NComputing™

N-series Thin Clients
for Citrix HDX

User Manual

(Firmware 1.5.0)

Important Notices

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www.ncomputing.com

Refer to the Limited Hardware Warranty applicable to your region for information on what is and what is not covered by the warranty, your responsibilities, exclusions, and how to obtain service. It is your responsibility to download a copy of the warranty at the time of purchase to keep for your records. The warranty can be downloaded from the "Documentation" page in the Support section of the NComputing website.

This product gives users shared access to computer resources. It is not a computer, and may not support all software applications, especially high-resolution graphics applications or 3D games that are designed to be supported by stand-alone computers. Similarly, it may not support all hardware peripherals that are designed to be supported by stand-alone computers.

Refer to your computer operating system and application software vendors' license agreements for information on using these products with NComputing systems. Additional software licenses may be required.

The NComputing hardware and software products described in this user manual are protected by numerous granted and pending U.S. and international patents. Some components of NComputing products utilize open-source software. Please refer to the GPL Declarations section of this User Manual for more information.

Your N-series purchase was bundled with an entitlement to vSpace Management Center and Premium Support

Review section 4.1 of this manual to learn more about claiming your vSpace Management Center license(s) and access to NComputing Premium Support.

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Regulatory Compliance

FCC Information

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the receiver
- Connect the equipment to a power outlet on a circuit different from which the receiver is connected
- Consult your dealer or an experienced radio TV technician for help

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

European Community:

Disposal Information:

This symbol means that according to local laws and regulations your product should be disposed of separately from household waste. The separate recycling of your product will help ensure that it is recycled in a manner that protects human health and the environment.

GPL Declarations

The NComputing N-series access device contains – in part – some free software (software licensed in a way that ensures your freedom to run, copy, distribute, study, change and improve the software). This free software is also contained in the N-series firmware update files that are distributed online. The free software contained within the N-series firmware includes a version of X-LOADER, U-BOOT, LINUX, LIBSYSFS, LIBUCI, LIBUSBIP, ETHTOOL, UCLIBC, QT and BUSYBOX.

Further, for at least three (3) years from the date of distribution of the applicable product or software, we will give to anyone who contacts us at gplcoderequest@ncomputing.com, for a charge of no more than our cost of physically performing source code distribution, a machine-readable copy of the complete corresponding source code for the version of the software that we distributed to you. For additional information refer to this page on the NComputing website: www.ncomputing.com/gplcodedownload

Safety Information

Refer to the following to prevent any physical injury or loss of assets caused by damage to the product.

A user must read this User Manual carefully before use and properly follow the instructions.

- Make sure that the place of installation is not too hot (above 35˚C), too cold (below 0˚C), or too wet (above 85% relative humidity).
- Avoid any severe impacts to the product
- Make sure that the product is not exposed to direct sunlight or any hot machinery.
- Please keep the product away from any items which have strong magnetic properties.
- Do not disassemble, repair or rebuild the product.
- Please properly route all cables and power cords to avoid a tripping hazard. An electric shock, fire, damage to the product or physical injury may occur as a result of tripping over the cable.

1.0 N-series Overview

The NComputing N-series HDX-ready Citrix access device utilizes powerful third-generation Numo™ 3 System on Chip technology to deliver a high-performance, affordable client for Citrix environments. This user manual will walk you through the differences between each of the different N-series models and explain their basic functionality.

1.1 N-series models

The N-series is available in three distinct versions; the N400, N500, and N500w. The entry level N400 is the thin client of choice for task workers and those workers with light multimedia needs. The N500 adds client-side video rendering to enable the delivery of full 1080p multimedia content, improved network capabilities, as well as options for dual monitor and wireless connectivity.

	N400	N500	N500w
	N400	N500	N500w
Network Bandwidth	10/100/1000	10/100/1000	10/100/1000
Onboard Memory	512 MB	1024 MB	1024 MB
Video Playback	720p	1080p	1080p
4x USB 2.0 Ports	✓	✓	✓
DVI Video Output	✓	✓	✓
Optional Dual Monitor Support		✓	✓
Wireless Network Connectivity			✓

NOTE: The N500w supports secured wireless networks with visible SSIDs using WPA or WPA2.
On-device memory is reserved for use with NComputing-supplied and approved firmware only.

1.2 N-series Package Contents

When you unpack your N-series device, you will find the following items: N-series device, N-series Quick Installation Guide, VESA Mounting bracket with screws, and 12V Power adapter.

1.3 N-series Peripheral Connections

Each of the different models within the N-series lineup feature the following peripheral options listed below from left to right in order of appearance on the device.

Front

Back

Front of Device

Power On/Off/Reset Switch
2x USB 2.0 Ports
Analog Speaker Port
Analog Microphone Port

Back of Device

Wireless Network Antennae (N500w only)
2x USB 2.0 Ports
RJ45 Ethernet Port
DVI Monitor Port
12V DC Power Port
Kensington Security Lock

1.4 VESA Mount

Included with each N-series device is a VESA mount which can be used to attach the N-series device to the back of any VESA compatible monitor, as shown below.

Optional VESA Mount
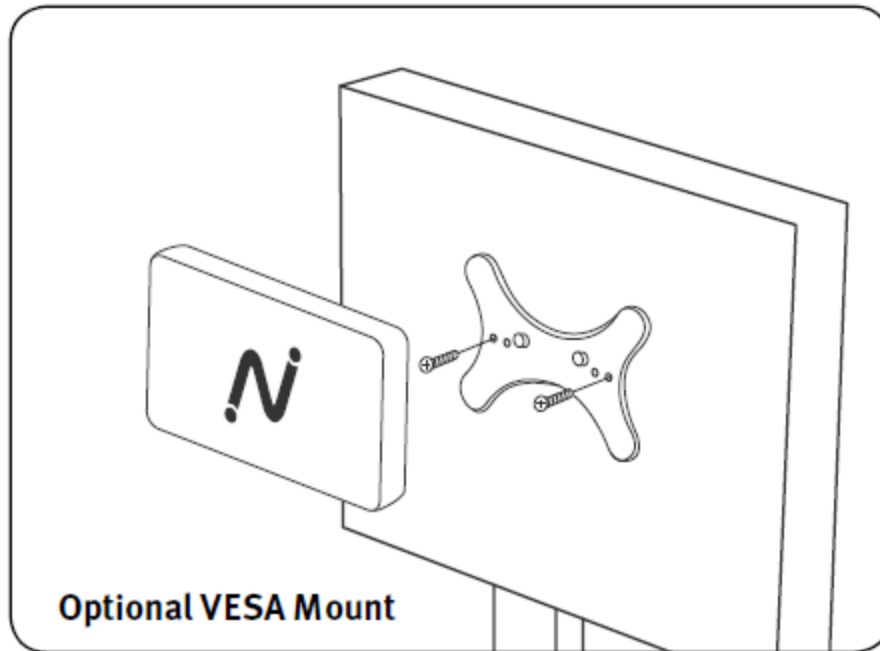
1.5 Citrix Requirements

To utilize the N-series device, you will need access to a Citrix environment. The N-series is compatible with the following Citrix environments:

- XenDesktop versions 5.0, 5.5, and 5.6
- XenApp versions 6 and 6.5
- VDI-in-a-box 5.0 and 5.1

For more information on the installation and configuration of Citrix environments, visit http://www.citrix.com/lang/English/home.asp

1.6 Secondary Display Adapter

For deployments requiring two monitors per user, NComputing offers the N-series Secondary Display Adaptor. This accessory is offered in VGA and DVI models and is optimized for use with productivity applications and 2D graphics content.

The Secondary Display Adaptor makes use of DDC interface technology, allowing it to automatically scale its output to the full native resolution of most monitors. This default resolution can be changed from within the N-series settings menu, under the Preferences -> Display Tab.
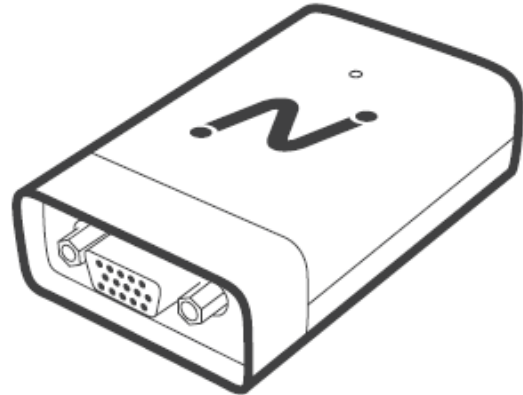
Installing the Secondary Display Adaptor

1. With the N-series powered off, connect the Secondary Display Adaptor to the lower USB port on the back of the device. This USB port is marked with a keyboard symbol.

    Note: You can relocate your USB keyboard to either of the USB ports on the front of the N-series. If you have run out of USB ports, a powered USB hub can be connected to either of the USB ports on the front the N-series device to support additional connections.

2. Connect your second monitor to the Secondary Display Adaptor and turn it on.

3. Turn on your N-series device.
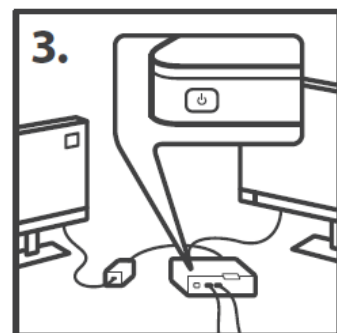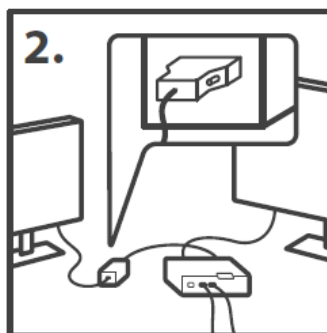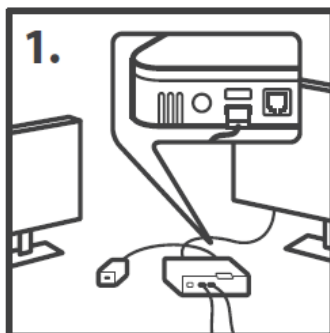
2.0 Device Configuration

It is strongly recommended that before connecting your N-series for the first time, you review the configuration options to ensure that they conform to the needs of your environment.

