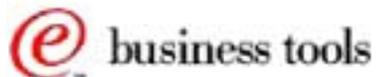# IBM NetVista
# Thin Client Manager
# Operations Utility

# A Technical Overview

July 2000

e business tools

*IBM NetVista Thin Clients*
*Access for today, flexibility for tomorrow*

# What Is It?

- **A Java-based tool for central administration of thin clients**

- **To perform tasks such as:**
  - Reboot or shutdown one or more workstations
  - Upload a workstation's configuration to a server and push it back down to the same or other workstations
  - Update the contents of the flash card on one or more workstations
  - Remotely power one or more workstations

- **Manages fully NetVista Thin Client Express**

- **Can also manage TCM V2R1 thin clients (at PTF 6 or later) although with a reduced set of functions at this time (July 2000)**

# Notes

The IBM NetVista Thin Client Manager Operations Utility is a Java-based tool that can be used to centrally manage a network of thin clients by performing operations such as remote power on (Wake on LAN), Reboot, or Shut down, trigger an update of the operating system components on the flash card, and backup and restore configuration files from/to the flash card of one or more workstations.

It is a very easy-to-use tool, with a graphical interface that displays a list of workstations, and one or more workstations can be selected to be acted upon.

Essentially, with a few clicks of the mouse, one can select a whole group of workstations and cause an update of the contents of the flash card on all these workstations.

# Operations Utility Main Panel



List of Clients

Tasks Icons

Status Messages

cbechard-06/2000

# Notes

The utility is very easy to install and use as everything is fairly intuitive. The best way to describe this is to look at the main panel. On the left hand side is a list of clients where one or more can be selected to operate on. The list of clients is managed using the buttons on the right to add, remove and modify clients.

To perform an action, one or more clients in the list can be selected, and then a task is then selected either from the Tasks pulldown or using the task icons.

Once the task is triggered to execute, the status is listed in the bottom portion of the panel.

In this example, as illustrated in the messages appearing in the bottom portion of the chart, first a Refresh Workstation Status task was executed on the 9.67.239.55 unit and then a Reboot operation was performed on the same unit, both of which were reported as having completed successfully.

# Operations Utility Tasks

**NetVista**

---

**IBM NetVista Thin Client Manager Operations Utility**

File    Options    Tasks    Help

babyblue.raleigh.ibm.com/9.67.239.53/00.60.94.2a.2c.9b
s2800eth.raleigh.ibm.com/9.67.239.54/00.06.29.67.02.13
s1000eth.raleigh.ibm.com/9.67.239.55/00.06.29.23.02.9d

Flash Update...

Authenticate from Server...

Boot from Server...

Boot from Flash...

Shut Down or Reboot...

Wake On LAN...

Stop or Start Telnet Daemon...

Stop or Start FTP Daemon...

Back Up or Restore Configuration Files...

Change Remote Access Authorization...

Grant or Deny Access to Configuration Tool...

Reset to Factory Defaults...

Add Workstation or Group

Remove Workstation or Group

Display or Edit Workstation or Group

Refresh Workstation Status

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*IBM NetVista Thin Clients*

# Notes

So, what are the operations that can be performed via TCM Operations? The Tasks pulldown contains the following operations:

o **Flash Update** - Cause a client to pull a flash update from a designated server
o **Authenticate from Server** - Changes the NVRAM parameters on the client so that on the next boot, the client will boot from flash but authenticate from a server and also get its configuration files from a server
o **Boot from Server** - Changes the NVRAM parameters on the client to cause the client to boot from a server on the next boot
o **Boot from Flash** - Changes the NVRAM parameters on the client to cause the client to boot from flash on the next boot
o **Shutdown/Reboot** - Causes a powered on client to power down or to Reboot
o **Wake on LAN** - Causes a client currently powered off to power up and come alive
o **Start or Stop Telnet Daemon** - Causes the Telnet daemon to start or stop on the client. Telnet can be used by an administration to do remote problem determination for example
o **Start or Stop FTP Daemon** - Causes the FTP daemon to start or stop on the client. Files can be retrieved or stored from the unit by the administrator when doing problem determination.
o **Back Up or Restore Configuration Files** - Causes TCM Operations to FTP into the client to get or put a set of configuration files. Files can be pulled from one client and pushed to another client to clone units.
o **Change Remote Access Authorization** - Allows changing the administrator password and the SNMP community name passwords. If one chooses to also reboot at the same time, the changes are reflected not only in the client configuration on the station but also in the workstation definition in the TCM Operations Utility.
o **Grant or Deny Access to Configuration Tool** - Effectively locks or unlocks access to the configuration tool on the client.
o **Reset to Factory Defaults** - Resets the client to factory settings. If desired, only certain settings can be selecting for reset instead of all settings.

# Adding Workstations

**NetVista**

```
Thin Client Express
    s1000eth.raleigh.ibm.com/9.67.239.55/00.06.29.23.02.9d
nonExpress
    babyblue.raleigh.ibm.com/9.67.239.53/00.00.00.00.00.00
    s2800eth.raleigh.ibm.com/9.67.239.54/00.06.29.67.02.13
WBTs
```

**Add Workstation or Group**  ✕

- ● Workstation

- ○ Workstation range

- ○ Group

| | |
|---|---|
| Workstation address | 9.67.239.57 |
| MAC address | 00.00.00.00.00.00 |
| Administrator password | nstation |
| Read Community Name | ibmncd |
| Read/Write Community Name | ibmncd |

| OK | Cancel |
|---|---|

Add Workstation or Group

Remove Workstation or Group

Display or Edit Workstation or Group

Refresh Workstation Status

baby
Ping
Refr

9.67
Ping

s100

cbechard-06/2000

# Notes

The first task required is to add workstations (clients) to the list that can be managed by the utility. This is done via the **Add Workstation or Group** Function, as illustrated here.

In the workstation address field of the panel that is presented for entry, one can enter either an IP address or an IP Host Name. If the IP address is entered, the utility will get the IP Host name by doing a DNS lookup.
To get the MAC address of the client, an SNMP request is sent by the Operations Utility to the client.

Notice that you can enter data for an individual workstation but also for a group. Even though the group panel is not shown here, it would have a group name field and a range of IP addresses (Start and End) that can be entered.

In this example, we have created a group called non-Express, which contains two stations. All we entered was the group name and the range (9.67.239.53 to 9.67.239.54) and the utility automatically gathered the rest of the data. In fact, in this case, it was unable to retrieve the MAC address of the .53 unit.

You can also create a group without any stations and just stations to the group later.

Notice at the bottom that you can enter the administrator password and the Read and Read/Write Community Names that are to be used when contacting this workstation. If these names do not match the community names that are configured on the workstation, the operation fails.

**Note**: The default community names as shipped is IBMNCD (as opposed to public).

# Displaying/Editing a Workstation

**NetVista**

IBM NetVista Thin Client Manager Operations Utility

File   Options   Tasks   Help

**Thin Client Express**
- s1000eth.raleigh.ibm.com/9.67.239.55/00.06.29.23.02.9d

**nonExpress**

Model: 2200 / Release: V2R1 / NetVista Thin Client Express: No / Status: On   or Group

- babyblue.raleigh.ibm.com/9.67.239.53/00.00.00.00.00.00
- s2800eth.raleigh.ibm.com/9.67.239.54/00.06.29.67.02.13

**WBTs**

## Display or Edit Workstation or Group

| | |
|---|---|
| Workstation address | s1000eth.raleigh.ibm.co... |
| Model | model2200 |
| Release | v210 |
| MIB Version | 200006010000Z |
| Status | true |
| Configured as TCM Express | true |
| MAC address | 00.06.29.23.02.9d |
| Administrator password | nstation |
| Read Community Name | ibmncd |
| Alternate Read Community Name | public |
| Read/Write Community Name | ibmncd |
| Alternate Read/Write Community Name | public |

Remove Workstation or Group

Display or Edit Workstation or Group

Refresh Workstation Status

babyb
Ping
Refre

cbechard-06/2000

# Notes

Once a station has been added, the Operations Utility automatically attempts to fill in the rest of the data, such as the host name and MAC address.

