Remote Installation Notes
NuDesign SNMPv3 Agent Service for Windows
Documenting All Steps

1. General Installation Notes

The intent of this note is to outline the necessary steps and their order for Mass Installation of the NuDesign SNMPv3 Agent Service (NDT SNMPv3 Service) on Remote Computers. The network administrator may modify them to suit the needs of their network installation.

This note is for the 64bit NDT SNMPv3 Service, where the **Windows System Directory** is **System32** and **NDT Configuration Registry** file is called **NDMPCfg64.reg**. For the 32 bit NDT SNMPv3 Service, the **Windows System Directory** is **SysWow64** and the **NDT Configuration Registry** file is called **NDMPCfg.reg.** This document will use the **NDMPCfg64.reg** registry file name when manipulating the NDT SNMPv3 Service configuration registry content.

When updating your existing NDT SNMPv3 Service configuration or installing a new version of NDT SNMPv3 Service, always rename and save your previous NDT SNMPv3 Service configuration registry and the run-time files, for backup. The "Command Prompt" when running the "sc" and "regedit" commands in the Mass Installation scenarios must be started with the "Run as Admin" credentials.

For details about all aspects of NDT SNMPv3 Service, please consult its Help file, included with the product or available on the web site at www.ndt-inc.com/SNMP/HelpFiles.html

2. Relevant NDT SNMPv3 Service File Directories and Registry Branches

1. **Install Directory** - C:\Users\<UserName>\Documents or ..\Downloads - this is where 3rd party Extension DLL Installer, the NDT SNMPv3 Service Installer and NDT Service Configuration File NDMPCfg64.reg are typically placed for installation.
2. **Target Directory** - the default selected by the NDT SNMPv3 Service Installer is C:\Program Files\NuDesign Tools\NDT SNMPv3 Agent Service x64 directory. It contains: SNMPv3 Service's Software License Agreement, Help, ReadMe, NDT Configuration Editor exec, sample MIBs, sample NDMPDynConfig.xnv, sample "send notifications" project.
3. **Windows System Directory** - C:\Windows\System32 - this is where the NDT SNMPv3 Service executable file, NDAgnt.exe, support DLL NDSXApi.dll, dynamic configuration file NDMPDynConfig.xnv and key license file NuDesignSNMPServiceLicenseKey.txt need to be installed.
4. **NDT Service Registry branch** - this is where the NDT Service stores its configuration, including pointers to MS and 3rd party Extension DLLs (which have their own registry space)
    - `HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\services\NDMPAgent64`

This document is provided for informational purposes only, 'as is' and without warranty of any kind, using it you are consenting to NuDesign SNMPv3 Agent Service for Windows License Agreement. This document may be copied, however without any modification, all pages, full text and notices must be included.

5. **NDT Service Event Log Registration Registry branch** - this is where the NDT SNMPv3 Service is registered as an Event Source with the MS Windows Event Log.
   - `HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\services\eventlog\Application\NDMPAgent64`
6. **NDT Service Configuration Editor Registry Keys** - content of these keys is set-up by the NDT SNMPv3 Service Installer on a Configuration Development Computer and it depends on the selection of **Target Directory** during the installation. The **Target Directory** of Remote Computers must match the **Target Directory** selected on the Configuration Development Computer.
   - `HKEY_CLASSES_ROOT\CLSID\{C51D7A42-0033-4d05-AC69-B63C4A766278}`
   - `HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\explorer\ControlPanel\NameSpace\{C51D7A42-0033-4d05-AC69-B63C4A766278}`