You can reach the configuration screen by clicking the gear icon to the bottom left of the initial Log-in screen. Next to the gear icon is a dropdown that will allow you to change your keyboard layout to match a number of regional and national standards, as shown above.

Once in the configuration screen, you can return to the Log-in screen at any time using the "Home" button. Remember to SAVE your configuration changes as you apply them using the "Save" button to the bottom left of the configuration window.

2.1 Citrix Tab

The Citrix tab is used to point your N-series device to your XenDesktop Services Site as well as configure certain login and application behaviors.

- **Auto-configure (DHCP)***
  Instructs the N-series device to obtain XenDesktop Services Site information automatically via DHCP (requires that you configure your DHCP server to distribute this information). If this feature is disabled, use the Name/URL field to manually enter the IP, URL, or Fully Qualified Domain Name of your XenDesktop Services Site.

- **Use Citrix Access Gateway**
  Enabling this feature will allow your N-series device to access your Citrix environment securely from outside your network via the Citrix Access Gateway.

- **Auto-launch if only one application is published**
  If your Citrix environment is configured to only publish a single application to the user session obtained by a given device, you can use this feature to automatically launch that application or desktop on login.

- **Auto-logoff on last application quit**
  Enabling this feature will cause your N-series device to automatically log out if all applications are closed.

- **Password required for unlocking this device upon wakeup**
  Enabling this feature will cause your N-series device to prompt the user for their login password when the device comes out of a standby state.

- **Auto login / kiosk**
  Use the Username, Password, and Domain fields to configure your device for auto login. The Application field can be used to enter the name of an application (as it appears when published by XenApp) to be automatically launched on login.

- **Enable username caching at login**
  Enabling this feature will leave the user name of the last user to log in cached in the user name field after they log out. This can speed up the login process when a single specific user is most likely to use a given device.

2.2 Preferences Tab - Display

The Display section of the Preferences Tab is used to manage monitor resolution and standby settings.

- **Resolution Settings**
  Use the Resolution dropdown menu(s) to select your desired monitor resolution.

- **Screensaver Delay**
  The N-series can be instructed to turn off its video signal after a predefined period of idle time.
  Use this slider to enable this feature and define the desired idle period.

2.3 Preferences Tab – Date/Time

The Date/Time Tab is used to set the internal clock of the N-series device.

- **Timezone**
  Select the appropriate time zone from this dropdown menu.

- **Set date/time automatically**
  Enables the use of the NTP service to obtain automatic date/time information via your network.
  If disabled, the date and time can be manually configured using the fields to the right side of the
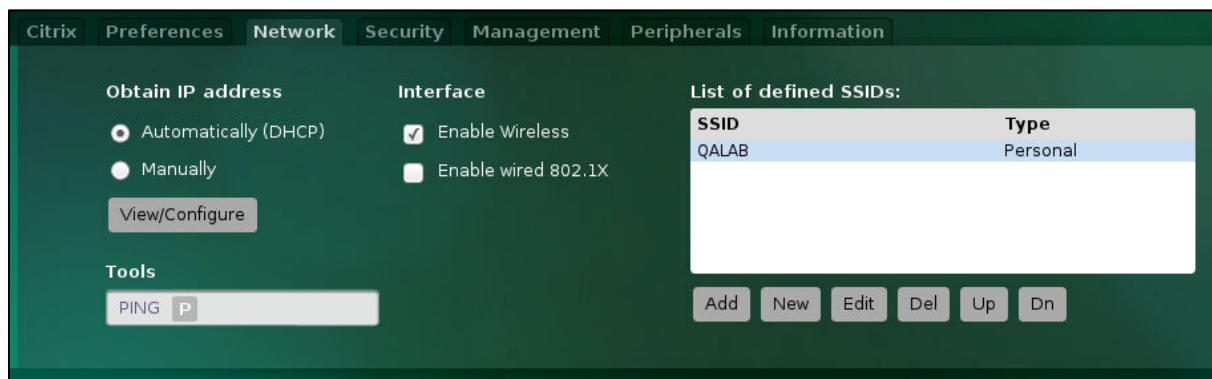 menu.

2.4 Preferences Tab – Keyboard

The Keyboard Tab provides access to localized keyboard layout support.
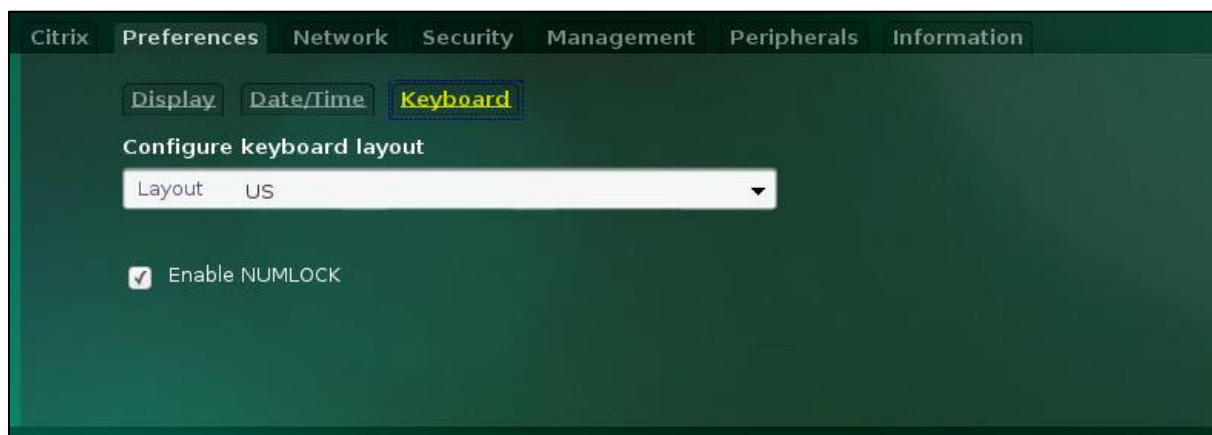
- **Layout Dropdown**
  Select the desired keyboard layout (by country) from this dropdown menu.

- **Enable NUMLOCK**
  When enabled, the NUMLOCK key will be on by default when the device turns on.

2.5 Network Tab

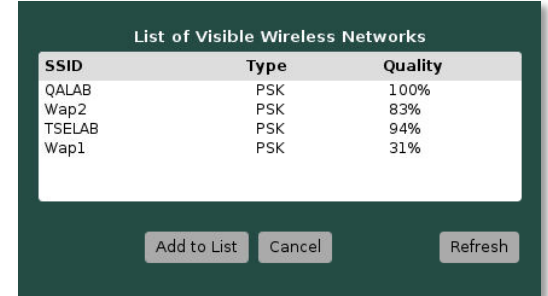The Network Tab allows configuration of N-series device network settings.

- **Obtain IP address**
  Select whether to obtain network settings via DHCP, or enter network settings manually using the fields provided to the right of this menu. The View/Configure button allows you to view the current network connection information or, if using a manual configuration, to modify the current settings.

- **PING**
  This feature allows the user to test an IP address to determine whether it is in use before assigning it to the N-series device. This can also be used to verify general network functionality.

- **Interface**

    N500w model devices feature wireless connectivity, and this mode can be enabled by selecting the Enable Wireless checkbox. When checked, a list of defined SSIDs will appear to the right of the Network tab containing all currently configured SSIDs. Below this list are several buttons, outlined below:

    - **Add**

        The Add button below the list of defined SSIDs allows users to view all currently visible SSIDs accessible by the N-series device, and add one of them to it's list of defined SSIDs via the menu pictured at right.
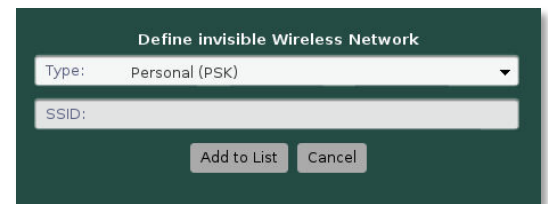
    - **New**

        The New button below the list of defined SSIDs allows users to define a new SSID, separate from those currently visible to the device, via the menu pictured at right.
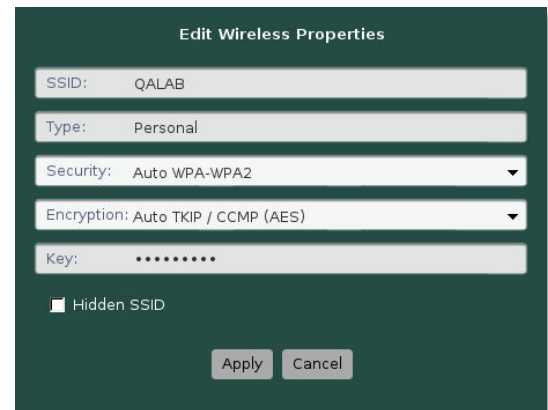
    - **Edit**

        The Edit button below the list of defined SSIDs allows users to fully configure an SSID added via the New button. Select the defined SSID in question, press the Edit button, and the following menu interface at right will be displayed.