You can also cause this data to be gathered by using the Refresh Workstation status button.

Notice that the icon representing a workstation changes according to the type or status of the station. See the following page for a list of the icons and their meaning.

Moving the cursor over a particular entry displays data about the station, in particular whether the status is powered ON or OFF, as illustrated here with the rectangle that starts with Model: 2200/ Release: V2R1 ...

Once the station's status has been refreshed, a click on Display or Edit Workstation or Group brings up the panel as illustrated here. Notice that the default Alternate Community names for read and read/write has been added, as well as the model and release of the station (V210 meaning V2R1M0), the MIB version, the status and whether the station is operating as a TCM Express unit or not.

(Note: At the moment, if you add an Express unit to the list, and then boot the unit as a V2R1 unit, the icon will not change unless you delete the entry and add it again while it is operating as a V2R1 unit, but that will be fixed in the next release).

# Workstation Icons Legend

**Cannot contact unit or unable to identify workstation**

**IP Address or IP Host Name does not resolve via DNS**

**Unit responds to a PING but it either does not responds to SNMP or it responds to SNMP with an unrecognizable string**
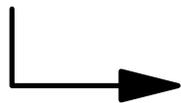
**A group of workstations**

**A Power PC based workstation such as a S/100, S/300 or S/1000**

**A N2200e Thin Client Express workstation**

**A V2R1 workstation (N2200 or N2800)**

**Icon is grayed out when a successful contact was made sometime in the past but the unit is not responding to PING at this time**
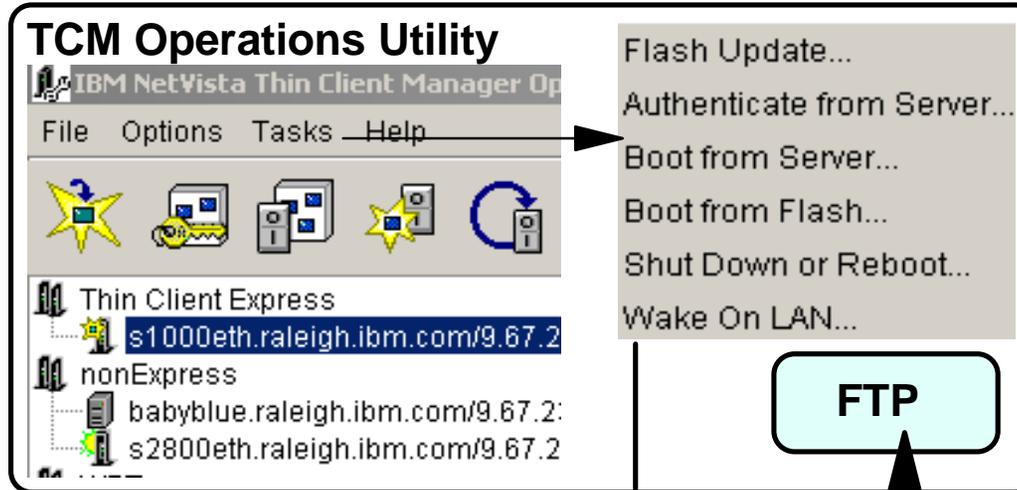
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# Notes

This page lists the icons that are used to represent workstations and the meaning of the different icons.
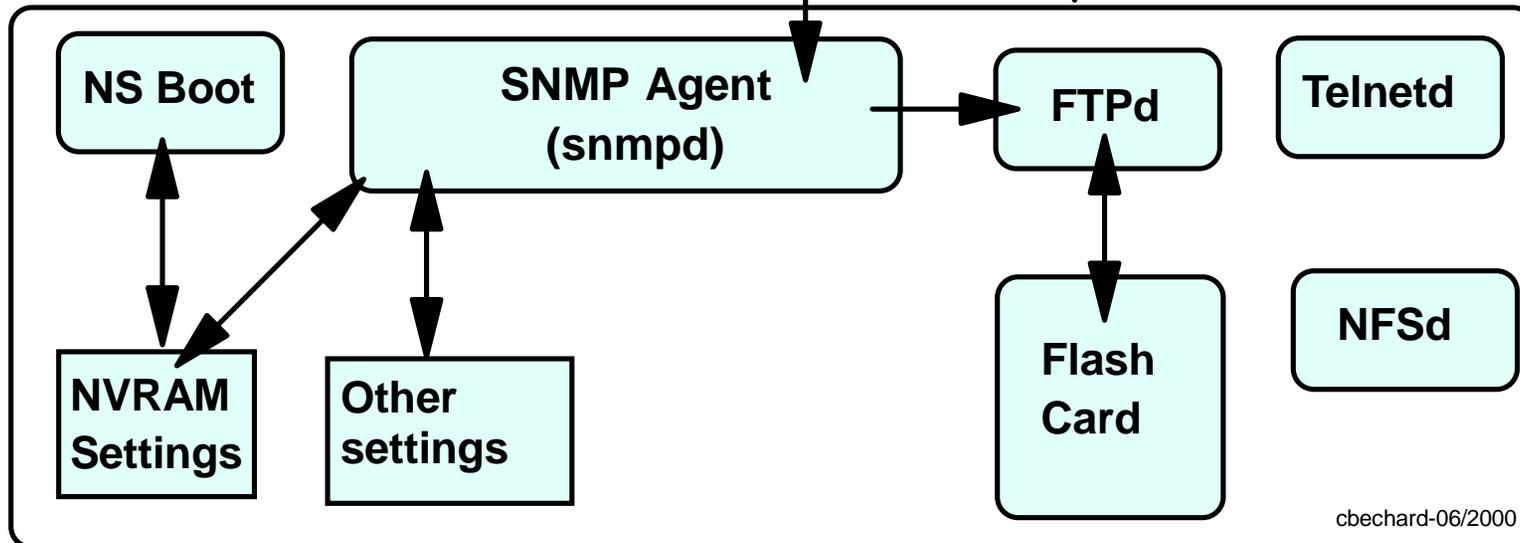
- The question mark icon indicates that either the unit cannot be contacted or, if it can be contacted, we do not know what it is.
- The second one, identified with a circle with a diagonal bar through it (A No Parking sign in Europe) indicates that the IP address cannot be resolved to an IP host name using a DNS server, or the IP host name cannot be resolved to an IP address
- A general workstation icon indicates that the unit responds to a PING, but either it does not respond to an SNMP request, or it responds to SNMP but with an unrecognizable string
- Two units represent a group
- A unit with a lightning bolt represents a Power PC based unit such as a S/100, S/300 or S/1000
- A unit with a yellow flash and a green center represents a NetVista Express Flash based Unit
- A unit with a  starburst or sun (yellow center and green outline) represents a V2R1 station, such as a N2200 or N2800.
- Note that for the last three icons, a grayed out version of the icon indicates that a contact was successfully established with that unit sometime in the past but that it does not currently respond to a PING

# How Does it Work?

**NetVista**

**TCM Operations Utility**

IBM NetVista Thin Client Manager Op

File   Options   Tasks   Help

Thin Client Express
  s1000eth.raleigh.ibm.com/9.67.2
nonExpress
  babyblue.raleigh.ibm.com/9.67.2:
  s2800eth.raleigh.ibm.com/9.67.2

Flash Update...
Authenticate from Server...
Boot from Server...
Boot from Flash...
Shut Down or Reboot...
Wake On LAN...

**FTP**

**NetVista Thin Client Express**

**NS Boot**

**SNMP Agent (snmpd)**

**FTPd**

**Telnetd**

**NVRAM Settings**

**Other settings**

**Flash Card**

**NFSd**

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# Notes

We will, in a moment, take a look at the individual tasks that can be performed by the Operation Utility. Before we do so, it may help to describe how most tasks work since they basically all work in a similar fashion.