3. Configuring the NDT SNMPv3 Service on a Configuration Development Computer

1. install 3rd party Extension DLLs as per their vendor's instructions.
2. place the **NuDesignSNMPServiceLicenseKey.txt** Key License file in the **Windows System Directory.**
3. install the **NDT SNMPv3 Service** using the provided **NDT SNMPv3 Service Installer** (it will automatically load and register Microsoft sub agent Extension DLLs). It will also install a default SNMPv3 demonstration configuration, matching the configuration of NuDesign's **Visual MIBrowser Pro** to provide for quick SNMPv3 Service connectivity testing and overall installation verification.
4. using the **NDT Service Configuration Editor** implement your specific, production SNMPv3 configuration (remember to remove the default SNMPv3 demo configuration before deployment), verify Microsoft's and 3rd party Extension DLL's load and registration status.
5. using the "Save" button of the NDT Service Configuration Editor, save the completed configuration to the registry, then using the "Export" button, save it as **NDMPCfg64.reg** registry file to a working directory of your Development Computer, for later distribution to Remote Computers, as discussed in the next sections.
6. modify provided default **NDMPDynConfig.xnv** file so at a minimum it generates a unique Engine ID for each remote Service installation and localizes its USM Users keys using such Engine ID. Review **NDMPDynConfig.xnv** short description below and its full capabilities description in the NDT SNMPv3 Service's Help file.
7. Save the following registry file for distribution. It registers NDT SNMPv3 Service as an Event Source in the MS Windows Event Log:
   a. `regedit /e NDT_EventRegister.reg HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\services\eventlog\Application\NDMPAgent64`

This document is provided for informational purposes only, 'as is' and without warranty of any kind, using it you are consenting to NuDesign SNMPv3 Agent Service for Windows License Agreement. This document may be copied, however without any modification, all pages, full text and notices must be included.

8. if planning to install the **NDT Service Configuration Editor** on Remote Computers, save the following registry files, for distribution. These settings enable showing the Configuration Editor in the Windows Control Panel:
    a. `regedit /e NDT_CLSID.reg HKEY_CLASSES_ROOT\CLSID\{C51D7A42-0033-4d05-AC69-B63C4A766278}`
    b. `regedit /e NDT_ControlPanel.reg HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\explorer\ControlPanel\NameSpace\{C51D7A42-0033-4d05-AC69-B63C4A766278}`

4. Initial Mass Installation of NDT SNMPv3 Service on Remote Computers

Using your preferred method of remote file installation, "push" out to each remote server, the following files and perform the following actions from your installation script.

1. place in the **Install Directory**
    a. each 3rd party Extension DLL's Installer, if any
    b. **NDMPCfg64.reg,** - the NDT SNMPv3 Service configuration registry file
    c. **NDT_EventRegister.reg** - Event Log's registry update file, registering NDT SNMPv3 Service as an Event Source
    d. **NDT_CLSID.reg** & **NDT_ControlPanel.reg** - optional Control Panel registry files
2. place in the **Windows System Directory** the following files:
    a. **NDAgnt.exe** – the NDT SNMPv3 Service executable
    b. **NDSXApi.dll** – a support DLL
    c. **NDMPDynConfig.xnv** – the Dynamic Configuration file. The .xnv file should have its R/W attributes on to enable its programmed removal after configuration.
    d. **NuDesignSNMPServiceLicenseKey.txt** – the Key License file
3. optionally place in the **Target Directory** – create the same **Target Directory** as on the Configuration Development Computer and copy there the following files, **only if** the remote location needs local access to the configuration editor: Service's License Agreement, ReadMe, Service Help and NDT Service Configuration Editor exec files .
4. for NDT SNMPv3 Service rev prior to rev16, download & install Microsoft Visual C++ 2008 SP1 redistributable (x64) lib, if not already installed. Not required for rev16 & up.
5. enable Microsoft's SNMP Service feature - this will unpack MS Extension DLLs for use with the NDT SNMPv3 Service. Depending on which Windows / Windows Server you are using you may find that Simple Network Management Protocol (SNMP) feature is available as a "Feature" or as an "Optional Feature". The recommended process is to first update your Windows with the latest MS updates, in fact Windows 10, depending on its version, must be updated for this process to succeed. Then execute the following commands to cover the above scenarios, one of them will succeed, depending on your Windows type. The final outcome is that its Windows MS SNMP Service is enabled and its MS DLLs are loaded. The commands are:
    a. `dism /online /NoRestart /Enable-Feature /FeatureName:SNMP`

This document is provided for informational purposes only, 'as is' and without warranty of any kind, using it you are consenting to NuDesign SNMPv3 Agent Service for Windows License Agreement. This document may be copied, however without any modification, all pages, full text and notices must be included.

   b. `dism /online /NoRestart /Add-Capability /capabilityname:SNMP.Client~~~~0.0.1.0`

   Note that the NDT SNMPv3 Service will stop the MS Service and set it to "manual" status, when it is started as per bullet 12 below.