        Consult your network administrator for settings and values appropriate for your wireless environment.

- **Enable Wired 802.1X**

    All N-series devices running firmware 1.5.0 or newer can make use of wired 802.1X by checking the Enable Wired 802.1X option in the center of the Network Tab. Once checked, a new configuration button appears below the checkbox allowing you to specify your 802.1X settings using the menu pictured at right.

    As with the wireless settings, if you are uncertain of the values displayed in this menu, consult your network administrator for the appropriate settings.

2.6 Security Tab – Per-Tab Access

The Per-Tab Access section of the Security Tab allows administrators to lock specific tabs within the N-series device GUI.

- **Administrator Password**
  Enabling this feature allows the administrator to restrict access to specific tabs within the N-series GUI by prompting for the password entered in the password field.

- **Lock Tabs**
  Each of the N-series configuration tabs can be individually selected and locked using the checkboxes provided within this menu.

2.7 Security Tab – Certificates

The Certificates section allows users to add and view Server and Client security certificates.

- **Server (Root CA)**
  Selecting this option displays Server (Root CA) certificates in the certificate list.

- **Client (PKCS#12)**
  Selecting this option displays Client (OKCS#12) certificates in the certificate list.

- **URL/Name, Add, Remove**
  Certificates can be added to or removed from the device using the URL/Name, Add and Remove buttons

2.8 Security Tab – Imprivata

The Imprivata section of the Security Tab can be configured to allow for login via RFID cards and readers using Imprivata's OneSign technology. For more information on Imprivata OneSign integration, review the following integration guide: http://www.ncomputing.com/kb/HOW-TO-Imprivata-OneSign-Integration_409.html
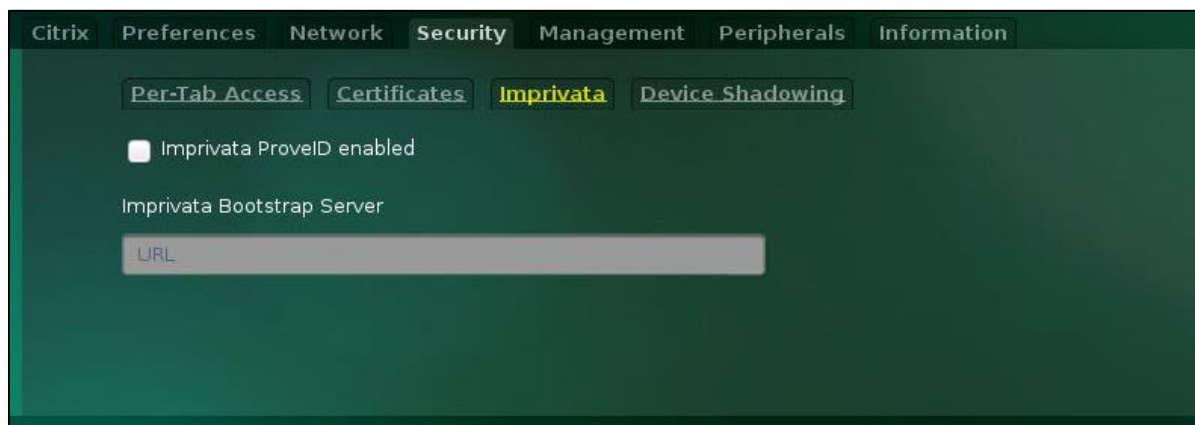
- **Imprivata ProveID enabled**
  This setting can be used to enable or disable the use of RFID cards and readers to login into and out of Citrix accounts.

- **Imprivata Bootstrap Server**
  This field is used to specify the location of the Imprivata Bootstrap Server, a required setting for the use of Imprivata OneSign.

2.9 Security Tab – Device Shadowing

The Device Shadowing feature allows N-series devices to be viewed and controlled by VNC clients.
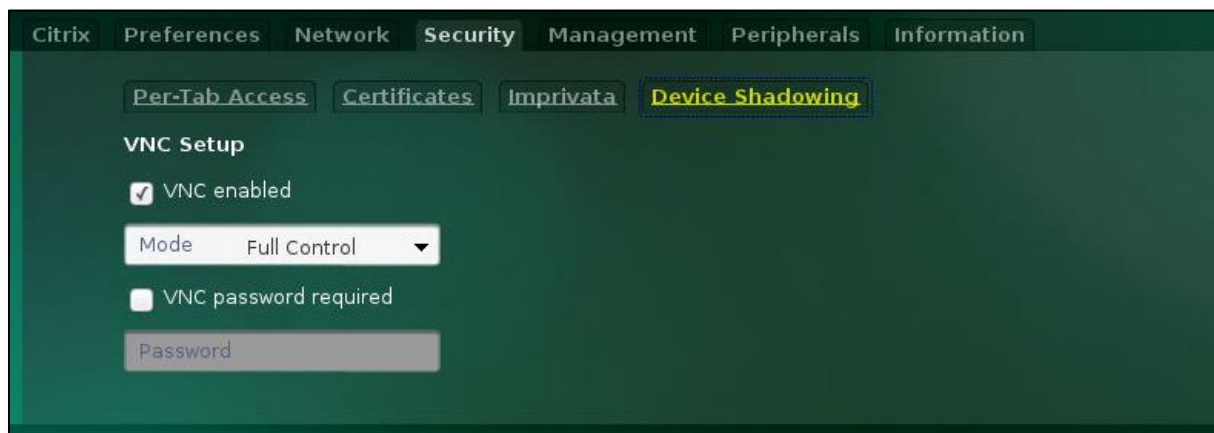
- **VNC Setup**
  With VNC enabled, the Mode dropdown can be used to determine how much control the VNC session is allowed over the N-series device. The VNC Password Required option allows the N-series device to prompt connecting VNC clients for a password.

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2.10 Management Tab – Device Name

The Device Name section of the Management Tab allows administrators to name their N-series devices.
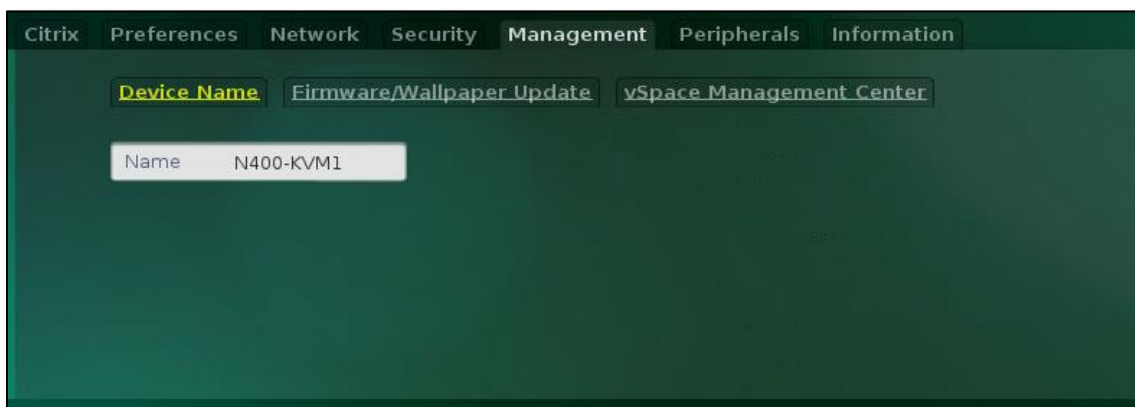

- **Name**

  Naming an N-series device can make sorting and locating devices within a deployment more expedient. For example: device names can include a room number, floor, department, or user name. Note that your DHCP server is provided this name to associate with the IP address assigned to the N-series device.

2.11 Management Tab – Firmware/Wallpaper Update

The Firmware/Wallpaper section of the Management Tab allows administrators to control how, when, and from where N-series devices acquire firmware and wallpaper updates.
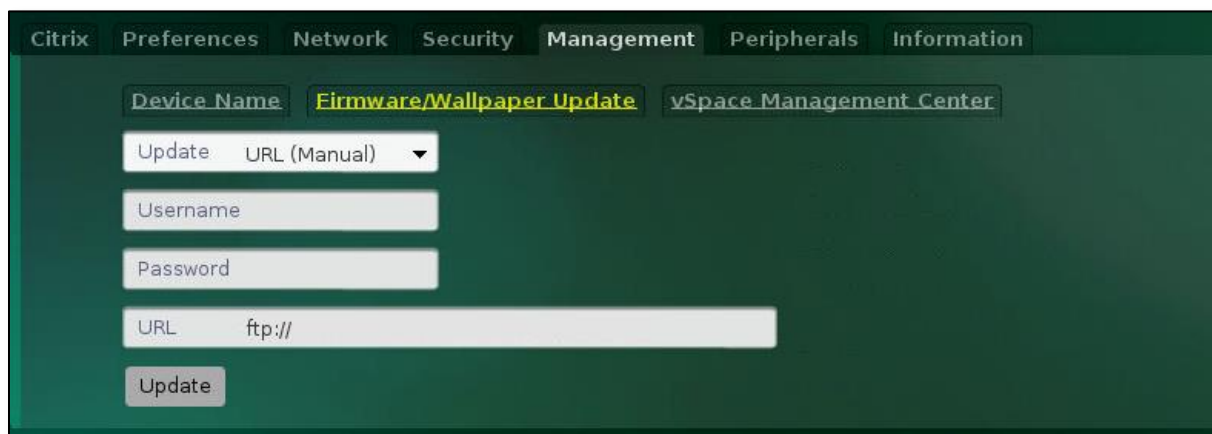
- **Update**

  DHCP (Automatic) will check your DHCP server for a firmware path*. URL (Automatic) will check a specified URL at startup. URL (Manual) requires that the Update Firmware button be pressed to initialize an update.

