NComputing IP Utility (NIU) User Guide

Contents

Version 1.1
Prepared by: NComputing

TID–101-134g

August 2009

NComputing IP Utility (NIU) Executive Summary

NComputing IP Utility (NIU) works in conjunction with NComputing vSpace Virtual Desktop software to create and manage a number of Virtual Network Interfaces (Virtual NICs) which can isolate the network traffic of each vSpace virtual desktop to its own unique IP address. Once installed and running alongside vSpace, NIU associates one virtual network adapter to each active vSpace session that's connected to a remote virtual desktop device. The NIU software package can be installed and used with Windows vSpace for either L-series or X-series access devices.

Although all vSpace virtual desktop sessions still use the host system's physical network adapter, NIU assigns a virtual network adapter to each vSpace session, and each virtual NIC then obtains its own unique IP address. From the network's point of view, each virtual desktop session and the applications running within it become isolated from the host's IP address and that session is also isolated from all other vSpace sessions running on the same host. The NIU virtual NICs support all standard networking capabilities including the ability for each individual session to communicate via IP protocol with applications that are running inside any other session on the host.

Please note that using the NIU function requires additional IP addresses to be obtained from the LAN DHCP (Dynamic Host Configuration Protocol) pool.

1. An X-series host without NIU only needs one IP address which is shared for all virtual desktop sessions. With NIU installed, an X-series host needs an IP address for each user that may login to the host. For instance, a host with one X300 card installed and using NIU will obtain a total of 4 addresses from the DHCP server.
2. In an L-series environment, each L-device always requires one IP address of its own to communicate with the host. Without NIU installed, each L-series host only needs one IP address for all its network communications. With NIU, the vSpace host machine will obtain and use an extra IP address for each L-device to which it needs to connect. For example, an L-series host using NIU to support 30 virtual desktop sessions will need to obtain 31IP addresses from the DHCP server, and each of the 30 L-series devices will obtain its own IP address for a total of 61 IP addresses consumed on that network

Note: NIU is currently available only for Windows® environments.

Applications

Without NIU's per-session IP virtualization, all packets sent from a vSpace host computer get tagged with the same originating IP address (that of the host) regardless of which session or user is running the application sending out the IP packets.

NIU addresses this problem of one IP address by creating and assigning Virtual Network adapters (and unique IP addresses) on a per-session basis. An IP address is requested from the DHCP server for each virtual network adapter and those IP addresses are associated with Virtual MAC addresses that are uniquely generated by NIU. These virtual MAC addresses are based off the host network adapter's physical MAC address following standard network virtual MAC rules which assure the created virtual MAC addresses are all unique for the entire network.

Therefore for LANs or WANs, once NIU has assigns the unique IP addresses, each session and its associated user terminal is now viewed by the outside world with a unique IP address.

Some third party applications need to uniquely identify the source of IP packets sent by a host computer onto the network. And some terminal services aware applications such as IP based messaging or print control and auditing software need the ability to uniquely identify each of its running instances to correctly exchange messages between sessions and hosts. NIU will allow some of these applications to fetch the individual virtual IP's in an NComputing virtual desktop environment (if the application has the ability to read the virtual NIC and its IP address).

NIU Installation

Prerequisites:

- Genuine NComputing hardware devices
- The current release of NComputing vSpace Terminal Services software
- LAN connection (and OS driver) must be installed in the host and active.
- Each NIU created Virtual NIC initially uses DHCP to get its IP address; so, make sure you actually have a DHCP server available for this system before you install NIU.
- Ensure the DHCP server has enough available unassigned IP addresses for the vNICs you plan to create. Otherwise, vNIC creation may take up to a minute each because the DHCP requests must each “time out” before Windows finally realizes there is no new IP to assign.

Installation

- Please close all running programs and stop any active NComputing virtual desktop sessions.
- Prior to launching the NIU installer, Login to the host with appropriate Administrator rights
- Verify that the host already has vSpace installed
- Copy the installation file to a known location on the host system
- Double-click the **“NIUInst.exe”** icon to start the install

Note: This document’s install screen illustrations are from NIU version 1.9.1, but this user guide also applies to NIU version 1.9.2

1. End-User License Agreement (EULA)

Please read the EULA carefully, please select “I agree” and click “Next” to continue.

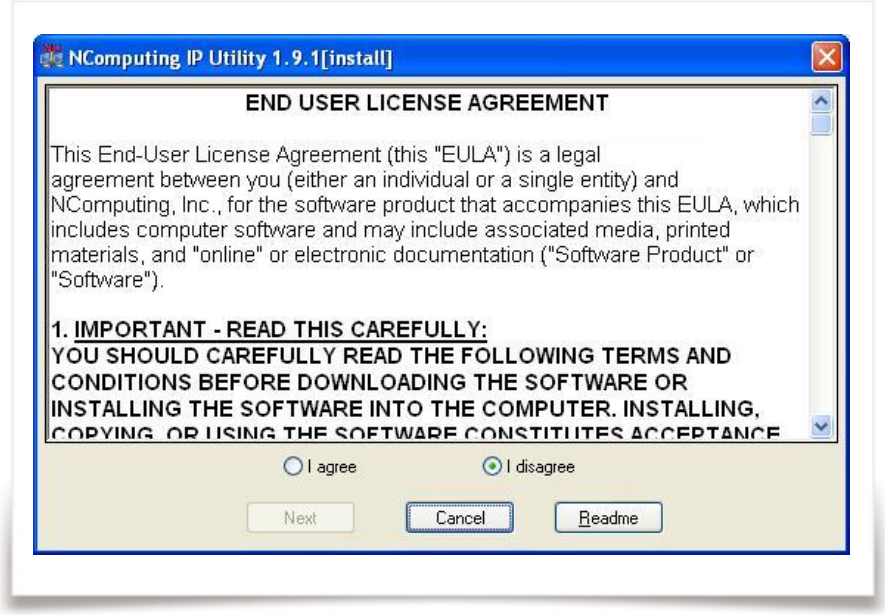


Figure 1

If you press the “Readme” button you can view the contents of the “Readme.txt” file. This file contains information about the current release.