6. install any 3rd party Extension DLLs; they must be installed as per their vendor's instructions.
7. install NDMPAgent64 as a Service using the command:
   a. `sc create NDMPAgent64 binPath= C:\Windows\System32\NDAgnt.exe depend= EventLog displayname= "NuDesign SNMPv3 Agent Service (x64)" start= auto`
8. optionally set the description string for NDT SNMPv3 Service, NDMPAgent64, using the command:
   a. `sc description NDMPAgent64 "Enable Simple Network Management Protocol (SNMP) requests to be processed by this computer. If this service is stopped, the computer will be unable to process SNMP requests. If this service is disabled, any services that explicitely depend on it will fail to start."`
9. replace the Service's configuration with the content of the NDMPCfg64.reg file, using the command:
   a. regedit /s NDMPCfg64.reg
10. replace the Event Log configuration update information with the content of the NDT_EventRegister.reg file, using the command:
   a. regedit /s NDT_EventRegister.reg
11. if installing the **NDT Service Configuration Editor** on the remote hosts, replace the following registry information with the content of the files from the Development Computer. It enables showing the Configuration Editor in the Windows Control Panel:
   a. `regedit /s NDT_CLSID.reg`
   b. `regedit /s NDT_ControlPanel.reg`
12. start the NDT SNMPv3 Service using the command:
   a. `sc start NDMPAgent64`

Important Note for future Configuration Updates to the NDT SNMPv3 Service on Remote Hosts

While the update procedures provided below include pushing out the NDT Service's configuration file, the **NDMPCfg64.reg** file, to all remote hosts, in practice this needs only be done for the initial remote install described above, and for the future mass updates, only if a new 3rd party extension DLLs are being added, or a new VACM updates to vacmAccessTable or vacmViewTreeFamilyTable have been re-defined on a Development Host. For other updates, such as new USM Users or USM User's new passwords, or for updates to Service executables only, all required configuration changes will be fully conveyed via inclusion of **NDMPDynConfig.xnv,** the Dynamic Configuration file.

This document is provided for informational purposes only, 'as is' and without warranty of any kind, using it you are consenting to NuDesign SNMPv3 Agent Service for Windows License Agreement. This document may be copied, however without any modification, all pages, full text and notices must be included.

5. Mass Upgrade of the NDT SNMPv3 Service on Remote Computers – changing files and configuration

This section assumes that the Remote Hosts have the NDT SNMPv3 Service already installed and need to be upgraded with a new release of Service runtimes and a new configuration.

1. stop the existing NDT SNMPv3 Service and remove its current configuration, by running the following commands:
    a. `sc stop NDMPAgent64`
    b. `a script should execute "sc query NDMPAgent64" now, to verify it's stopped before attempting updating the executable.`
2. place in the **Install Directory,** the following updated files:
    a. each 3rd party Extension DLL's Installer, if any
    b. **optionally (see the Important Note on page 4) the NDMPCfg64.reg** – the NDT SNMPv3 Service configuration file
3. overwrite the following files in the **Windows System Directory**, with their updated copies:
    a. **NDAgnt.exe** - the NDT SNMPv3 Service executable
    b. **NDSXApi.dll** – a support DLL
    c. **NDMPDynConfig.xnv** – the Dynamic Configuration file.
    d. **NuDesignSNMPServiceLicenseKey.txt** – the Key License file
4. optionally, place in the **Target Directory** – copy from the Configuration Development Computer, **only if** the remote location needs local access to the configuration editor, the following updated files: Service's Software License Agreement, ReadMe, Service Help and NDT Service Configuration Editor exec files .
5. install additional 3rd party Extension DLLs (if any), as per their vendor's instructions.
6. **optionally (see the Important Note on page 4)** replace the Service's configuration with the content of the NDMPCfg64.reg file, using the command:
    a. regedit /s NDMPCfg64.reg
7. start the NDT SNMPv3 Service using the command:
    a. `sc start NDMPAgent64`

This document is provided for informational purposes only, 'as is' and without warranty of any kind, using it you are consenting to NuDesign SNMPv3 Agent Service for Windows License Agreement. This document may be copied, however without any modification, all pages, full text and notices must be included.

6. Mass Upgrade of the NDT SNMPv3 Service on Remote Computers – changing files only (retaining configuration)

This section assumes that the Remote Computers have the NDT SNMPv3 Service installed and need to be upgraded with the updated Service runtimes without changes to the configuration.