Most operations are performed on the workstation by an SNMP agent as a result of receiving a request from the Operation Utility. Requests are sent from the Utility to the SNMP agent in the form of SNMP frames, which contain either a get request, to get the value of a particular piece of data such as the workstation's MAC address for example, or a set request, which is used to change the values of an existing variable, such as the IP address of a configuration server for example.

Most variables, or pieces of data, reside in NVRAM but others are located in specific files, such as the update.conf file for example that contains a URL to an update server.

The SNMP agent running on the workstation responds to the Operations Utility requests by either sending back a piece of information or taking an action, such as rebooting the station for example. In some cases, actions are delayed until a reboot, such as when changing NVRAM values that become effective when the station reboots.

The diagram illustrated here also shows a few other components, such as an FTP daemon that can be started or stopped by the SNMP agent and is required for Backup/Restore of configuration files and a Telnet daemon for telnetting into the station. There is also an NFS daemon allowing peer booting.

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# The Reboot Task

- **Issues a PING to see if station is responding**

- **Issues an SNMP set request to get the SNMP agent on the station to cause a reboot**

**TCM Operations Utility**

**Reboot 9.67.239.55**

9.67.239.55

**SNMP Agent**

**NVRAM Settings**

**Other settings**

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## Status Messages

```
expressl.raleigh.ibm.com/9.67.239.55/00.06.29.23.02.9d

Ping operation: Operation completed successfully

Reboot Operation: Operation completed successfully

        Community Name Used: Workstation Write Community Name
```
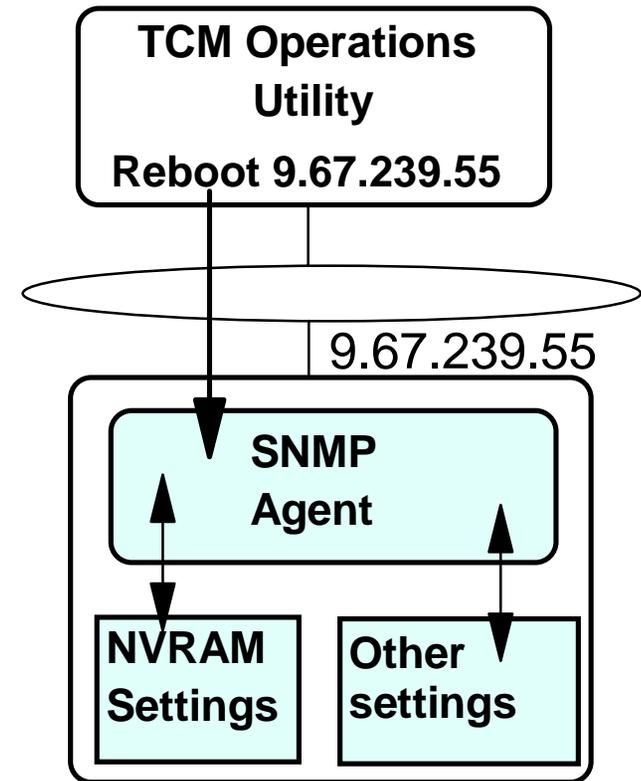
## Sample Trace

| Frame | Time | Src MAC Addr | Dst MAC Addr | Protocol | Description |
|---|---|---|---|---|---|
| 2 | 5.965000 | NSEDW2K | *BROADCAST | ARP_RARP | ARP: Request, Target IP: 9.67.239.55 |
| 3 | 5.966000 | Xpress | NSEDW2K | ARP_RARP | ARP: Reply, Target IP: 9.67.239.51 Target H... |
| 4 | 5.966000 | NSEDW2K | Xpress | ICMP | Echo: From 09.67.239.51 To 09.67.239.55 |
| 5 | 5.966000 | Xpress | NSEDW2K | ICMP | Echo Reply: To 09.67.239.51 From 09.67.239.55 |
| 6 | 6.231000 | NSEDW2K | Xpress | SNMP | SNMPv1; community = ibmncd; Set request; Re... |
| 7 | 6.975000 | Xpress | NSEDW2K | SNMP | SNMPv1; community = ibmncd; Response; Reque... |

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# Notes

Let us take a look at the Reboot task, as a first simple example. In this chart, we show that a Reboot is basically made up of a PING, to verify that the station is active, and then an SNMP set request, which in this case is a reboot request.

In our example, the administrator selects a workstation in the list, whose address happens to be 9.67.239.55, and selects the Reboot task. The next events are illustrated at  the bottom of the page in an extract from a Network monitor trace.

- Frames 2 and 3 are from the communications stack that issues an ARP to get the MAC address of the station.
- At frame 4 and 5, the Utility issues an ICMP Echo and gets an ICMP reply back (essentially doing a PING to verify that the unit is operational).
- At frame 6, it issues an SNMP set request to set the value of a particular object to a value. In this case, the object identifier for example might be 1.3.6.1.4.1.4396.1.2.3.2.0 (this is SNMP nomenclature for identifying objects) and this object or variable is set to the value 5 (whatever).
- At frame 7, the SNMP agent on the station returns a positive response indicating that this object was successfully set.
- The SNMP agent takes action by rebooting the client.

Right above the trace extract is a listing of the status messages that appear in the Operations Utility status area indicating that both the PING and Reboot operation were successful.

Notice that frame 6 in the trace shows the community = ibmncd which is similar to a password being used for getting and setting SNMP variables. We will discuss this later in more details.

# Details of an SNMP request

## Trace of a flash update

| Frame | Time | Src MAC Addr | Dst MAC Addr | Protocol | Description |
|---|---|---|---|---|---|
| 37 | 14.175000 | NSEDW2K | *BROADCAST | ARP_RARP | ARP: Request, Target IP: 9.67.239.55 |
| 38 | 14.175000 | Xpress | NSEDW2K | ARP_RARP | ARP: Reply, Target IP: 9.67.239.51 Target H... |
| 39 | 14.175000 | NSEDW2K | Xpress | SNMP | SNMPv1; community = robert; Get request; Re... |
| 54 | 14.892000 | Xpress | NSEDW2K | SNMP | SNMPv1; community = robert; Response; Reque... |
| 55 | 14.951000 | NSEDW2K | Xpress | SNMP | SNMPv1; community = robert; Set request; Re... |
| 56 | 15.069000 | Xpress | NSEDW2K | SNMP | SNMPv1; community = robert; Response; Reque... |

## Details of an SNMP frame

```
SNMP: SNMPv1; community = robert; Set request; Request ID = 255; Length = 127 (0x7F)
   SNMP: Message type = SNMPv1
   SNMP: Version = 0 (0x0)
   SNMP: Community = robert
SNMP: PDU type = Set request
   SNMP: Request ID = 255 (0xFF)
   SNMP: Error status = noError (0)
   SNMP: Error index = 0 (0x0)
SNMP: Sequence
  SNMP: Sequence
     SNMP: OID = 1.3.6.1.4.1.2.6.169.2.43.0
     SNMP: Integer Value = 1 (0x1)
  SNMP: Sequence
     SNMP: OID = 1.3.6.1.4.1.2.6.169.2.47.0
     SNMP: String Value = nfs://9.67.239.49/NS/flashbase/x86/NS-x86-2200-e-032-010-01.BOM
```

## Object Identifier

## Value

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# Notes

For those who might be interested in a few more details, here is an example showing the details of an SNMP frame, as taken from a Network Monitor trace of a Windows NT when doing executing a Flash Update task from the Operations Utility.