Click the “OK” button (Figure 2) to return to the EULA window.

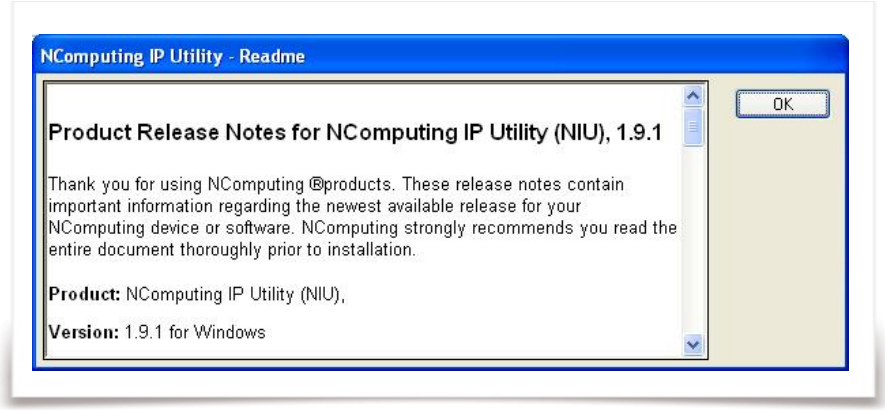


Figure 2

2. NComputing IP Utility
Available Network Card selection

In Figure 3, the detected network card(s) are displayed; please select the appropriate network card to which NComputing IP Utility will be bound. Click "Next" to continue.

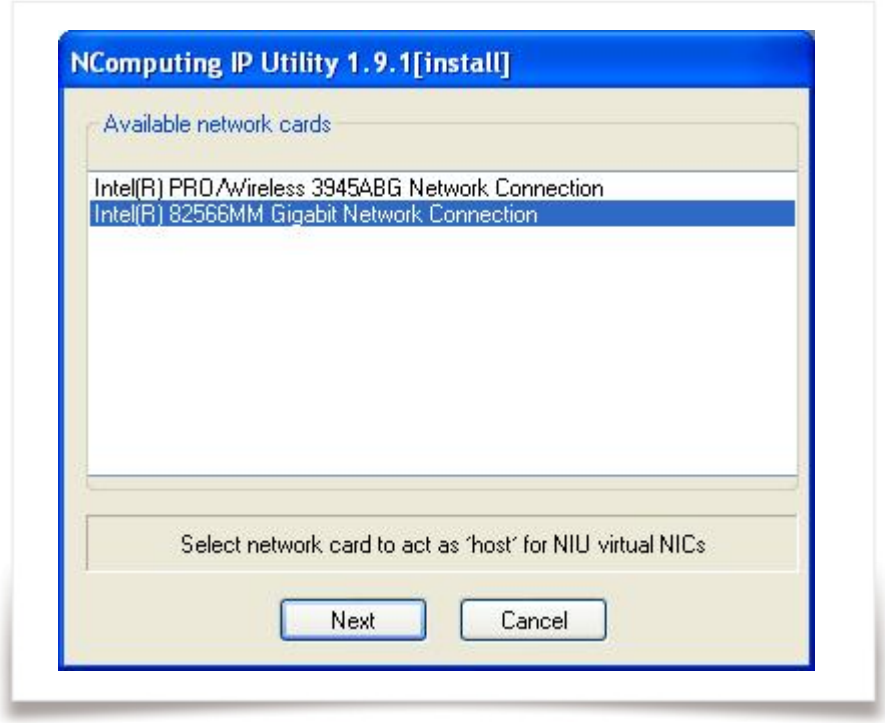


Figure 3

3. NComputing IP Utility
Create Virtual NICs

In this step, you select how many Virtual Network Adapters you wish to install.

1. For X-series implementations, the number of virtual NICs to create is deterministic. For example, in a 2-card X300 installation, the maximum needed is 6 Virtual Interfaces, and for a 2-card X550 host system, up to 10 virtual NICs should be added.
2. When setting up an L-series environment that has frequent log on and log off activity, such as in a school environment, the number of virtual IP allotted should exceed the number of users by about 5 IP addresses. This will allow for inactive sessions (disconnected for the L-device but not yet terminated) to properly exit and the new user's replacement session to grab an available virtual NIC.

Please use the pull-down option to select the number of interfaces desired. For this example (Figure 4), we'll add 2 Virtual NICs.

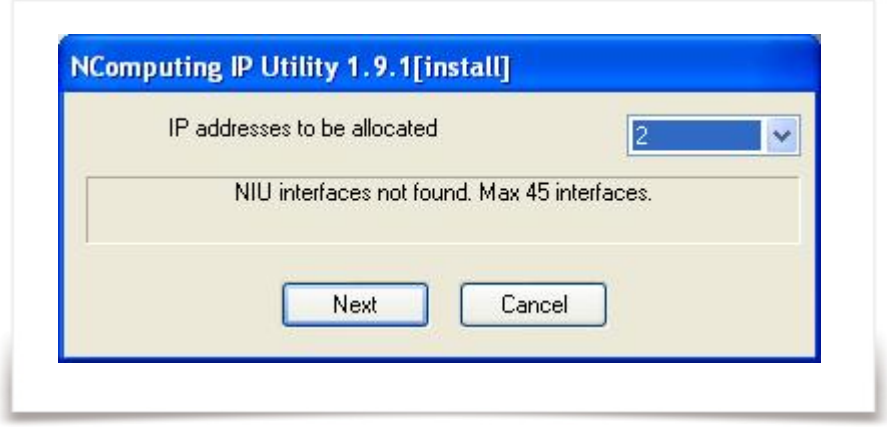


Figure 4

Click **"Next"** to start installing the virtual NICs.