  NOTE: DHCP (Automatic) and **URL (Automatic)** require firmware version 1.4.1 or newer.

- **Username / Password**
  Enter the username and password of the FTP server you've stored your updated N-series firmware on.

- **URL**
  Enter the URL of the FTP server you've stored your updated N-series firmware or new background image on.

- **Update Button**
  Once you've specified the above information, press the Update button to begin a firmware update.

*Note: You can configure your DHCP server to automatically provide your N-series device(s) with vSpace Management Center server information. This eliminates the need for you to manually configure this setting for each device. Review section 4.3 DHCP Options for Automatic N-series Configuration for more information.

2.12 Management Tab – vSpace Management Center

The vSpace Management Center section of the Management Tab allows administrators to manage the device's connection to vSpace Management Center servers.
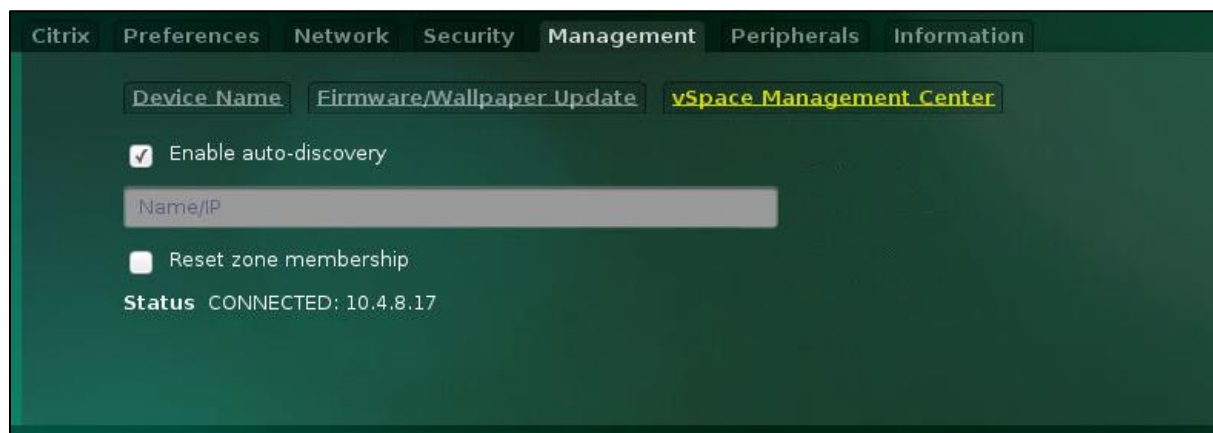
- **Enable auto-discovery**
  Instructs your N-series device to automatically search for and connect to vSpace Management Center servers within its subnet.

- **Name / IP**
  Here you can manually enter the IP or Fully Qualified Domain Name of a vSpace Management Center server within your network.

- **Reset zone membership**
  Enabling this feature will clear any previous zone membership information as the device joins a new vSpace Management Center server.

- **Status**
  This field provides basic information regarding the device's current Management Server status.

2.13 Peripherals Tab – Redirection Policy

The Redirection Policy section of the Peripherals Tab allows administrators to enable and disable alternate methods of USB peripheral behavior.

- **Audio**
  A number of specific deployment types, such as those including call centers that rely on USB headsets to deliver microphone input to certain applications, will benefit from enabling Audio redirection. Note that while enabled, users may experience reduced audio playback quality when playing video or browsing multi-media intensive websites.

- **Printer**
  Enabling printer redirection can resolve issues with certain printer specific OEM applications within XenDesktop.

2.14 Peripherals Tab – Audio

The Audio section of the Peripherals Tab offers controls for audio input and output.
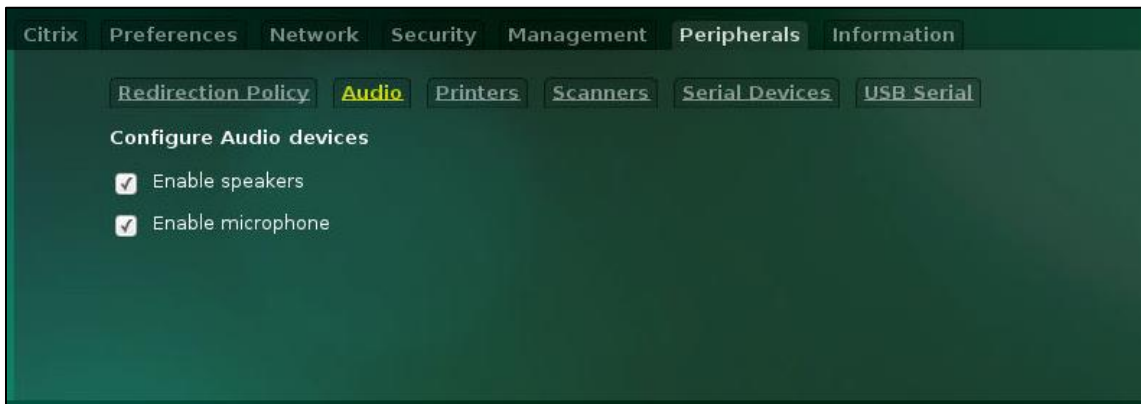
- **Configure Audio Devices**
  The checkboxes within this section of the menu control speaker (audio out) and microphone (audio in) functionality on the N-series device.
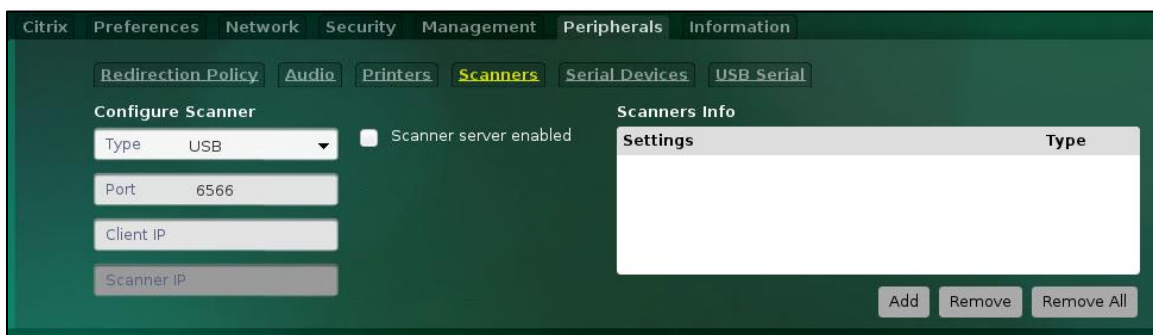
2.15 Peripherals Tab – Printers

The Printers section of the Peripherals Tab can be used to associate printers with the N-series device.

- **Configure Printer**
  Printers can be added to the N-series device using the drop down menus to select printer Type, Make, and Model.

- **Printer Info**
  Multiple printers can be associated with a given device at any given time. All currently associated printers are listed within this field. R**ight-clicking** within this field displays the CUPS (Citrix Universe Print Server) name of associated printers.

2.16 Peripherals Tab – Scanners
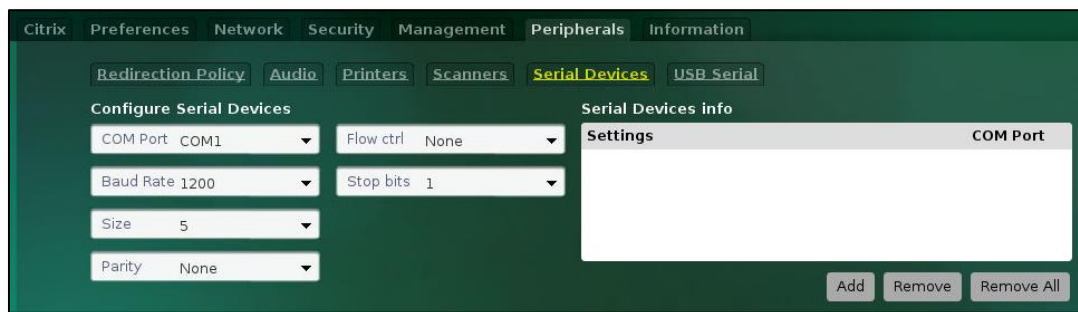
The Scanners section of the Peripherals Tab can be used to associate SANE compatible scanners with the N-series device.

- **Configure Scanner**
  Using the Type dropdown, Port, Client IP, and Scanner IP fields (if applicable) allow the administrator to specify USB and network printers for association with the N-series device.

- **Available Scanners**
  Multiple scanners can be associated with a given device, and all currently associated scanners are listed within this field.

2.17 Peripherals Tab – Serial Devices

N-series devices support the use of serial devices* over USB. This is one of two menus that allow administrators to configure N-series devices for use with serial peripherals.

- **Configure Serial Devices**
  The COM Port, Baud Rate, Size, Parity, Flow Ctrl, and Stop Bits drop down menus are used to configure a given serial device for use with an N-series access device. Consult the peripheral user manual for guidance on the values that should be used.

- **Serial Devices Info**
  Multiple serial devices can be associated with a given device, and all currently associated devices are listed within this field.

2.18 Peripherals Tab – USB Serial

The USB Serial Tab is the second method of associating serial devices* with N-series access devices.

- **Configure USB Serial**
  The vid:pid field can be used to add serial devices over USB by specifying the Vendor and Product ID of the device. Consult the peripheral's user manual for guidance on the values that should be used in this field.

- **USB Serial Devices Info**
  Multiple serial devices can be associated with a given device, and all currently associated devices are listed within this field.