1. stop the existing NDT SNMPv3 Service using the command:
    a. `sc stop NDMPAgent64`
    b. `a script should execute "sc query NDMPAgent64" now, to verify it's stopped before attempting updating the executable.`
2. place in the **Windows System Directory** the following files, if updated:
    a. **NDAgnt.exe** – the NDT SNMPv3 Service executable
    b. **NDSXApi.dll** – a support DLL
3. place in the **Target Directory** - copy from the Configuration Development Computer only the updated files: Service's Software License Agreement, ReadMe, Help and NDT Configuration Editor exec files.
4. start the NDT SNMPv3 Service using the command:
    a. `sc start NDMPAgent64`

7. Mass Upgrade of NDT SNMPv3 Service on Remote Computers – a configuration only change

This section assumes that the Remote Computers have a previous version of NDT SNMPv3 Service installed and running and need to be upgraded with a new configuration only.

1. stop the NDT SNMPv3 Service and remove its current configuration using the commands (it will only remove the configuration registry, leaving all runtime files intact):
    a. `sc stop NDMPAgent64`
    b. `a script should execute "sc query NDMPAgent64" now, to verify it's stopped before attempting deleting it.`
2. **optionally (see the Important Note on page 4)** place in the **Install Directory** the following files:
    a. **NDMPCfg64.reg** – the NDT SNMPv3 Service configuration file
3. place in the **Windows System Directory** the following files:
    a. **NDMPDynConfig.xnv** – the new Dynamic Configuration file
4. **optionally (see the Important Note on page 4)** replace the Service's configuration with the content of the NDMPCfg64.reg file, using the command:
    a. regedit /s NDMPCfg64.reg
5. start the NDT SNMPv3 Service using the command:
    a. `sc start NDMPAgent64`

This document is provided for informational purposes only, 'as is' and without warranty of any kind, using it you are consenting to NuDesign SNMPv3 Agent Service for Windows License Agreement. This document may be copied, however without any modification, all pages, full text and notices must be included.

8. A short overview of the NDMPDynConfig.xnv Dynamic Configuration file facility

An example of the **NDMPDynConfig.xnv** file is placed by the NDT SNMPv3 Service Installer into the C:\Program Files\NuDesign Tools\NDT SNMPv3 Agent Service x64 directory. For a full description of all its configuration capabilities and options, please review the NuDesign SNMPv3 Service Help file.

The capabilities of SNMPv3 Service with regards to handling the **NDMPDynConfig.xnv** file and the options of this file itself, have undergone some changes with the release of SNMPv3 Service 16.10, yet the base defaults of the **NDMPDynConfig.xnv** file directives, included in the example below, provide for working configuration across all SNMPv3 Service releases, including those prior to rev16.10. Full explanation of such differences are included in the Service's Help file.

8.1 A brief overview of functions behind the NDMPDynConfig.xnv file

The idea behind the **NDMPDynConfig.xnv** file is to enable automated completion of SNMPv3 Service configuration to all remote hosts, after they've already received the SNMPv3 Service executable files, along with the Development Computer's SNMPv3 configuration registry file, in the form of its NDMPCfg64.reg file, as described in the previous sections of this document.

Once the upload of these files to the remote SNMPv3 Service's hosts has been completed, the next task is to adapt each remote Service's configurations to their specific remote host. The adaptation process is accomplished by placing the user modified **NDMPDynConfig.xnv** file (as explained below) in the System32 directory of each remote host, prior to the initial Service start. Upon start, the Service will execute the directives of **NDMPDynConfig.xnv** file, and on completion removing this file from its host, to protect the secret password information.

The configuration adaptation process starts with the generation of a unique Engine ID for each remote SNMPv3 Service. This in turn provides for the conversion of that Service usmUser specific passwords into local Engine ID's "localized keys" thus removing the knowledge of passwords from the remote SNMPv3 Service configuration files, since only the localized keys remain and these are different for every Service, thanks to a different Engine ID for each Service.

This localization process requires replacing the rows of the usmUserTable, which were provided by the push of the NDMPCfg64.reg file, and indexed by the original Engine ID, with the new ones, provided in the "to be processed format" by the **NDMPDynConfig.xnv** file. These rows must provide entries for all the same usmUsers, and their Group Names, as those preconfigured on the Development Computer, they also provide the passwords for these usmUsers, that will now be converted to the unique security keys, generated using the newly generated local Engine ID as a seed (see an example below).