Note: In X-series deployments, only one virtual NIC is required per physical station but ports are assigned in the physical port order of the PCI card (1, 2, 3, etc.). Port 1 is at the top of the card, port 2 next, then port 3 (and up to 5 ports on an X550). Therefore if you are using Port 3 on the card then three virtual NICS and three IP addresses must be generated to cover that port, even if only one physical station will be connected. If you want to create and use only one virtual NIC, then plug the one physical station into port 1 instead of port 3.

NIU will always allocate and initialize the number of IP addresses specified; so, your DHCP server must have enough IP addresses available in its address pool to service all hosts on the network. The next screen (Figure 5) provides a reminder and gives an opportunity to stop before the virtual NICs are created and IP addresses consumed from the DHCP pool.

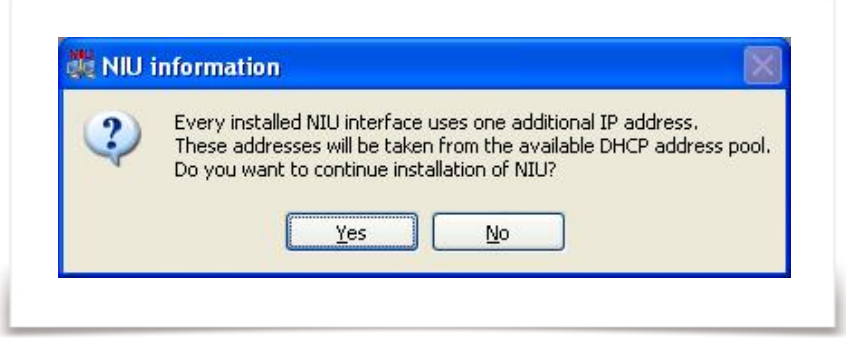


Figure 5

Click **"Yes"** to continue.

PLEASE NOTE: The NIC configuration process within Windows is individual and sequential; therefore, each new NIU IP address created also increases the host system's boot time.

4. Installation, progress and completion of the Virtual Network Interfaces / NIU Virtual network cards.

At this point, NIU performs the following actions:

- Generates Virtual MAC addresses.
- Installs the Virtual Network adapters.
- Requests the required number of IP addresses from the DHP server

Virtual NICs generated by NIU initially get addresses assigned from the DHCP server attached to the network card selected on the previous install menu (Figure 3). To make static IP assignments, please go to the Windows Control Panel > Network Connections and make appropriate changes to the Virtual NIC settings (Figure 13).

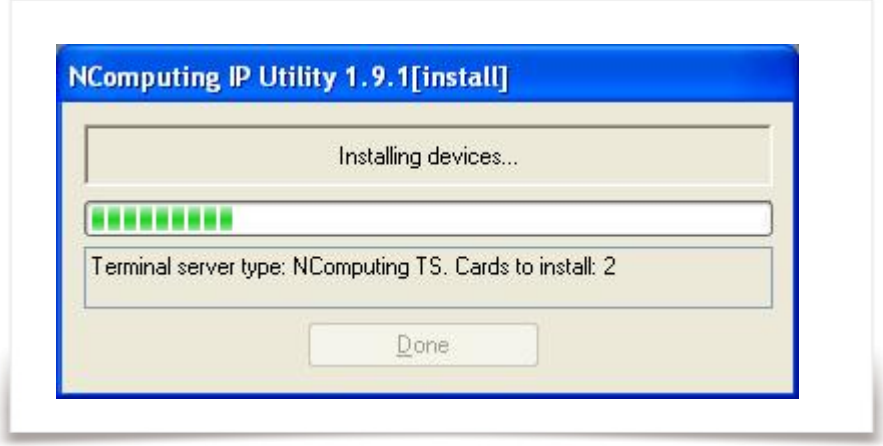


Figure 6

Registration:

NIU has a built-in 30-day TRIAL license to allow testing compatibility in your network environment. If you don't have a key, choose "No" when asked to activate (Figure 7), and continue with a 30 day evaluation: An NIU license key can be added at a later time to extend the license.

Figure 7

If you have been provided an NIU license key, click “Yes” on the above activation question, and enter the key in the following window (Figure 8).

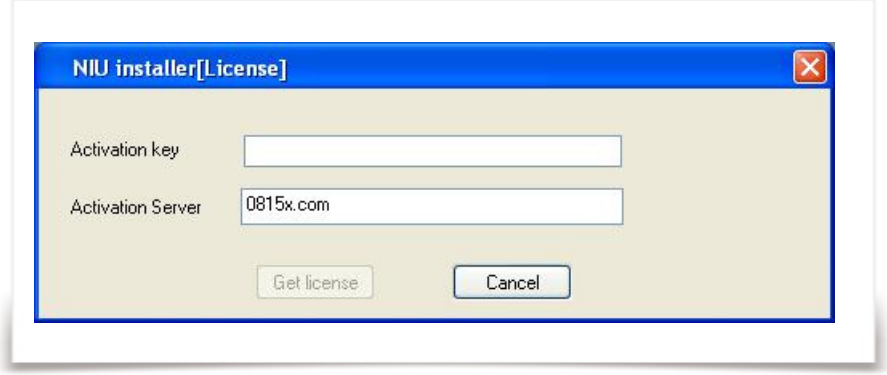


Figure 8

After the “Get License” button is clicked, NIU contacts the NComputing license activation server (Figure 9) and checks the activation key entered.