  *Note: The N-series supports PL2303 and FTDI compatible serial-to-USB adaptors only. Consult the adaptor's user manual or vendor to confirm compatibility.

2.19 Information Tab

The Information Tab servces as a reference point for several key points of information including Network , Device, Firmware, and Management details.

- **Device Information**

  This field contains Device Name, Model, and Serial information. Also included in this section are the wired and WiFi MAC addresses associated with the device.

- **Firmware Information**

  Listed within this field is the version number for firmware currently running on the N-series device as well as the current Citrix Receiver version.

- **Network Information**

  This field lists the current device IP address, Netmask, Gateway, and Ethernet MAC address. This information, with the exception of the MAC address, is updated whenever settings within the Network Tab are changed.

- **vSpace Management Center**

  The current connection status and IP address of the vSpace Management Center server associated with the N-series device can be seen within this field. This field mirrors the status field at the bottom of the vSpace Management Center section of the Management Tab.

- **Log Info**

  The Log Info button brings up a time-stamped activity log displaying the most recent events to occur within the N-series device. This log can be useful for troubleshooting purposes or validating events, and can be saved to a USB storage device.
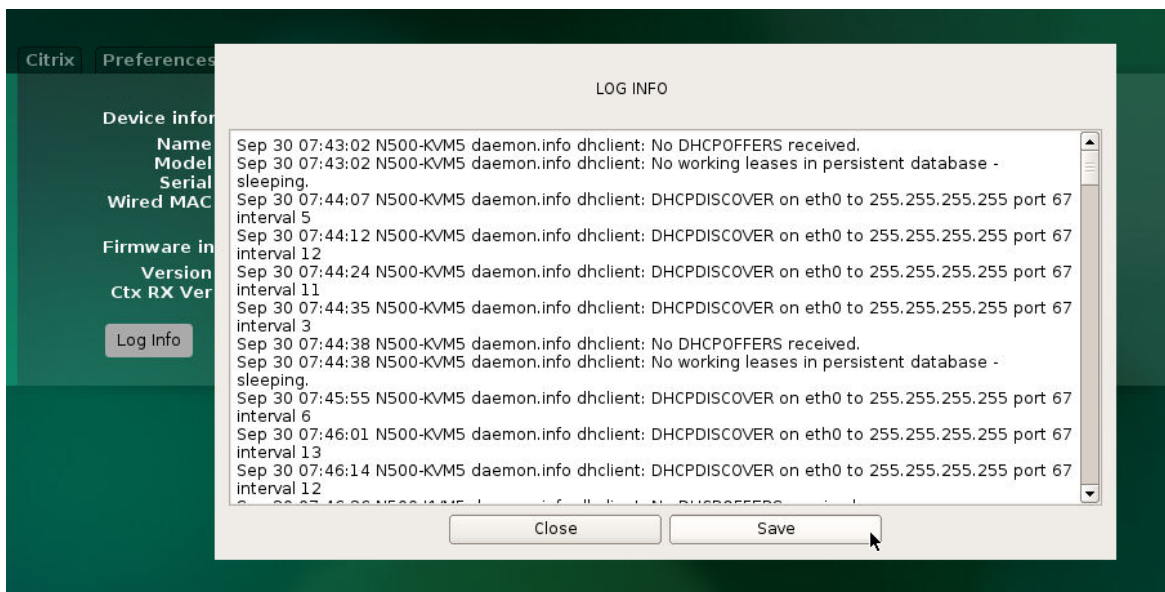
Saving N-series Log Files

To save an N-series Log file, follow these steps:

1. **Connect a USB storage drive** to any USB port on the N-series access device.
2. Access the Log menu from the Information Tab of the N-series device as outlined above.
3. From the Log menu, click "**Save**" button.

Additional Log File Details

- The Log File is a standard, Linux log file in text format.
- The first 8 digits of the Log File name is a time stamp, using the YYYY/MM/DD format.
- Each entry in the Log File is time stamped.
- The N-series continually stores activity in the log file. This process does not need to be initiated manually.
- The Log File is recorded in a 256KB buffer which is automatically cleared when it reaches capacity, meaning that the data saved at any given moment represents the most recent activity since the last buffer clear.

3.0 Connecting to your Citrix Environment

From the initial Log-in screen, enter the User Name, Password, and Domain information of the Citrix Environment you wish to connect to. Once this information is entered, press the "LogOn" button.

Once you've logged into your Citrix environment, you'll be presented with a standard Citrix desktop layout as shown below. From this screen you can return to the Log-in screen by clicking "**Log Off**" towards the top of the window. You can lock your desktop using the "**Lock**" button, and unlock the desktop using the same password you used to log into your Citrix environment. The **search bar** at the top of the window can be used to locate applications available to your Citrix environment.

The "**Home**" icon on the left side of the screen returns you to this default desktop layout. The "Apps" icon allows you to browse through available applications and environments. Click the "Add Apps" button in the center of the screen to create shortcuts for available applications and environments. You can quickly switch between open applications by holding **CTRL+ALT** and then pressing the **UP** or **DOWN** key.

4.0 Support and Additional Resources

4.1 Accessing your vSpace Management Center License(s) and Premium Support Entitlement

Your N-series thin client was bundled with an entitlement to receive the NComputing vSpace Management Center software along with one (1) year of Premium Support. To activate these entitlements follow these steps:

1. Go to: http://www.ncomputing.com/enroll

    a. If you already have an account on ncomputing.com – login at the prompt and fill out all the fields.

        - If you do not have an account – follow the links to create an account (this also gives you access to various resources including posting on the NComputing Community) - make sure you enter your e-mail address correctly as this will be used to deliver your licenses and entitlement information

        - Return to the http://www.ncomputing.com/enroll page and fill out all the fields

    b. Click "Submit"

2. You will receive an e-mail confirmation immediately after your submit your request.

3. Within 2 business days you will receive an e-mail that includes:

    a. License key(s) for activating your vSpace Management Center installation (see vSpace Management Center user manual for details)

    b. Link to activate your Premium Support entitlement.

You will now have everything you need to begin taking advantage of your Premium Support account as well as the remote management features of vSpace Management Center.

4.2a Pre-1.5.0 Firmware Update Best Practices

N-series firmware versions prior to 1.5.0 are designed to be applied sequentially, with each new build applied to the previous build in order of their release. Administrators can manually step a device through sequential firmware updates if desired, or they can configure the devices to perform a sequential update automatically.

> **NOTE:** If a device is updated out of sequence and ends up skipping a firmware build, administrators can simply downgrade the device and reapply the firmware update process from beginning to end. Furthermore, once the initial step of downgrading a device to firmware version 1.1.1 (the first public firmware build), the remainder of the update process can be automated, as outlined below.

Requirements for Automatic, Sequential Updates

An automatic update requires that the devices be set to either of the "automatic" (DHCP* or URL) update modes (found in **Firmware/Wallpaper Update** section of the **Management Tab** in the N-series GUI) and pointed to a network accessible folder** that contains each of the required firmware builds. The folder should contain the desired firmware files themselves as well as a catalog.txt file, as pictured below:

Catalog.txt	Text Document	1 KB
Nxxx_FW_ver_1_1_1_1.tar.gz	GZ File	83,785 KB
Nxxx_FW_ver_1_2_0_1.tar.gz	GZ File	84,763 KB
Nxxx_FW_ver_1_3_7_2.tar.gz	GZ File	77,207 KB

The catalog.txt file functions as a table of contents for the update service; listing each of the firmware builds in a given archive in the order that they were released. Below is an example of the contents of a catalog.txt file that contains information for three firmware builds, ranging from build 1.1.1 to build 1.3.7.

```
Nxxx_FW_ver_1_1_1_1.tar.gz0 0 0 1 1 1 1 02e90025e8239722e58b62b3a9b92386
Nxxx_FW_ver_1_2_0_1.tar.gz0 0 0 1 2 0 1 945434214db5285596a24404a637471d
Nxxx_FW_ver_1_3_7_2.tar.gz0 0 0 1 3 7 2 a4f5dcdeb8de66aaabfe804fc3a5ee93
```

Each new firmware build is released with a catalog.txt file containing a single line. The above catalog.txt file contains three lines because it was written for an archive that contains three firmware builds. In the event that a new firmware build was released, the archive could be updated by adding the firmware file itself to the folder, and copying the catalog.txt line included with that firmware into the archive's catalog.txt file. In this case, the next firmware build would add a fourth line.

* Note that using the DHCP setting requires that DHCP tags be configured with the appropriate FTP information. See section 4.3 of this manual for more information on this feature.

** If a network accessible folder is not available, or assistance is needed to set up such a resource, an example is given using FileZilla at the end of this guide.

4.2b 1.5.0 Firmware Update Best Practices

As of version 1.5.0, each new N-series firmware release will include two firmware files.

The first, intended for use as a single-version, sequential update, works exactly as previous firmware versions. That is, as an update from the last official release to the current release. The second file, intended as a complete, standalone install of the current firmware, can be used to update a device that is several versions behind the current release version in a single step; without the need to progress through each previous version in the order of their release.

This new system offers new flexibility and streamlines the firmware update process when devices are several versions behind the current release, while retaining the ability to perform rapid, single version updates using minimal file sizes when possible.

The following sections will outline some of this new functionality and provide administrators with detailed installation steps for implementing firmware 1.5.0 using a number of different install methods.