At the top is the summary of the trace that shows the normal ARP done by the underlying communication stack, then an SNMP get request and response (frames 39 and 54) and a set request and response (frames 55 and 56).
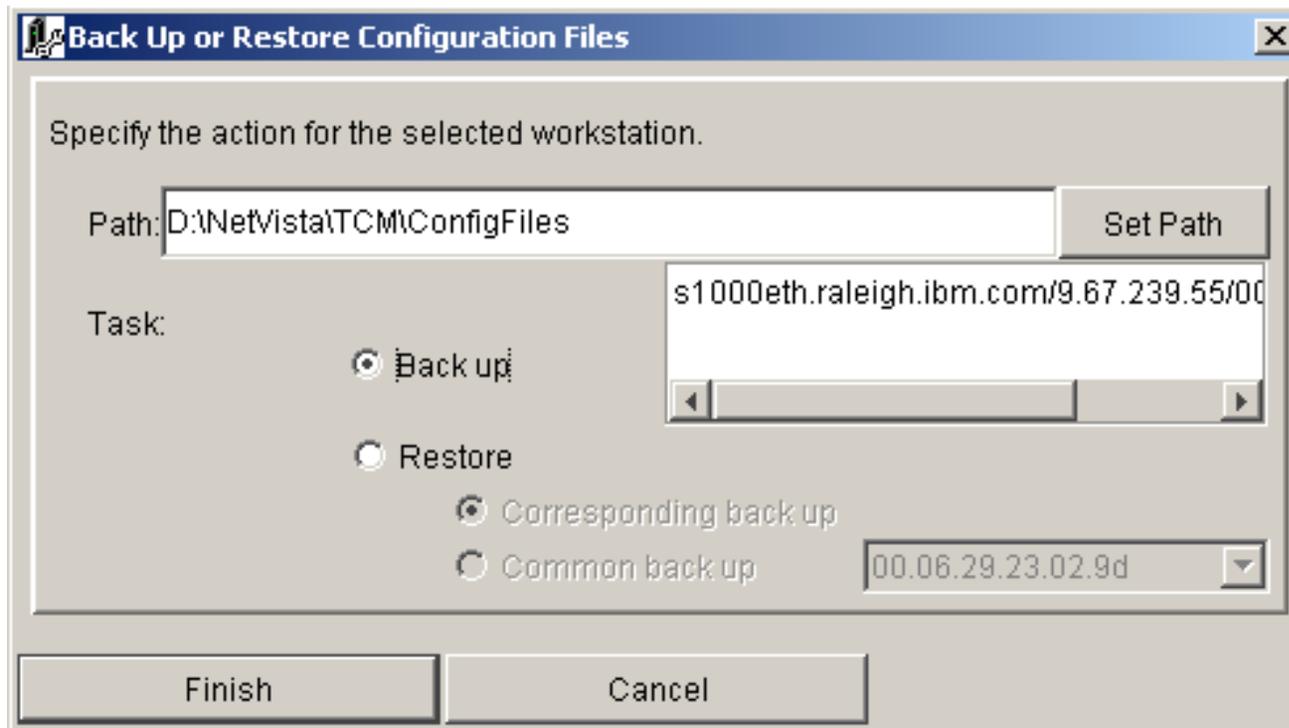
The bottom part of the chart shows an expansion of the set request to show more details. These details may not be important but they may give you a better feel for how it works. What this shows is that the set request is for two SNMP variables, identified (using the standard SNMP nomenclature) with their OID (Object Identifier).

In this case, it sets OID 1.3.6.1.4.1.2.6.169.2.43.0 to the value 1 and OID 1.3.6.1.4.1.2.6.169.2.47.0  to the URL identifying the update server to contact for a flash update (nfs://9.67.239.49/NS/flashbase/x86/..... etc.etc.)

In a problem determination situation, this type of trace could be used to verify the requests that get transmitted to the station.

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# Back Up/Restore Configuration Files

**NetVista**

Back Up or Restore Configuration Files

Specify the action for the selected workstation.

Path: D:\NetVista\TCM\ConfigFiles        Set Path

Task:

s1000eth.raleigh.ibm.com/9.67.239.55/00

○ Back up

○ Restore

  ○ Corresponding back up

  ○ Common back up        00.06.29.23.02.9d

Finish                    Cancel

- **Backup configuration files, from one or more workstations**

- **Restore configuration, from one or more workstations**

- **Allows for cloning of workstations**

# Notes

One of the most important function that the Operations Utility allows is the backing up and restoring of the configuration files from/to a client.

This function can be used with the normal intent of simply taking a backup of the configuration files on a client in the event that the flash card has to be recreated, for any reasons.

It can also be used as a process to clone workstations by pulling the configuration files from one client and pushing those files back down to multiple other stations, effectively cloning this client into multiple replicas. This is a significant time saver in large rollout where groups of workstations are essentially the same.

Notice the following in the illustration:

- The path indicates which directory, on the server where the operations Utility is executing, will be used to store the configuration files. The configuration files are stored under a directory based on the MAC address of the station. We will see an example in the next pages.
- The window right below the words "Set Path" simply lists all the stations that were selected and to which the backup applies
- If you select Restore instead of Backup as an operation, then there is an additional selection that can be made
  - The "Corresponding Backup" simply means, for each workstation that has been selected, to restore the files that correspond to each workstation; in other words, simply put the files back to where they came from
  - The "Common Backup" on the other hand is what is used to do cloning because it is used to restore files that were taken from one workstation and restore them back to one or more other workstations. When you select "Common Backup," the field to the right opens up to allow the selection of a MAC address of the station that you want the files to originate from.

# What is Saved and Where?
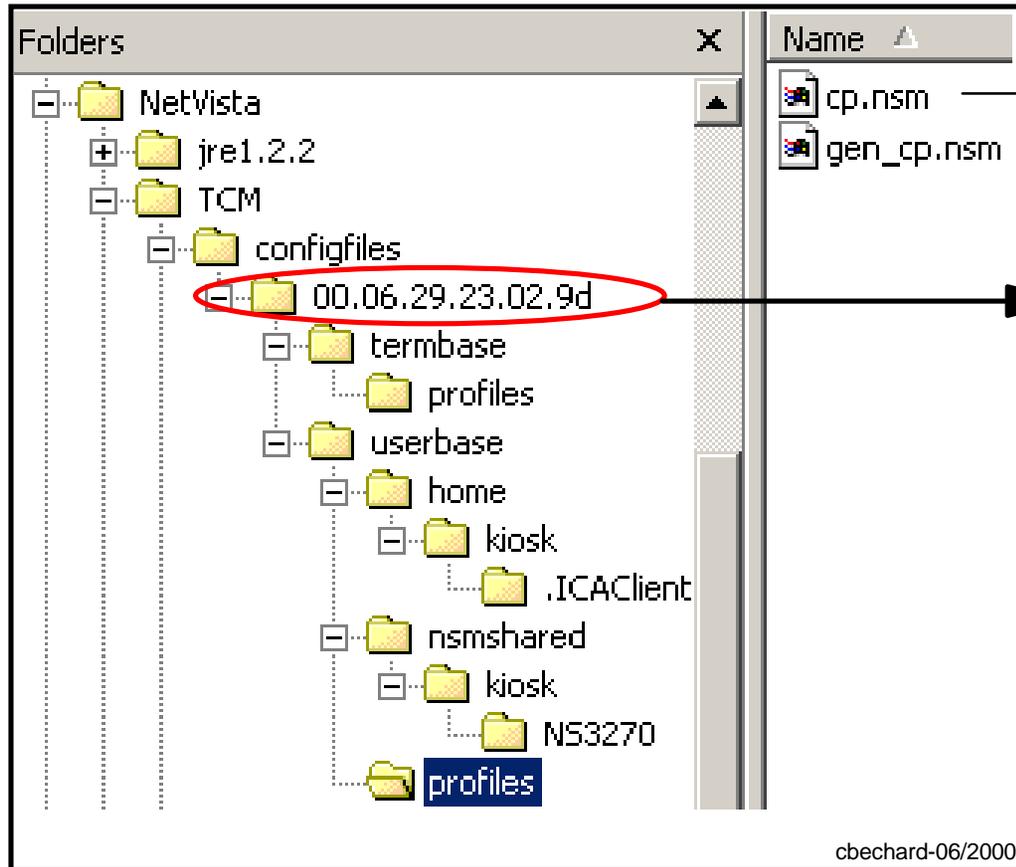


This is the primary configuration file

MAC Address of the station from which the configuration files were backed up

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# Notes

This shows the directories that were created on the server where the Operations Utility resides after doing a backup of the 00.06.29.23.02.9d workstation.