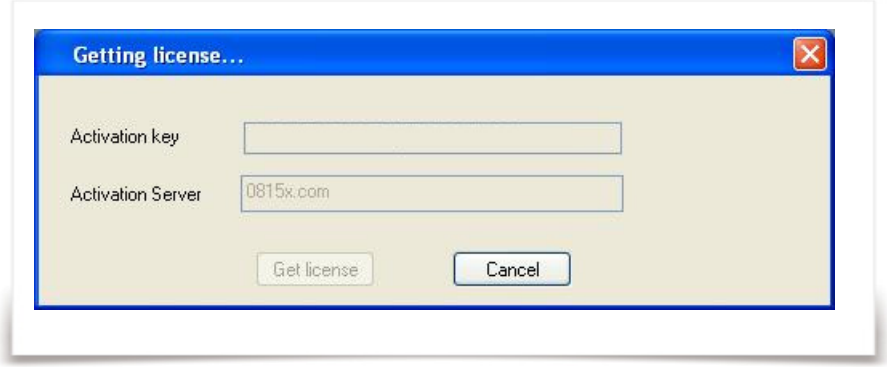


Figure 9

If the activation key has not already been used, NIU obtains the necessary license (Figure 10), NIU is activated and locked to the system on which it’s installed.

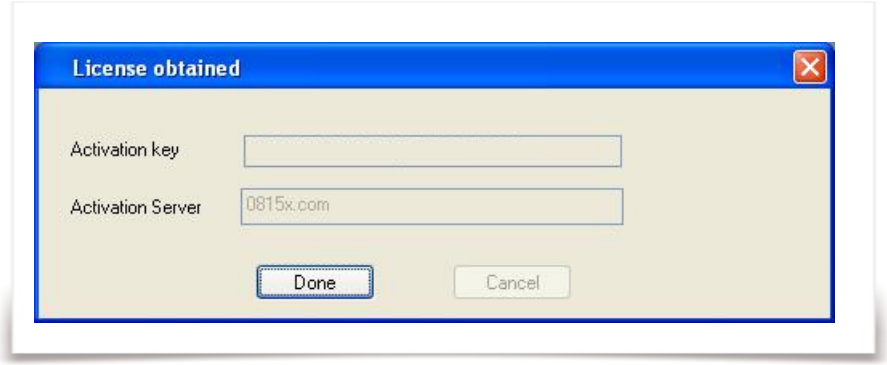


Figure 10

NIU installation is now complete, please close any running applications, and click **"Restart"** to restart your PC (Figure 11) and start using NComputing IP Utility.

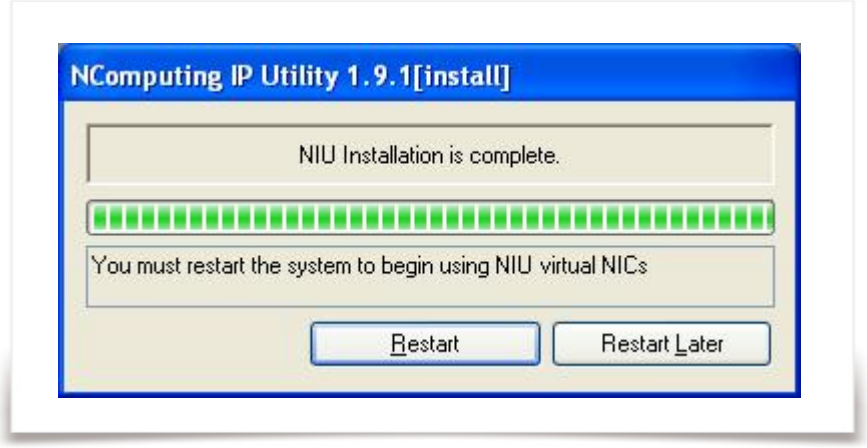


Figure 11

Using and verifying NIU operation

By default, NIU places an icon in the System Tray that can be used to launch the NIU Console.

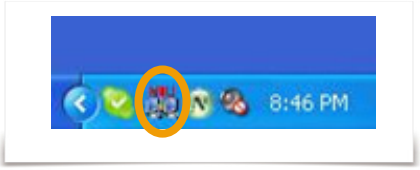


Figure 12

All the new virtual network interfaces will be displayed under "Network Connections" (See Figure 13 below), and this is where you can set any or all the virtual NICs to use static IP addresses.

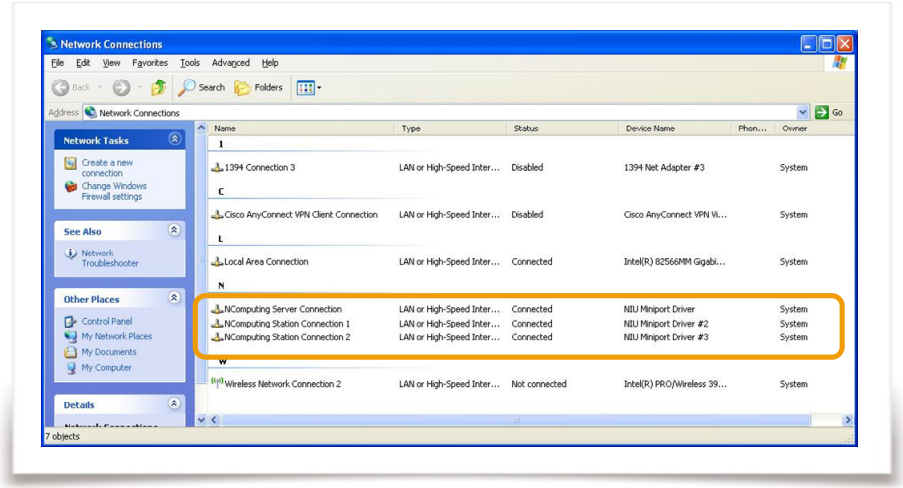


Figure 13

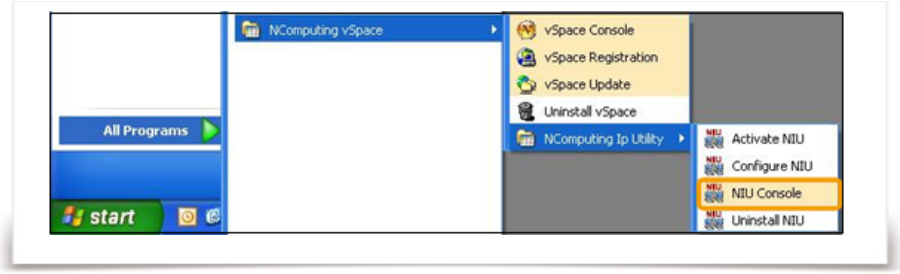


Figure 14

The NIU Console can also be invoked from the Start Menu (Figure 12) by navigating:

Start → All Programs → NComputing vSpace → NComputing IP Utility → NIU Console

The NIU console window explained

From the System Tray (Figure 12), double click the "NIU" icon to open the NIU console (Figure 15).

The "NIU IP address" column displays the IP addresses which were assigned by the DHCP server (or manually in using the Network Connections screen) to each Virtual MAC address generated by NIU. Virtual network interface (VNIC) "0" (Zero) is an abstraction of the Host's main network adapter and is always assigned to the host's main session.

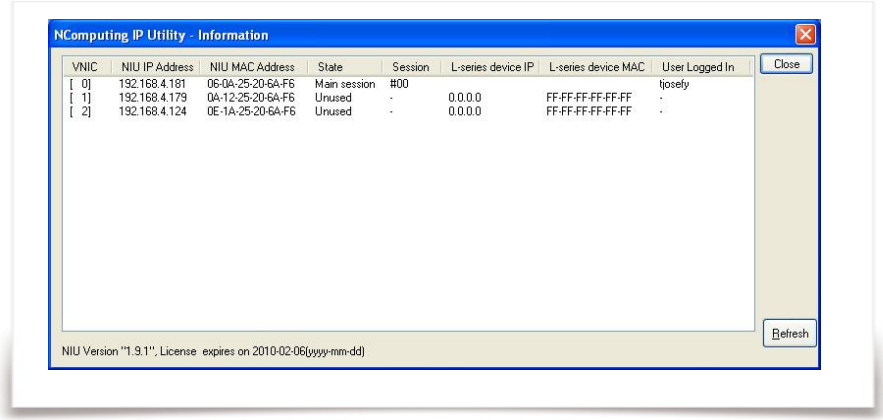


Figure 15

Each L-Series device that connects to the host is assigned to a Virtual NIC and the logged-in user's session is associated with an IP address. After each session login, usernames can be displayed in the NIU Console. Please click the "Refresh" button in the lower right-hand corner of the console to refresh the screen and see the current session to IP address "mapping." See figure 16 below.

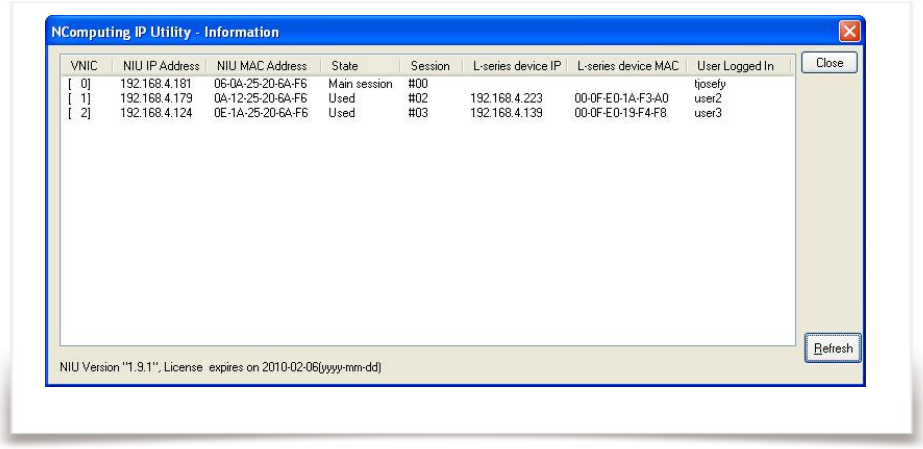


Figure 16

Note: The mapping from Virtual NIC connections on the host to L-devices are displayed in the NIU Console. The Virtual NIC IP addresses assigned to the user sessions are used for:

- communications between session applications running on the same host,
- between session applications (e.g. Printing Control software) and other computers on the LAN or the Internet.

IMPORTANT! The vSpace console only displays the local IP address used by the L-Series device itself (Figure 17).

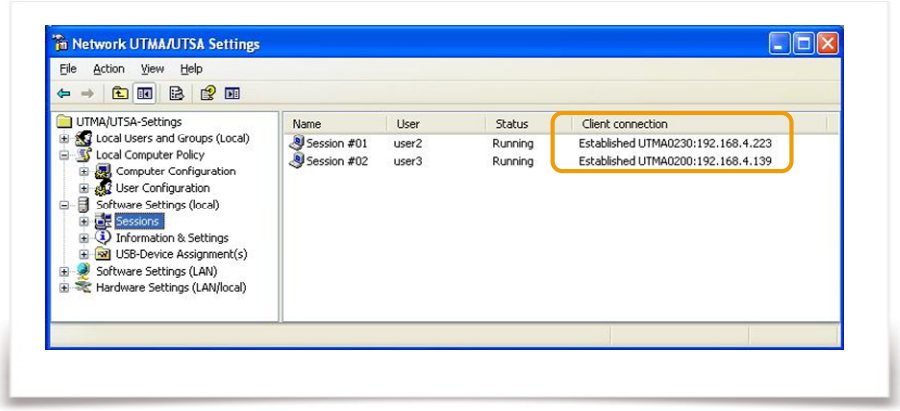


Figure 17

Uninstall NIU

Important! Before uninstalling NIU; please use the vSpace Console to STOP all running Stations,