Identifying the new firmware files:

The single-version update file and full, standalone update file are differentiated by the first set of digits in their version number. The full update's value is incremented by 100, while the remaining digits remain identical. For example:

- **Nxxx_FW_ver_1_5_0.tar.gz**

    single-version sequential update, for use with the previous official release.
- **Nxxx_FW_ver_101_5_0.tar.gz**

    full update, usable when a device is several versions behind.

Note that both of these files should be added to your firmware repository before updating to 1.5.0. Administrators must only direct their devices to the Nxxx_FW_ver_1_5_0.tar.gz file (not the 101.5.0 file). The firmware will automatically use the full update file if the update in question spans more than two versions.

Installing 1.5.0 via N-series GUI

When installing 1.5.0 on a device for the first time using the device GUI, follow these steps:

1. Ensure both of the firmware files (sequential and full) have been uploaded to an FTP accessible folder. If you are unfamiliar with this process, consult the FileZilla example in the following KB document: http://www.ncomputing.com/kb/afile/370/342/

2. From the N-series GUI, under the Management -> Firmware/Wallpaper Update Tab, select the URL (Manual) update type and fill out the URL field, using the FTP address of the firmware file. (again, this will be the 1.5.0 file, not the 101.5.0 file)

   This step is essential. The FTP URL must be pointed at the 1.5.0 file. In the event that DHCP tags are being used, ensure that the DHCP tags have been updated to point at this same file.

3. Once the URL field has been populated, you can perform the firmware update using the method of your choosing (URL Manual, Automatic, DHCP, etc.).

Installing 1.5.0 via USB Drive*

When installing 1.5.0 on a device for the first time using a USB memory device, follow these steps:

1. Copy the catalog.txt and Nxxx_FW_ver_1_5_0.tar.gz files to the USB storage peripheral and connect it to the N-series access device.

2. From the N-series GUI, under the Management -> Firmware/Wallpaper Update Tab, select the USB (Manual) update type and fill out the URL field, using the directory location of the Nxxx_FW_ver_1_5_0.tar.gz file from step 1.

3. Once the URL field has been populated, you can perform the firmware update.

*NOTE: USB update requires firmware 1.4.1. Feature not present in older versions.

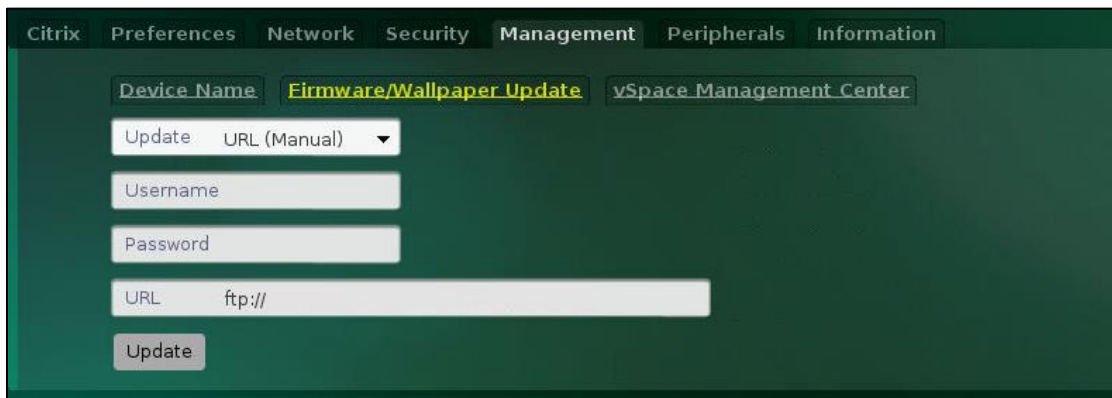## Installing 1.5.0 via vSpace Management Center

When installing 1.5.0 on a device for the first time using vSpace Management Center, start by verifying that all VMC servers within the Managed Zone have been fully updated to VMC version 3.3.1. Once that's done, follow these steps:

1. Ensure that the full update file has been uploaded to an FTP accessible folder (this is the 101.5.0 file), and that the sequential update file (1.5.0) has been added to VMC's firmware repository. If you are unfamiliar with hosting files via FTP, consult the FileZilla example in the following KB document: http://www.ncomputing.com/kb/afile/370/342/

2. From VMC, push a profile update to the device(s) in question, setting the FTP URL value in the firmware update tab to that of the full update file location (this is the 101.5.0 file).

3. Once the profile push has completed successfully, you can initiate a firmware update from vSpace Management Center to 1.5.0 using the Device Management -> Update firmware menu.

4.2c Directing N-series Devices To The Firmware Archive Using the N-series GUI

Once a folder or archive is set up with the above listed requirements, administrators can configure their N-series devices on a per-device basis if desired. This process is outlined in the steps below.

1. From the **Manage Profiles** menu, select the N-series profile you wish to edit. If an N-series profile does not already exist, use the steps outlined in Section 4.5 of this manual to create a new profile for the devices you wish to update.

2. Navigate to the Management Tab, and then select Firmware/Wallpaper Update (pictured below).

3. Using the **FTP, User, and Password fields**, enter the FTP location of the newest firmware build within the archive you have created. (this will be a file ending in .tar.gz)

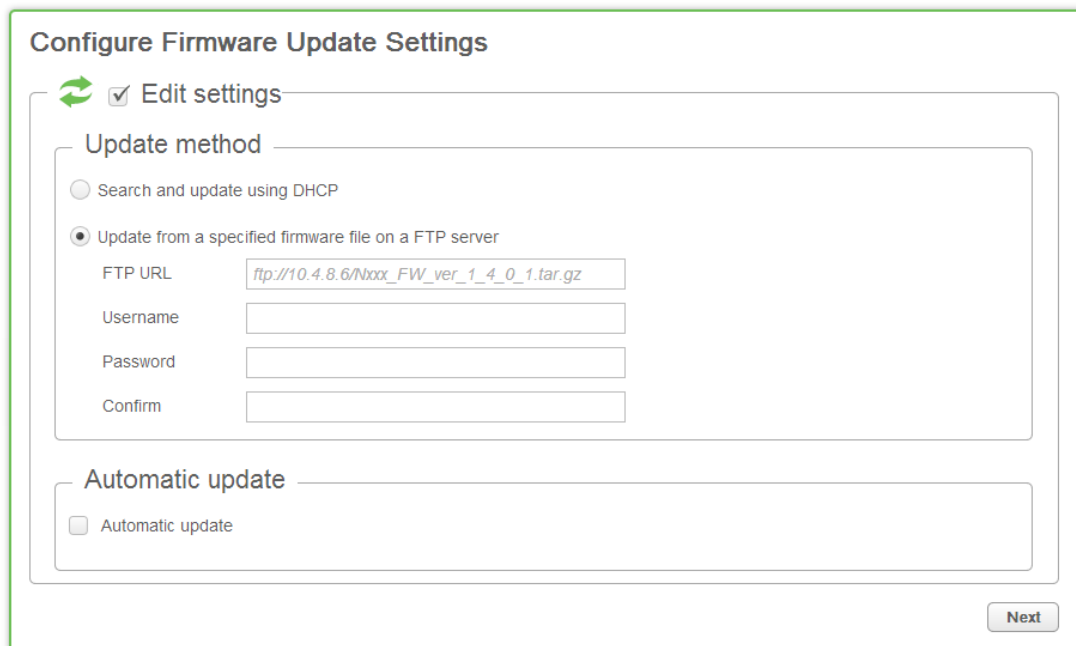4. When finished, click the **Update** button to begin the sequential update.

At this point the device will begin the process of updating to the newest version of firmware available within the archive you have created, proceeding through each of the intervening builds between its current version and the newest version as outlined within the catalog.txt file.

4.2d Directing N-series Devices To The Firmware Archive Using Device Profiles

If a deployment includes vSpace Management Center, administrators can configure all of their N-series devices for automatic updates at the same time through the use of **Device Profiles**. Keep in mind that as with the device GUI method, the FTP folder and firmware archive must be set up prior to initiating the update. The process for initiating the update from vSpace Management Center is outlined in the steps below.

IMPORTANT NOTE: N-series devices must already be running firmware version **1.2.0.1 or newer** to receive a firmware update from vSpace Management Center. If the intended devices are running firmware older than 1.2.0.1, the device GUI method above must be used instead.

1. From the **Manage Profiles** menu, select the N-series profile you wish to edit. If an N-series profile does not already exist, use the steps outlined in Section 4.5 of this manual to create a new profile for the devices you wish to update.

2. Navigate to the Firmware Update Tab (pictured below).

3. Check the box next to "**Edit settings**" setting at the top of the menu, then select "**Update from a specified firmware file on a FTP server**".

4. Using the **FTP, User, and Password fields** (making sure to re-enter your password in the Confirm field), enter the FTP location of the newest firmware build within the archive you have created. (this will be a file ending in .tar.gz)

5. Take a moment to verify that all other profile settings are as you desire (including screen resolution, XenDesktop settings, etc), and apply the profile from the **Summary Tab**.

6. If you have not done so already, upload the latest firmware build to your vSpace Management Center server, using the **Manage Firmware** menu under the **Administration Tab**.

7. Once the above steps have been completed, head to the **Manage Devices** menu under the **Device Management Tab** and initiate a firmware update on the devices of your choice, selecting the most recent firmware version available.

At this point the selected devices will begin pulling updated firmware in the order specified within the catalog.txt with automatic reboots between each firmware version until the process is complete.