Although we can not show all the files in all the directories here, in general, the following files are backed up:

- The files that are explicitly backed up every time are cp.nsm, update.conf, and gen_cp.nsm.
  - cp.nsm is the main operational configuration and gen_cp.nsm is the bootstrap configuration that is used on the first initial boot, before the configuration tool is used for the first time. update.conf is the file that contains the URL used to update the flash card.
- Several other files, that are created though different configuration tasks, are backed up if they exist in the following directories:
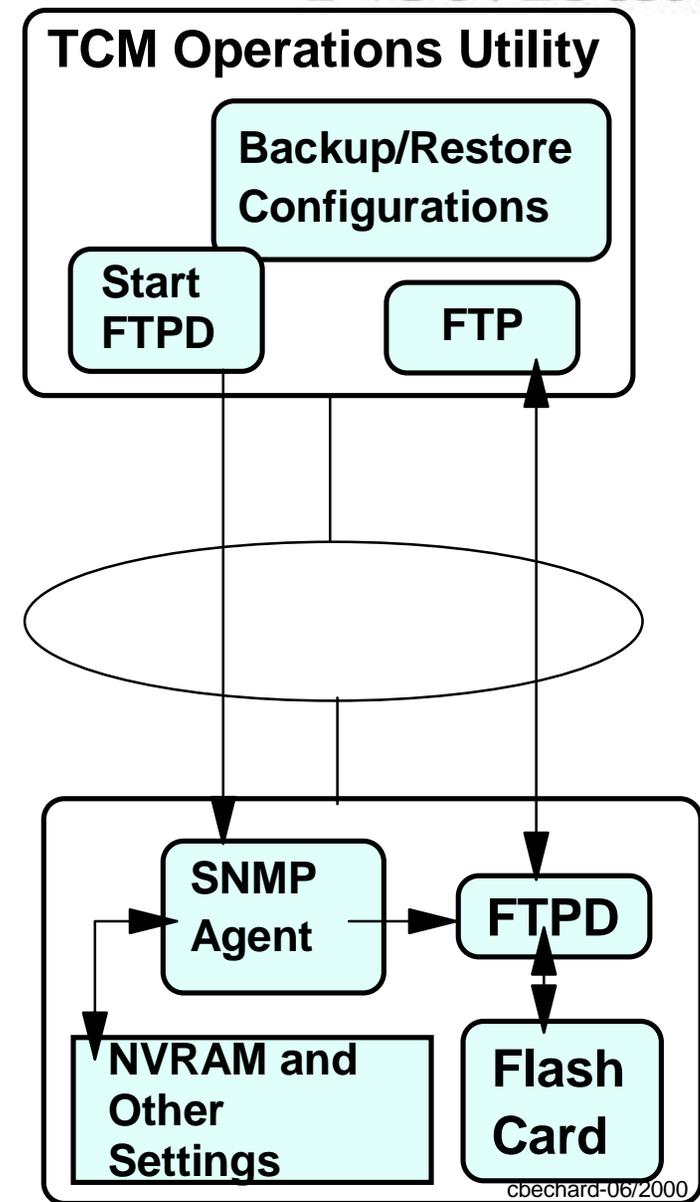  /userbase/home/kiosk/.ICAClient
  /userbase/nsmshared/kiosk/NS3270
  /userbase/nsmshared/kiosk/NS3270/K
  /userbase/nsmshared/kiosk/NS3270/C
  /userbase/nsmshared/kiosk/NS3270/P
  /userbase/nsmshared/kiosk/NS3270/W
  /userbase/nsmshared/kiosk/NS5250
  /userbase/nsmshared/kiosk/NS5250/K
  /userbase/nsmshared/kiosk/NS5250/C
  /userbase/nsmshared/kiosk/NS5250/P
  /userbase/nsmshared/kiosk/NS5250/W
  /userbase/nsmshared/kiosk/NSTERM
  /userbase/nsmshared/kiosk/NSTERM/K

# How Does Backup/Restore Work?

- **TCM Operations remotely starts the FTP daemon on the client, if it is not already active**

  - Note: The client must be configured to allow remote FTP operations, otherwise a message indicating "Cannot Access Variable: No Access" is issued when a backup is attempted.

- **TCM Operations then initiates an FTP operation, logging in as user root**

- **Files are uploaded to the server and stored in a directory named after the MAC address of the station**

**TCM Operations Utility**

**Backup/Restore Configurations**

**Start FTPD**

**FTP**

**SNMP Agent**

**FTPD**

**NVRAM and Other Settings**

**Flash Card**

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# Notes

The Backup/Restore function of the Operations Utility uses FTP to upload/download files from the client.

An FTPD daemon should be operational, by default, on the station. If the FTPD daemon is not active, the Backup/Restore function automatically issues a remote Start/Stop for the FTPD daemon before initiating an FTP session.

Note that the client must be configured to allow remote FTP operations for this to function. This is the default configuration, but if the configuration on the client has been changed to deny remote FTP operations, then a message "Cannot Access Variable: No Access" appears in the status display of the Operations Utility. This actually indicates that the SNMP variable for triggering the start/stop of FTPD cannot be set (because the client's configuration prevents it from being set).

Once the FTPD is started, the Operations Utility logs in to the FTPD daemon on the client as user root, and using the administrator password,  and it initiates transfer of the files discussed in the previous pages.

The Restore operation functions in a similar manner, except that, as discussed previously, there are two ways of doing a restore: Corresponding or Common.

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# Backup Status Messages Example

```
expressl.raleigh.ibm.com/9.67.239.55/00.06.29.23.02.9d
Ping operation: Operation completed successfully
FTPd Enabled/Disable Operation: Operation completed successfully
        Community Name Used: Workstation Write Community Name
Configuration File Operation: Operation completed successfully
        Community Name Used:


00.06.29.23.02.9d: 230 User root logged in.

00.06.29.23.02.9d: Completed processing /userbase/profiles
00.06.29.23.02.9d: Completed processing /userbase/profiles
00.06.29.23.02.9d: Completed processing /termbase/profiles
00.06.29.23.02.9d: Completed processing /termbase/profiles
00.06.29.23.02.9d: Completed processing /userbase/home/kiosk/.ICAClient
00.06.29.23.02.9d: Completed processing /userbase/nsmshared/kiosk/NS3270
```