Right click the station you want to stop (Figure 16), and select **"Stop Station"**

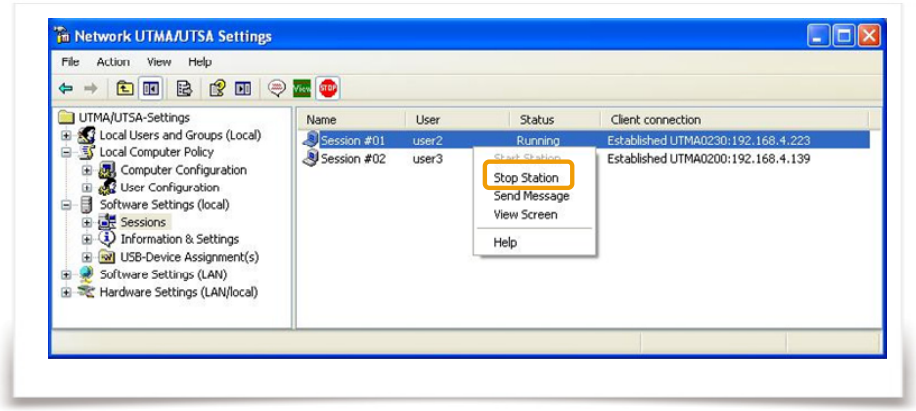


Figure 18

The following screenshot (Figure 19) shows the vSpace console warning message to verify that you want to stop an active session.

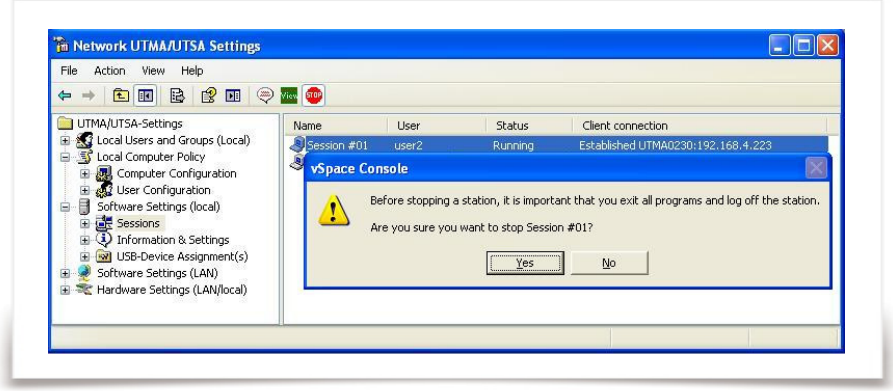


Figure 19

This following screenshot shows a station in the process of stopping.

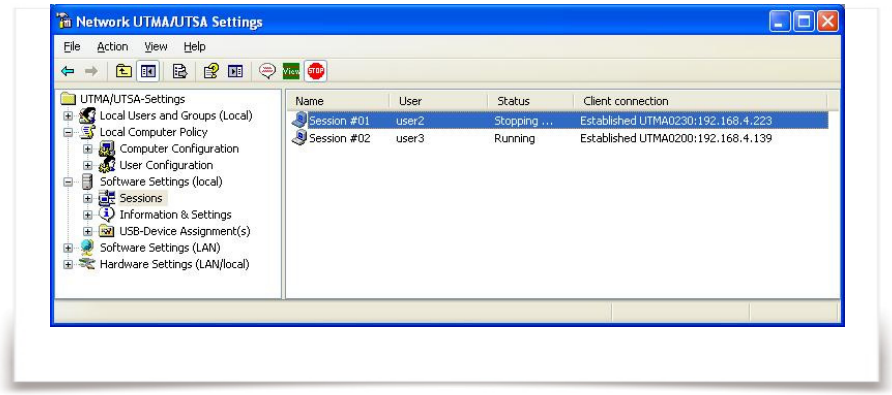


Figure 20

NIU uninstall

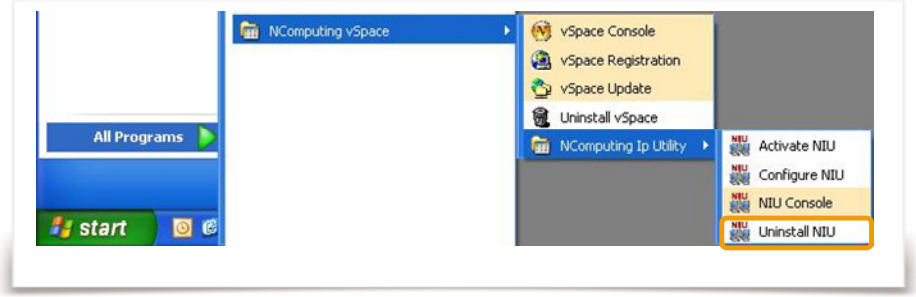


Figure 21

To uninstall NIU, select the Uninstall NIU command from the start menu under:

NComputing vSpace → NComputing IP Utility → Uninstall NIU (Figure 19)

Select “Yes” (Figure 22) to verify you wish to remove NIU.

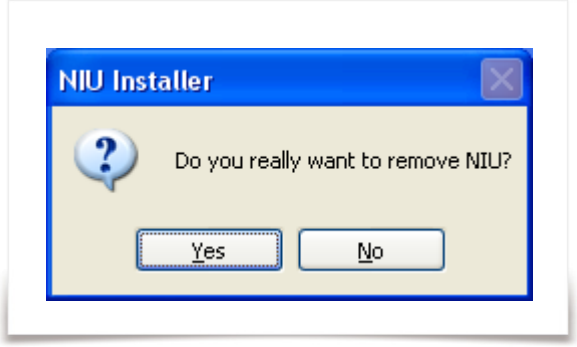


Figure 22

If there are still any active remote sessions, the NIU uninstaller provides a warning message (Figure 23). .