4.2e Example of FTP Folder Setup Using FileZilla

In the case of FileZilla, hosting an existing folder on your host system is a simple process. Once installed, open the FileZilla server interface and complete the following steps:

1. Click on the **Users** icon at the top left of the FileZilla Server window.

2. Click the **Add** button under the Users section to the right of the window and create a new user. (This will be the user account you add to your NComputing device later in this guide)

3. **Add a new folder** under the Shared Folders section and select the folder containing your firmware files. This can be the folder mentioned in the previous section, or any other folder if you've decided to host the files elsewhere. (Note the folder's path as it will be important later in this guide)
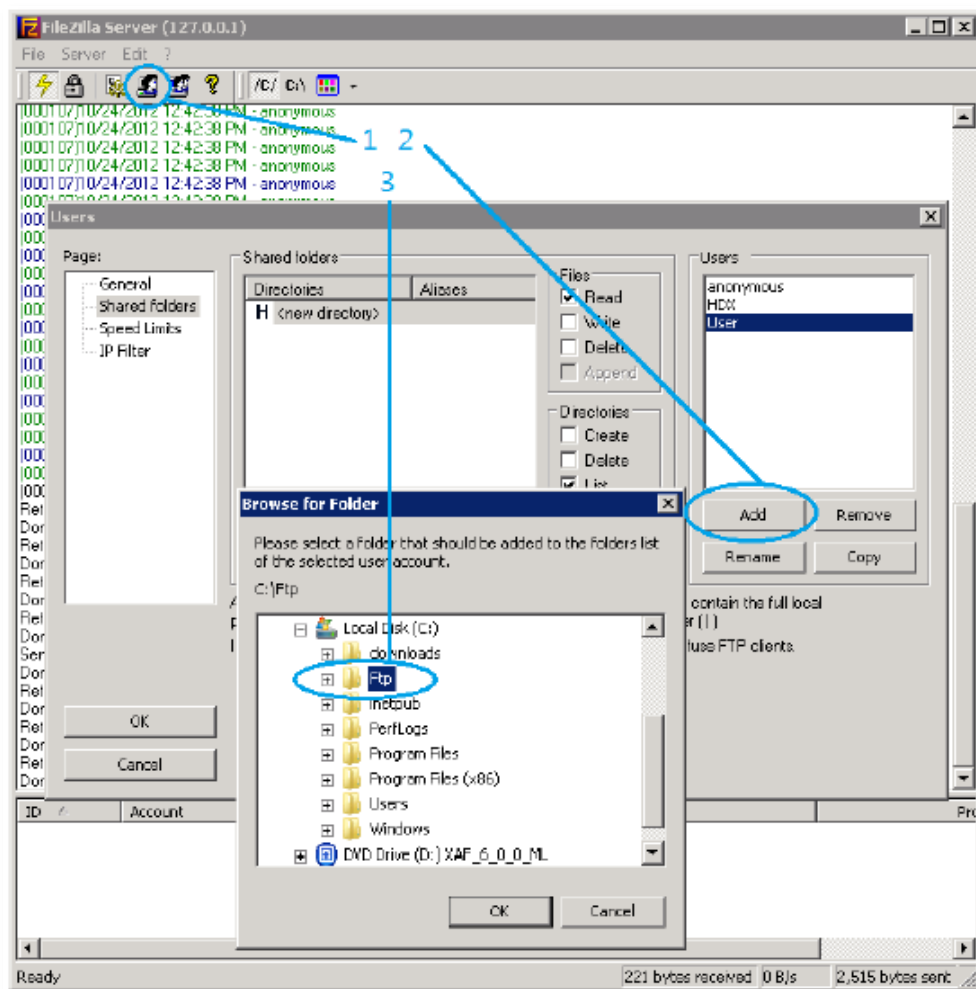
Your firmware files are now shared and available for download via FTP by your devices.

4.3 DHCP Options for Automatic N-series Configuration

This section of the manual will assist administrators in configuring their Microsoft Windows DHCP server(s) to allow the NComputing N-Series to automatically connect to XenDesktop and vSpace Management Center environments. For the purpose of this user manual, we'll be illustrating this process using Server 2003 and Server 2008 R2. It should be noted however that any DHCP server can be used.

If you are already familiar with the administration of DHCP servers and the creation of option tags, feel free to skip to the N-series DHCP Tags section of this guide for a list of tags that the N-series supports.

For those less familiar with DHCP administration, the following pages describe how to access the DHCP settings in Server 2003 and Server 2008 respectively.

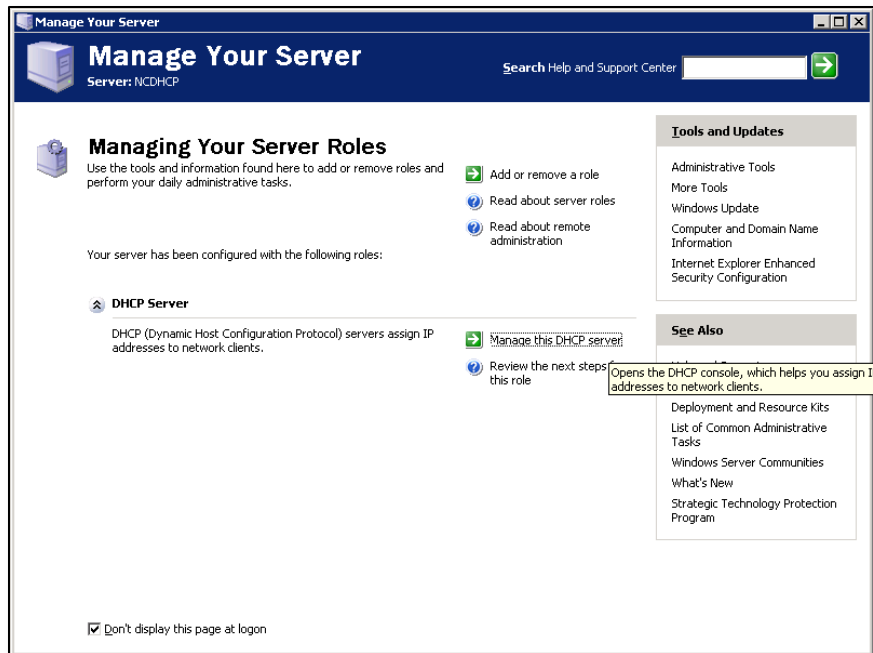## Accessing DHCP Settings in Windows Server 2003

From the DHCP server:
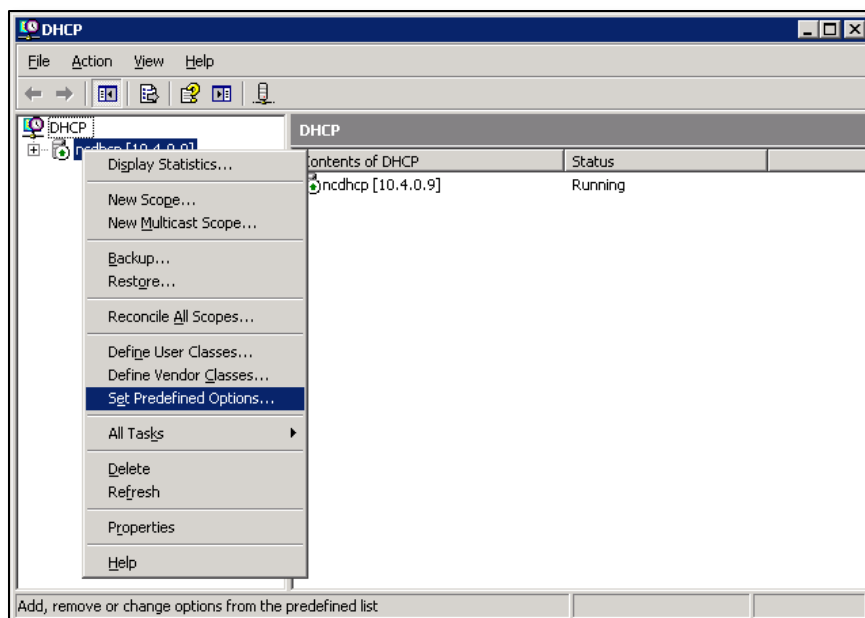
1. From the Start Menu click "Manage Your Server"
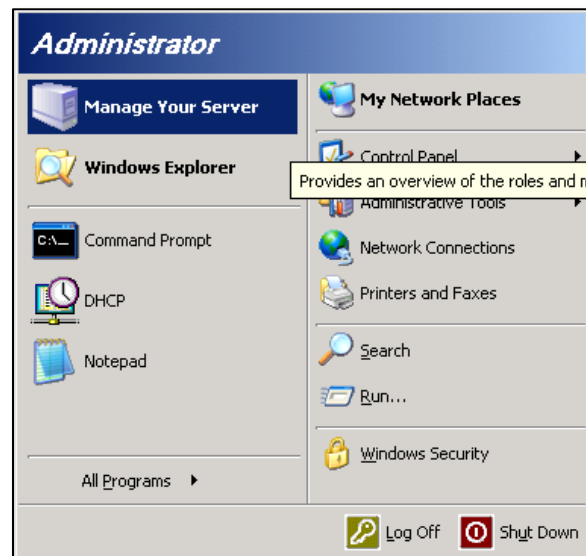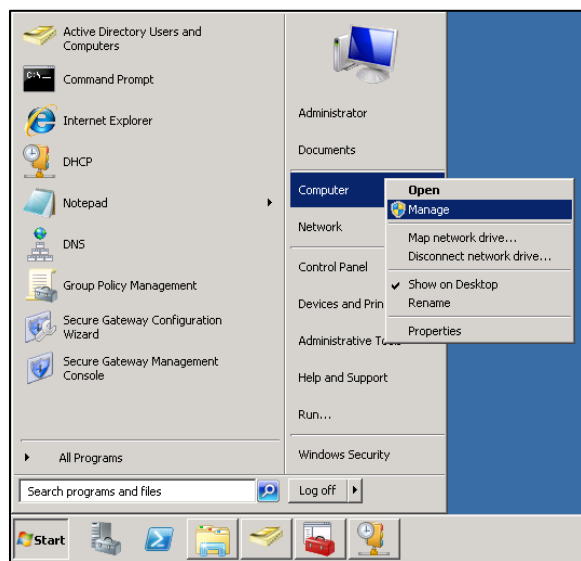
2. Click "Manage this DHCP server" as seen below:

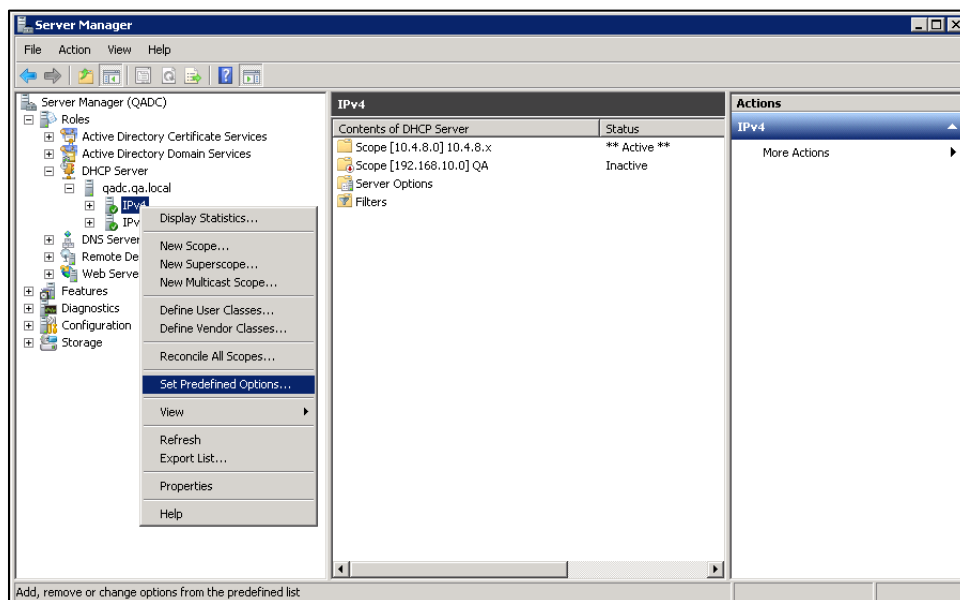3. Select DHCP and click "Set Predefined Options" as seen below.

4. Proceed to the N-series DHCP Tags section of this guide for a description of available DHCP tags and instructions for adding them to your DHCP server.

Accessing DHCP Settings in Windows Server 2008

From the DHCP Server:

1. Right-click Computer and select "Manage"
2. From the Computer Management window, open the Roles section and then the DHCP Server section as seen below.


3. Open the DHCP Server Name in question, right-click on IPv4, and select "Set Predefined Options". You are now ready to specify which DHCP tags you wish to add to your N-series environment. Each of the potential tags and their functions are explained in the next section of this guide.

N-series DHCP Tags

The N-series can make use of several DHCP tags and functions. This section will walk you through adding the tags and functions appropriate for your deployment.

NOTE: This functionality requires N-series firmware version 1.4.1 or newer to be installed on all devices that will be making use of automatic DHCP configuration.

1.   From the Predefined Options and Values window, click the "Add" button.
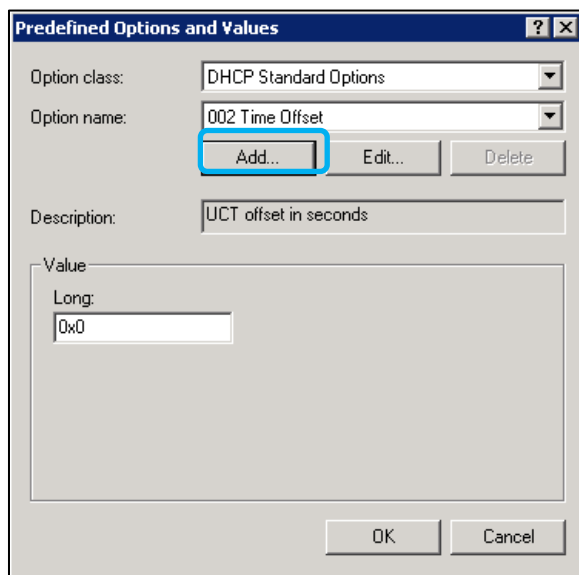
2.   Select and implement your chosen tags by filling out the Name, Data type, Code, and Description fields as specified below. **Note** that the "STRING VALUE" is used later in **step 5**.

XenDesktop Tag 181		
This tag will automatically link your N-series device(s) with their designated XenDesktop server(s).	**Name**	XenDesktop*
	Data Type	String
	Code	181
	Description	Default XenDesktop server
	STRING VALUE	(The IP, URL, or Fully Qualified Domain Name of your XenDesktop server.)
	Notes	*We recommend you use "XenDesktop" plus the IP address or URL of your XenDesktop server to differentiate this tag from any future tags you might add.
NComputing CMF Tag 171		
This tag will automatically link your N-series	**Name**	VMC*

	Data Type	String
device(s) with their designated vSpace Management Center server.	Code	171
	Description	Default vSpace Management Center Server
	STRING VALUE	(The IP or Fully Qualified Domain Name of your vSpace Management Center server)
	Notes	*We recommend you use "VMC" plus the IP address or URL of your vSpace Management Center server to differentiate this tag from any future tags you might add.

N-series Firmware Tag 172

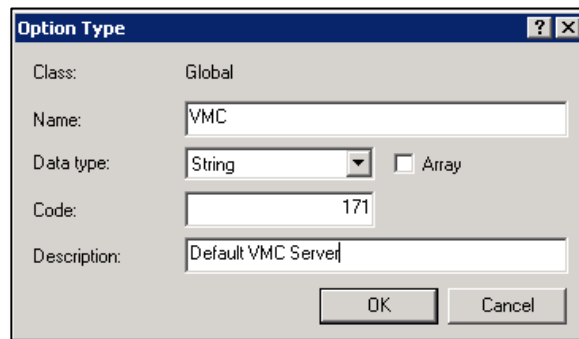|	Name	N-series Firmware URL
This tag allows you to direct your N-series devices to a server that you have created to store and distribute N-series firmware.	Data Type	String
	Code	172
	Description	Address of firmware update server.
Use this tag to store the firmware server's network address.	STRING VALUE	(The FTP, HTTP, or HTTPS address of your firmware server.)
If your firmware server requires a username and password, use tags 173 and 174 to store those details.	Notes	If the server you are storing N-series firmware on requires a username and password, add NComputing CMF Tags 173 and 174 to store that information.

N-series Firmware Tag 173

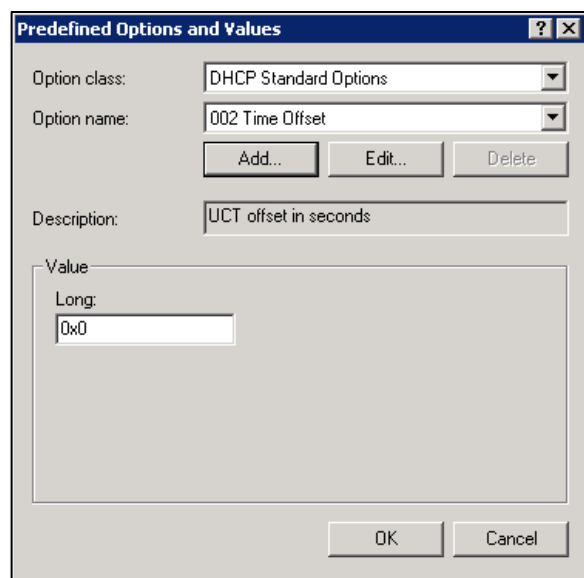|	Name	N-series Firmware Username
Use this tag in conjunction with 172 to store the firmware server's username (if username and password are required).	Data Type	String
	Code	173
	Description	Address of firmware update server.
	STRING VALUE	(The user name required by your FTP server.)
	Notes	This tag is only required if the server you are storing N-series firmware on requires a username.

N-series Firmware Tag 174

	Name	N-series Firmware Password
Use this tag in conjunction with 172 to store the firmware server's password (if username and	Data Type	String

password are required).	Code	174
	Description	Address of firmware update server.
	STRING VALUE	(The password required by your FTP server.)
	Notes	This tag is only required if the server you are storing N-series firmware on requires a password.

To the right is an example of a completed entry (in this case, the VMC 171 tag).

3. You can now verify that the tag you created has been saved by clicking on the **Option Name** drop down (see image below) and searching for the tag(s) in question.

4. Once again from the Predefined Options and Values window, select each tag and fill in the **Value** field with the string values specified earlier in **step 2**.

   a. **Example:** For Tag 171, the string value would be the IP address or Fully Qualified Domain Name of your vSpace Management Center server.

   b. **Note:** For tags that accept IP addresses, you can enter multiple IP addresses so long as each IP is separated by a semi-colon (;).

5. Once your entries are complete, click "OK". Your DHCP Tags are now configured. You may now exit Server Management.

4.4 NComputing Technical Support

For additional technical documentation, solutions, and how-to's, visit
http://www.ncomputing.com/kb/

To request Technical Support for NComputing products, please visit the NComputing Support page at http://www.ncomputing.com/support

4.5 Additional Information on Citrix products and support

For additional information and support for Citrix products and environments, visit http://www.citrix.com/lang/English/home.asp

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