**Progress...**

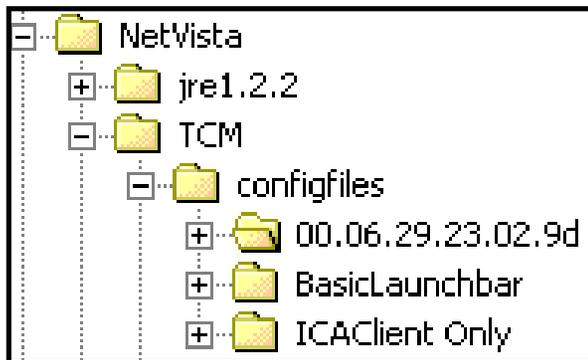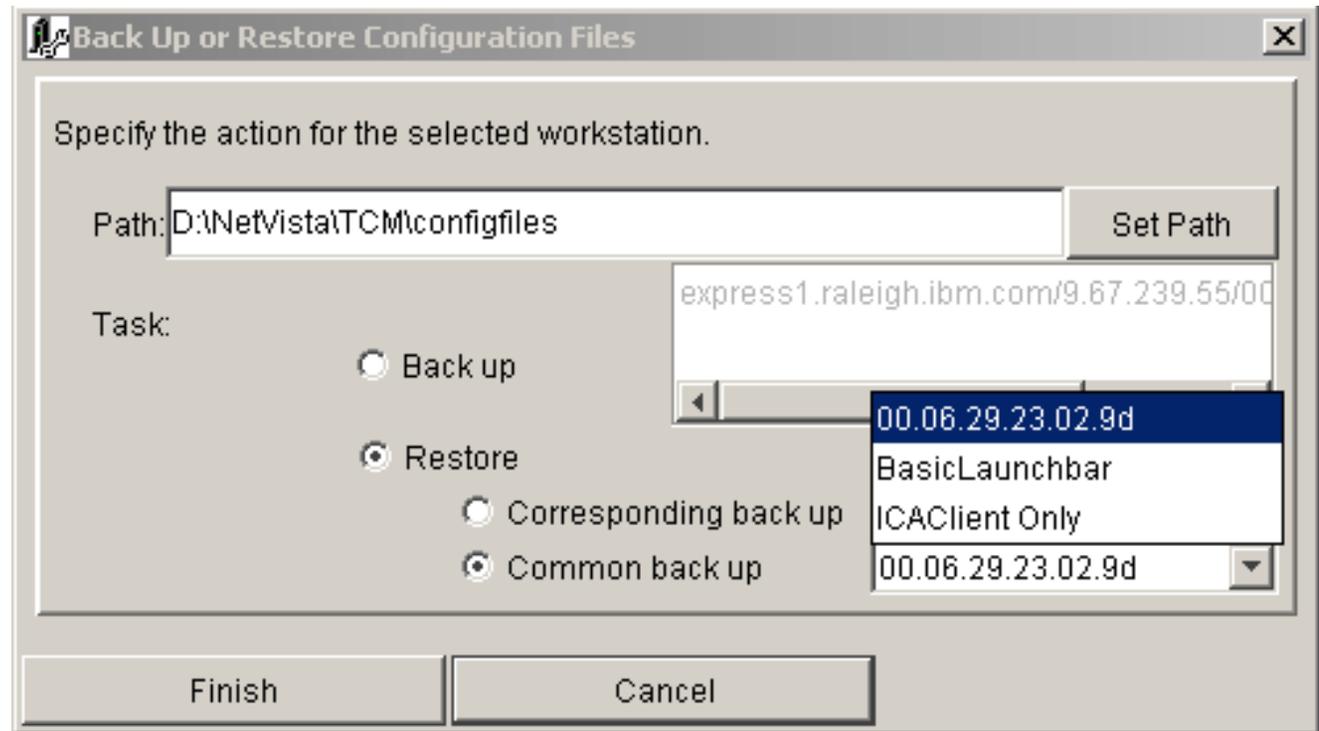express1.raleigh.ibm.com/9.67.239.55/00.06.29.23.02.9d

Cancel
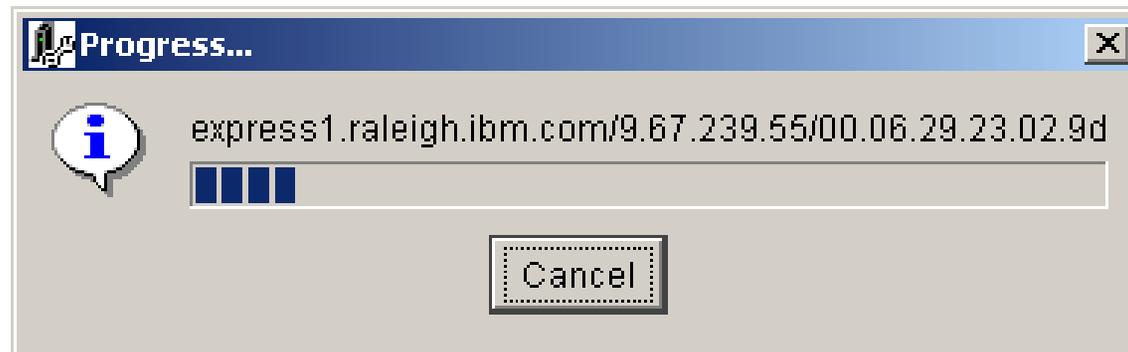
# Notes

Here is an example of the messages that appear in the status window of the Operations Utility during a Backup operation, indicating the progress of the backup operation.

There is also a popup window with a progress bar that appears to monitor the progress of the operation.

# Common BackUp Restore

**Back Up or Restore Configuration Files**  ×

Specify the action for the selected workstation.

Path: D:\NetVista\TCM\configfiles      [ Set Path ]

express1.raleigh.ibm.com/9.67.239.55/00

Task:

- ○ Back up

- ◉ Restore
  - ○ Corresponding back up
  - ◉ Common back up    00.06.29.23.02.9d ▼

**00.06.29.23.02.9d**
BasicLaunchbar
ICAClient Only

[ Finish ]          [ Cancel ]

─ 📁 NetVista
　　⊞ 📁 jre1.2.2
　　⊟ 📁 TCM
　　　　⊟ 📁 configfiles
　　　　　　⊞ 📁 00.06.29.23.02.9d
　　　　　　⊞ 📁 BasicLaunchbar
　　　　　　⊞ 📁 ICAClient Only

# Notes

When using the Restore function to do a common backup Restore (essentially cloning), you can setup backup directories under names that are meaningful, such as ICAClientOnly for example.

Under that name, you store the configuration files extracted from a workstation that was configured with a single Citrix Independent Computing Architecture (ICA) Client and whenever there is a need to clone such a workstation, it is easy to pick such a name as opposed to the MAC address from which the backup set of files came.

This is simple matter of creating this directory, using Explorer, and copying into it the appropriate configuration files. You can also simply rename the MAC address under which it was originally saved to a meaningful name indicating the type of configuration files.

When you use the Restore function, and select "Common backup," the drop-down list opens up and lists whatever directories are under the path that you selected.

# Other Backup/Restore Considerations

- **On a backup, the following are not saved with the config files**
  - Administrator password
  - SNMP community names
  - Grant/Deny Configuration Tool Access values

- **Cumulative Backups and Restores**
  - Prior to doing a backup for the same workstation, delete the directory containing the backup files from the previous backup
  - Prior to doing a Restore to the same workstation, reset the Configuration Tool Settings and the Application Created Settings

# Notes

There are a few other Backup/Restore considerations that one should be aware of

- First, on a backup, the Administrator password, the SNMP community names and the Grant/Deny Configuration Tool Access values are not saved along with the configuration files, so one should not expect that a Restore operation will set these values.

- On cumulative backups, that is when doing one backup after another of the same workstation, it is recommended to first delete the directories containing the previously backed up files in order to avoid the cumulative effect of files that were in the previous backup but are not on this new backup. For example, if a particular set configuration files from a workstation once had an ICA client defined, the backup directory contains a ...\userbase\home\kiosk\.ICAClient directory that contains two .ini files. If that workstation's configuration is now changed such that it does not contain an ICA Client, and a backup a the files is done to the same directory (MAC address of the station) the files bearing a similar names will replace the existing files but the files that are not present on the client will not cause a delete of the files that were on the server previously (in other words, the ICA Client files remain in the set of backup files even though they are no longer present on the client).

- On cumulative restores, the same principle applies and a reset of the Configuration Tool Settings and the Application Created Settings should be performed before doing a new restore in order to get rid of previous files that are no longer part of the new set of configuration files.

# Flash Update Task



- **Flash Update causes the station to contact a server and to download to its flash card updated components**

- **A Bill of Materials (BOM) file is a file located on both the client and the server that contains the list of components installed on the flash card and a time/date for each component**

- **It requires the Express Service Utility to be installed on a server**

# Notes

What is a flash update?

A flash update is the process of downloading from a server updated (or new additional) components to replace those that are already written on the flash card of a client. Note that this process is done on a file by file basis; that is, the update process only rewrites the files that have been changed.

Normally, a flash update only concerns the operating system files and not the configuration files. Those configuration files are updated either locally from the Configuration Tool on the workstation or remotely from the Operations Utility which can download new or updated configuration files.