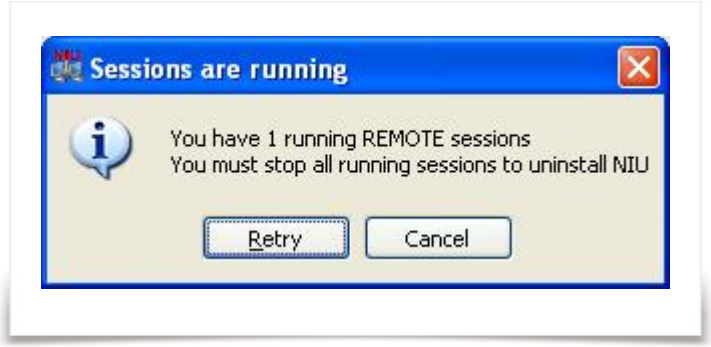


Figure 23

NIU Uninstall progress window (Figure 24) shows the Virtual NICs are being removed.

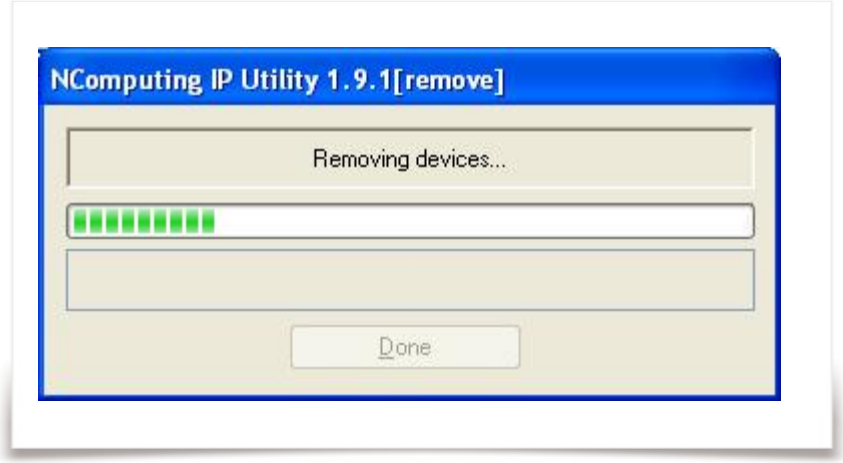


Figure 24

NIU uninstall is complete (Figure 25). Please restart Windows® to finish the uninstall process and enable NIU to function.

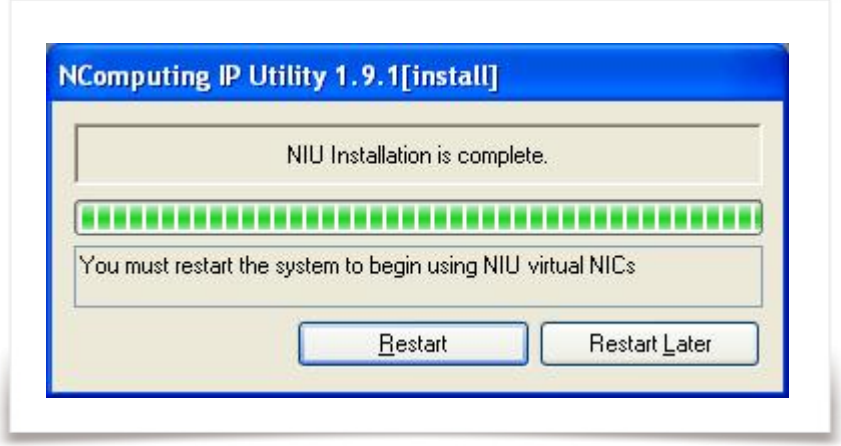


Figure 25

Configuring select third party applications for use with NIU

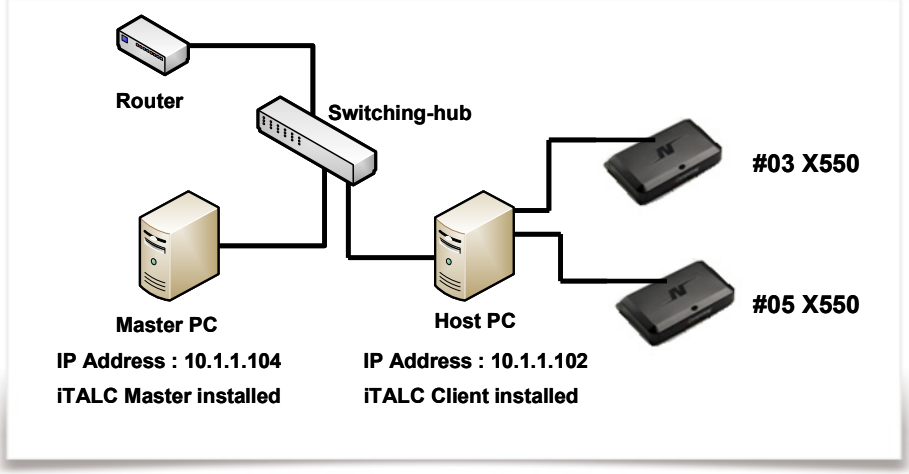
iTALC Classroom Management Software with NComputing X-series kits

iTALC management software doesn't need NIU, and the normal configuration for iTALC is documented in an NComputing Install Tips document called "Configuring iTALC Management Software for use with NComputing Systems."

However, if NIU is used on the NComputing host system to meet some other software product's requirements, then the iTALC configuration procedure needs to be modified so NIU and iTALC both function at the same time.

