibm.mq.jmqi.jar</code> (the libraries above come with WebSphere distribution) <code>com.ibm.mq.pcf.jar</code> (downloaded from <a href="http://www-01.ibm.com/support/docview.wss?uid=swg24000668">http://www-01.ibm.com/support/docview.wss?uid=swg24000668</a> )
MySQL	<code>mysql-connector-java-5.1.9-bin.jar</code>

Once downloaded, the libraries should be copied to:

**WIN**

<installation directory>\NMS\opt\verax\workers\lib  
 and  
 <installation directory>\NMS\tomcat-nms\webapps\enetworkmanagementsystem-fds\WEB-INF\lib

**UNIX**

/opt/verax/nms/workers/lib  
 and  
 /opt/verax/nms/tomcat-nms/webapps/enetworkmanagementsystem-fds/WEB-INF/lib

## 10 APPENDIX 1: Important file locations

### 10.1 Configuration files

All NMS & APM configuration files are located in `/etc/verax.d` (UNIX/Linux) or `c:\Windows\etc\verax.d` directories (Windows) and have the `.properties` extension:

File	Description
<code>eNMS.properties</code>	Main configuration file.
<code>eNMSWorkers.properties</code>	Workers (background process such as Event Collector) configuration file.
<code>eAdministratorConsole.properties</code>	Administrator Console configuration file.
<code>eBatchManager.properties</code>	Batch Manager configuration file. The batch manager is a CRON-like scheduler responsible for running and supervising of background workers such as event collectors, event processors and others.
<code>htmlGateway.properties</code>	HTML gateway configuration file. The HTML gateway provides a simplified web-based interface for tablets and mobile phones.

### 10.2 Log files

Log files are available in the following directories:

**WIN**

`<installation directory>\NMS\var\log\verax`  
and  
`<installation directory>\core\var\log\verax`

**UNIX**

`/var/log/verax/nms`  
and  
`/var/log/verax/ac`

## 11 APPENDIX 2: Oracle database configuration

### 11.1 Setting Oracle database server parameters

When using an existing Oracle database for NMS & APM, please make sure that server parameters have the following minimum values set:

Parameter	Oracle 10g	Oracle 11g and higher
processes	300	500
sessions	300	500
transactions	330	999
open_cursors	300	700
session_cached_cursors	50	100
cursor_sharing	SIMILAR	obsolete in 11g, FORCE
cursor_space_for_time	TRUE	obsolete in 11g
db_writer_processes	2	2

To update these parameters, log into Oracle as SYS with SYSDBA with SQL\*Plus and execute the following commands:

```
alter system set processes=500 scope=spfile;
alter system set sessions=500 scope=spfile;
alter system set transactions=999 scope=spfile;
alter system set open_cursors=500 scope=spfile;
alter system set session_cached_cursors=100 scope=spfile;
alter system set cursor_sharing='SIMILAR' scope=spfile;
alter system set cursor_space_for_time=TRUE scope=spfile;
alter system set db_writer_processes=2 scope=spfile;
shutdown immediate;
startup;
```

## 11.2 Creating Oracle database user

When using an existing Oracle database for NMS & APM, please use the following commands to create user account for the NMS & APM user, modifying name, password and tablespace as required (log into Oracle with SQL\*Plus as SYS with SYSDBA role, and execute):

```
create user verax identified by verax default tablespace users
temporary tablespace temp account unlock;
alter user verax quota unlimited on USERS;
alter user verax PROFILE DEFAULT;
grant connect to verax;
grant resource to verax;
grant select_catalog_role to verax;
grant select any dictionary to verax;
grant create view to verax;
grant unlimited tablespace to verax;
grant create any directory to verax;
grant drop any directory to verax;
grant execute on utl_file to verax;
grant execute on DBMS_LOCK to verax;
grant create session to verax;
```