This process is controlled by a Bill of Materials (BOM) file, a copy of which is located on both the client and the server, and this file contains the list of components installed on the flash card with a time/date for each component.

When a flash update is requested, the BOM file on the client is compared with the BOM file on the server; if a component's time stamp indicates that there is a newer version on the server, it is downloaded to replace the existing copy on the flash card. If the file indicates that there is a new component to be added, it is downloaded and added to the flash card.

If a component was on the flash card previously but is no longer required, and therefore not identified in the server's BOM file, it is simply left undisturbed.

# Flash Update - How does it work?

**NetVista**



Flash Update

Flash update

Server address  9.67.239.49

Server type  IBM NetVista Thin Client Express Service Utility (NT)

Flash file name  NS-x86-2200-e-032-010-01.BOM

Finish  Cancel

- **Two SNMP variables are set:**
  - One contains a string such as "nfs://9.67.239.49/NS/flashbase/x86/NS-x86-2200-e-032-010-01.BOM"
  - Another variable gets set with a value of 1 to indicate that a flash update should be done.

- **This causes the SNMP agent to:**
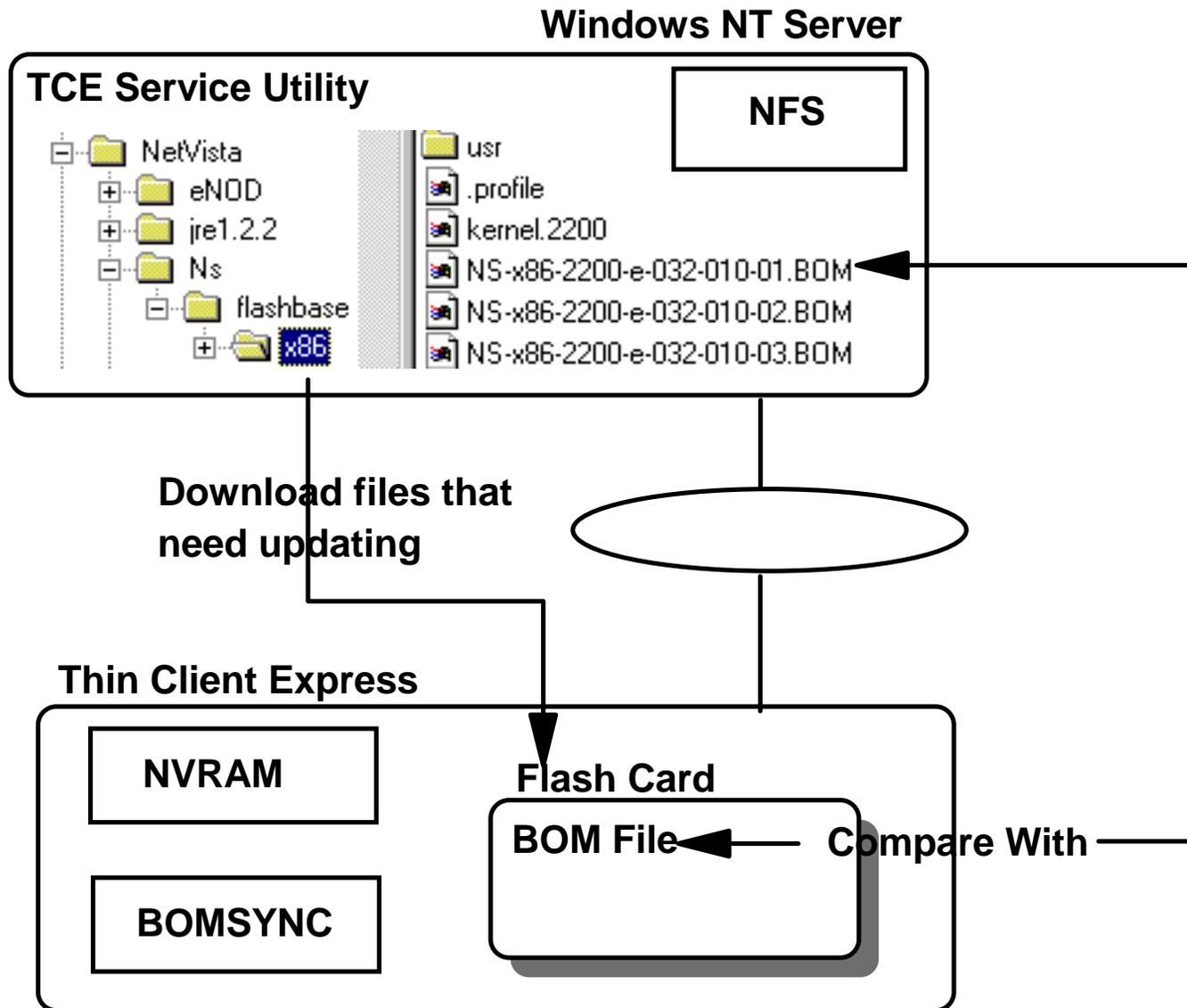  - Writes the string that contains the location of the BOM files to /termbase/profiles/update.conf
  - Set an NVRAM indicator to cause the BOMSYNC module to check the BOM files

- **When the BOMSYNC module runs, the NVRAM indicator causes it to compare the BOM files (and it gets the required URL from the update.conf file)**

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# Notes

As for other Operations Utility task, the Flash Update task sets SNMP variables that cause the SNMP agent on the station to take specific actions.

In this case, two SNMP variables are set:
- One contains a string such as "nfs://9.67.239.49/NS/flashbase/x86/NS-x86-2200-e-032-010-01.BOM" based on the entries in the Flash Update Task panel. This string indicates the file system type, the server IP address, the directory and filename of the BOM file to use to compare to the station's BOM file
- Another variable gets set to indicate that a flash update is required

This triggers the SNMP agent on the workstation to:
- Write the string that contains the location of the BOM files to a file called /termbase/profiles/update.conf
- Set a bit in NVRAM that will trigger the BOMSYNC module to compare the BOM files on the next reboot

When the BOMSYNC module runs at boot time, it checks the NVRAM bit to see if it needs to compare the BOM files, and if so, it gets the URL to contact from the update.conf file.

This function requires that the IBM NetVista Thin Client Express Service Utility be installed on a server (which does not have to be the same server as where the Operation Utility operates).

# What is the Express Service Utility?

**NetVista**

**Windows NT Server**

**TCE Service Utility**

```
□ NetVista                    □ usr
   ⊞ eNOD                     .profile
   ⊞ jre1.2.2                 kernel.2200
   □ Ns                       NS-x86-2200-e-032-010-01.BOM
      □ flashbase             NS-x86-2200-e-032-010-02.BOM
         ⊞ x86                NS-x86-2200-e-032-010-03.BOM
```

**NFS**

**Download files that need updating**

**Thin Client Express**

**NVRAM**

**Flash Card**

**BOM File** ◄── **Compare With**

**BOMSYNC**

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# Notes

The Express Service Utility is another NetVista Utility which is a set of simple NFS-based services that are used to download files to a workstation.

Essentially, the Service Utility uses an **NFS server** function to download to a client a series of files, located in the **x86** directory, based on the contents of a **BOM** file.

The Service Utility can be installed on any Windows NT server. It does not have to be on the same server as the Operations Utility, and it can be installed on the same server as a NSM V1R3 or NSM V2R1.

See the NetVista Express Service Utility presentation for more details.

# Operations Utility vs Service Utility

**NetVista**

**Windows NT Server**

**Windows NT Server**

## TCE Service Utility

- NetVista
  - eNOD
  - jre1.2.2
  - Ns
    - flashbase
      - x86
- usr
- .profile
- kernel.2200
- NS-x86-2200-e-032-010-01.BOM
- NS-x86-2200-e-032-010-02.BOM
- NS-x86-2200-e-032-010-03.BOM

## TCM Operations Utility

IBM NetVista Thin Client Manager Op

File   Options   Tasks   Help

Thin Client Express
- s1000eth.raleigh.ibm.com/9.67.2

nonExpress
- babyblue.raleigh.ibm.com/9.67.2
- s2800eth.raleigh.ibm.com/9.67.2

**Perform Flash Update**

**Remotely Trigger Flash Update**

**Thin Client Express**

**NVRAM**

**Flash Card**

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So what is the difference between the Express Service Utility and the TCM Operations utility when it comes to a Flash Update function?