This document is provided for informational purposes only, 'as is' and without warranty of any kind, using it you are consenting to NuDesign SNMPv3 Agent Service for Windows License Agreement. This document may be copied, however without any modification, all pages, full text and notices must be included.

This process will also update the original Engine ID values in the rows of snmpCommunityTable with the newly generated, unique Engine ID. All other rows of the snmpCommunity Table will be unchanged. Other SNMPv3 Tables are also left intact, as per the content of the previously installed NDMPCfg64.reg file.

The minimal **NDMPDynConfig.xnv** file presented below provides for updates of the remote SNMPv3 Service configurations, that was pre-validated on a Development Computer, and now reflects the configuration localized to a specific remote host. For full details on passwords and the password-derived secret key localization process, please review the rfc3414.

8.2 A content of a minimal NDMPDynConfig.xnv file leading to a working SNMPv3 Service configuration in a remote host

The minimal **NDMPDynConfig.xnv** file presented below provides for updates of the following parameters on the remote host to achieve a working remote SNMPv3 Service configuration.

1. a new Engine ID value, derived from the remote host's MAC address.
2. updates of the snmpCommunityTable's original Context Engine ID entries to the new Engine ID.
3. updates of the usmUserTable rows, with the user row information provided by the **NDMPDynConfig.xnv** file, in the format as per the example below. The default action will first remove all rows, previously pushed out via NDMPCfg64.reg file, from the usmUserTable.
4. optional new SysNameMode & SysDescrMode values are set to the current host info.

A minimum **NDMPDynConfig.xnv** file should contain:

```
[DynConfig]
   EngineIdGenMode=3  ; uses remote host MAC address as a seed value for new Engine ID
   USMGenMode=1  ; replaces current, usmUserTable entries with the entries provided below
   SysNameMode=1  ; provides for values to be set to the current host info
   SysDescrMode=1   ; provides for values to be set to the current host info
[DynUsmUserTable]
   ; the three example rows below, must be equal to those pre-tested using Development Computer's
   usmUserTable entries, and must contain their associated GroupNames.  These rows will undergo
   password-to-key changes with the new EngineID localization process.
   ; index=UserName AuthProtocol PrivProtocol AuthPass PrivPass GroupName
   1=Tester SHA(3) DES(2) "AuthPassword"  "PrivPassword" "Admin"
   2=Bob MD5(2) 3DES(7) "AuthPassword" "PrivPassword" "GrpAll"
   3=public none(1) none(1)  "" "" "grpReadOnly"
```

Summarizing, the above usmUserTable entries will replace the remote host's existing usmUserTable rows, that were preconfigured during the Development Computer's configuration process, then pushed to all remote hosts with the content of the NDMPCfg64.reg file. The "new rows" are provided in a "to be processed format", to allow for the "localization" process, using the new Engine ID, to take place. The correct GroupNames of the Development Computer working configuration must also be provided to ensure compatibility with the SNMPv3 Service releases and their **NDMPDynConfig.xnv** files, prior to Service release 16.10.

This document is provided for informational purposes only, 'as is' and without warranty of any kind, using it you are consenting to NuDesign SNMPv3 Agent Service for Windows License Agreement. This document may be copied, however without any modification, all pages, full text and notices must be included.

9. About NuDesign Technologies

NuDesign Technologies, Inc, based in Toronto, Canada, specializes in the development of SNMP management agents and client applications used in remote configuration, monitoring and control of Windows and Linux Servers & Workstations, embedded devices, networking services and applications.

For all of our software products, supporting standard management protocols such as NETCONF, SNMP, CLI and web protocols such as RESTCONF, please visit our main site at www.ndt-inc.com.

The benefits of deploying NuDesign's management software technologies are reliable, low risk, quick-to-market and well supported solutions. The highly automated code generation tools with associated applications and tutorials enable fast prototyping and development. They also facilitate organization and design process for multiple target environments.

Contact Information

NuDesign Technologies, Inc.
tel: 416 737 0328 / fax: 416 445 9101
toll free: 1 866 886 SNMP (7667)
contact@ndt-inc.com
www.ndt-inc.com / www.snmp4windows.com

This document is provided for informational purposes only, 'as is' and without warranty of any kind, using it you are consenting to NuDesign SNMPv3 Agent Service for Windows License Agreement. This document may be copied, however without any modification, all pages, full text and notices must be included.