Each individual iTALC client that runs in a virtual desktop session doesn't need to know its own IP address, and it just responds to any request it "sees" on its specified TCP/IP port. So we need to combine information from the NComputing vSpace Console with that from the NIU console to correctly configure classroom "IP-address:TCP-port" definitions for each virtual desktop session.

The following diagram and screen shots illustrate the configuration process for an example with the “iTALC classroom master” running on one PC, and vSpace with NIU running on a second PC to isolate each virtual desktop session’s network traffic into a separate IP address.

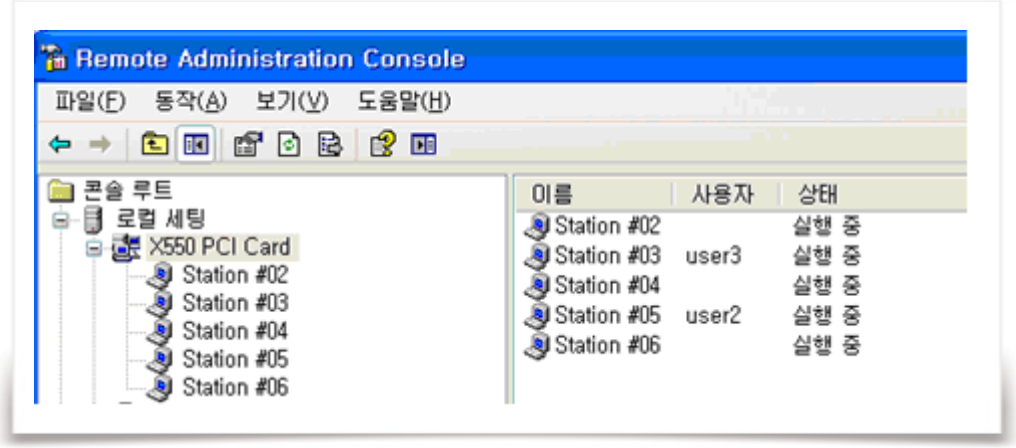


We make use of the fact that we know how the TCP/IP ports are assigned to the iTALC clients when they are started by the “italc_config_X.bat" file, and in this example, we see that “station 3” will always listen on TCP/IP port 5902, and “station 5” will always listen on port 5904.

```
EXIT
:STATION2
"C:¥Program Files¥iTALC¥ica.lnk"  -ivsport 5901  -isdport 5801 &
EXIT
:STATION3
"C:¥Program Files¥iTALC¥ica.lnk"  -ivsport 5902  -isdport 5802 &
EXIT
:STATION4
"C:¥Program Files¥iTALC¥ica.lnk"  -ivsport 5903  -isdport 5803 &
EXIT
:STATION5
"C:¥Program Files¥iTALC¥ica.lnk"  -ivsport 5904  -isdport 5804 &
EXIT
```

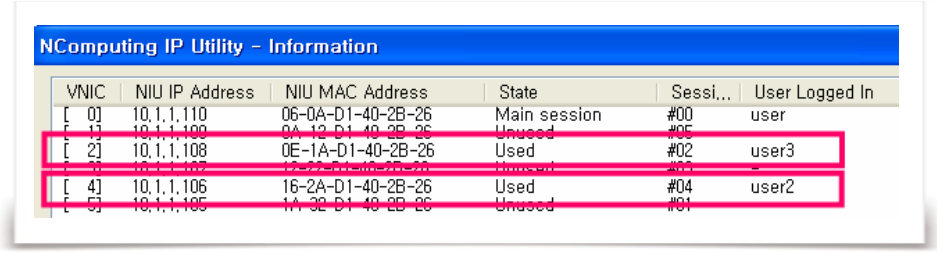
Relevant section from italc_config_X.bat file

Using the vSpace Console, we can see (screen shot below) that “station 3” has “user3” logged-in and “station 5” has user2 logged-in. (For X-series configurations where the NIU vNICs have static IP addresses assigned, you only need to determine the physical station number to IP-address mapping once, and that mapping will stay the same between host reboots.)



vSpace Console showing which stations have user3 and user2 logged-in

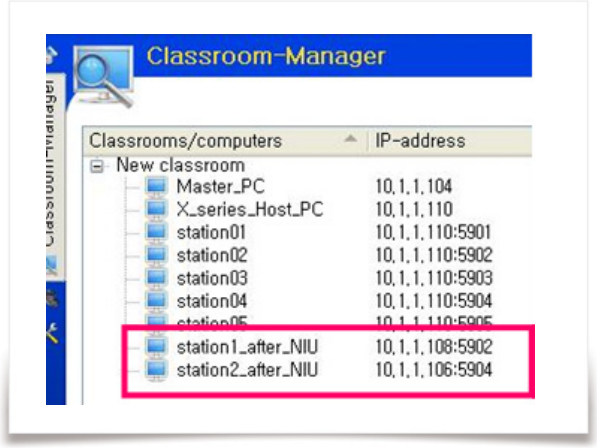
Now, we use the NIU Console to determine that user3’s virtual desktop session has IP-address 10.1.1.108, and user2 is logged-in to the virtual desktop session that has IP-address 10.1.1.106



NIU Console showing IP Address mapping to Sessions and Users

vSpace console Info	NIU Console Info	“italc_config_X.bat" file knowledge
User3 on Station 4	IP-address 10.1.1.108	TCP/IP port 5902
User2 on Station 5	IP-address 10.1.1.106	TCP/IP port 5904.

Combining these three sets of information tells us how to properly define this "classroom PCs" on the iTALC Master PC (as in screen shot below).



iTALC Classroom defined with session IP-address and iTALC client TCP/IP port

Known limitations or errata on your release

Please see the current NIU readme document.

ncomputing.com

TID 101-134g – August 2009

USERGUIDE NIU REV2