The difference is illustrated here very simply by showing that the flash update itself is actually performed by the Express Service Utility whereas the Operations Utility is only a tool that can remotely trigger the flash update to occur.

When the flash update is requested on the client by the user doing an Immediate Flash Update, the Operations Utility is not even involved, and is not required to perform the flash update.

# Grant/Deny Access to Configuration Tool

**NetVista**

## Grant or Deny Access to Configuration Tool

Specify the action for the selected workstation.

- ⦿ Grant — Read write mode ▼
  - Current mode
  - Read only mode
  - **Read write mode**
- ○ Deny

Finish — Cancel

### Configuration Tool Error

🚫 Your Network Administrator set this configuration tool to read-only mode. You cannot change configuration data.

OK

## Messages on the client

### Configuration Tool Error

🚫 Your network administrator has disabled the Configuration Tool on this Thin Client.

OK

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# Notes

Via this function, the administrator can restrict access to the local configuration tool on the workstation in order to prevent a user from modifying the configuration.

The user can start the Configuration tool interface but can only access the "View Network Information" function. A click on "Configure Workstation" or "Software Update" produces the message that is illustrated here at the bottom, informing the user that access to the configuration tool has been disabled by the administrator.

If Read-only mode is granted, the user can view the configuration parameters but cannot change them. The user is given a message to that effect, as illustrated here as well.

# Authenticate from Server

**NetVista**

**Boot Server**

**TCM**

**CFG**

## Authenticate from Server

Workstation configuration server

| | |
|---|---|
| Server address | 9.67.239.51 |
| Server type | Network Station Manager (NT) |
| Server directory | /NetworkStationV2/userbase/profiles |
| Server protocol | NFS |

| Finish | Next | Simplified |
|---|---|---|

**NetVista Express**

**Flash Card**

**Kernel**

**CFG**

**Appl.**

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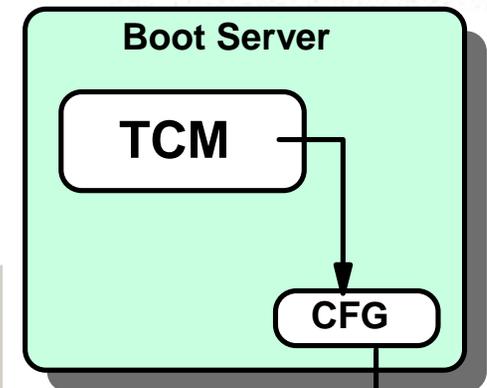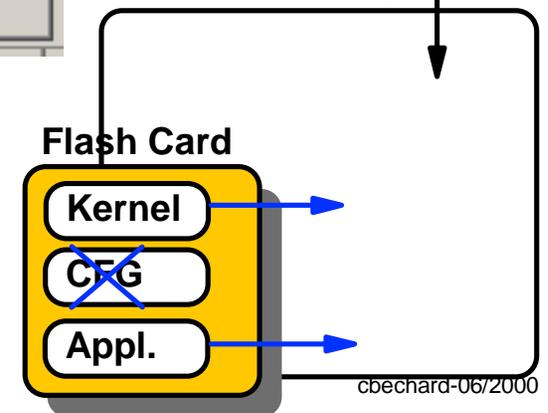
*IBM NetVista Thin Clients*

# Notes

The normal operation mode of a NetVista Thin Client Express is to boot from its flash card, which means loading its operating system (kernel) from the flash card, its configuration files and any application that needs to be loaded.

However, the Express client can also be transitioned to continue to load the its operating system and application from its flash card, but to use configuration files from a server on the network. This is called "Authenticate from a server" because the user at the workstation must first identify itself with a userid and password so that the configuration files customized for that user can be selected and downloaded to the workstation.

This mode is used in cases where there is a need for use of centralized configuration files while maintaining the ability for a faster boot and for a reduced network bandwidth by still loading the operating system and applications from a flash card.

# Boot From Server

**NetVista**

**Boot Server**

**TCM**

**Appl.**

**Kernel**      **CFG**

### Boot from Server

Boot server

| Server address | 9.67.239.49 |
|---|---|
| Server type | Network Station Manager (NT) |
| Server path | /NetworkStationV2/prodbase/x86/kernel.(x) |
| Server protocol | NFS |

Finish          Next          Simplified

**NetVista Express**

**Flash Card**

Kernel

CFG

Appl.

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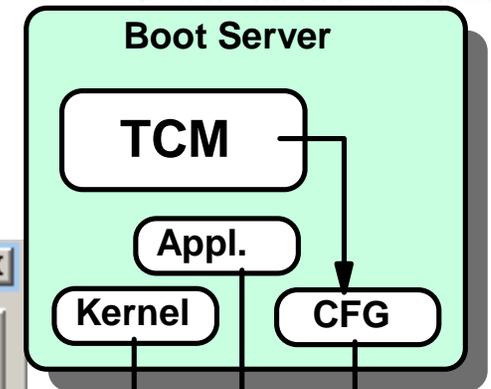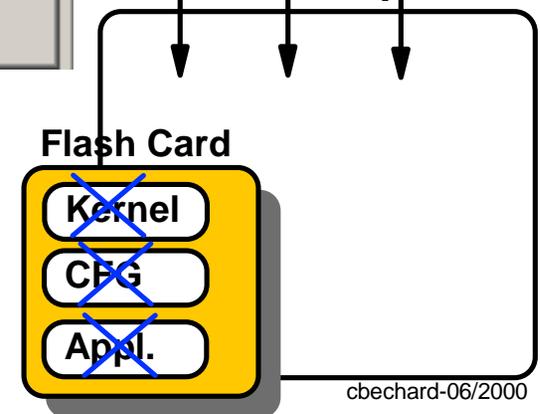
# Notes

The **Boot from Server** task is nearly identical to the **Authenticate from Server** task except that it now sets the workstation to also get its operating system and application(s) from a server instead of from the flash card.

In this case then, the final result is that the workstation is now operating as a V2R1 station and not as a flash-based Express.

# NVRAM Sample Settings

| | Boot from Flash | Authenticate From Server | Boot From Server |
|---|---|---|---|
| **Boot File Source** | Flash | Flash | Network |
| **Boot File Server** | 0.0.0.0 | 0.0.0.0 | 9.67.239.51 |
| **Boot File Server Directory/Filename** | /kernel.2200 | /kernel.2200 | /NetworkStationV2/prodbase/x86/kernel.2200 |
| **Boot File Server Protocol** | Disabled | Disabled | NFS |
| **Configuration Server** | 0.0.0.0 | 9.67.239.51 | 0.0.0.0 |
| **Configuration Server Directory/filename** | /termbase/profiles | /NetworkStationV2/userbase/profiles | /NetworkStationV2/userbase/profiles |
| **Configuration Server Protocol** | Flash | NFS | NFS |
| **Authentication Server** | 0.0.0.0 | 9.67.239.51 | 0.0.0.0 |

Assuming that the authentication server and/or boot server address is 9.67.239.51 and that it is an NT server

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# Notes

This table illustrates the changes that are made to the NVRAM settings by the SNMP agent when using the **Boot from Flash**, **Boot from Server** and **Authenticate from Server** tasks of the Operations Utility.

In this example, we have arbitrarily used 9.67.239.51 as a sample address for the boot server.

Note that in the **Boot from Server** case, only the Boot server value identifies the specific address of the server; indeed, the configuration server and authentication server IP addresses are set to 0.0.0.0 to indicate that the same address as the boot server is to be used.

# Reset to Factory Defaults

**NetVista**

**Reset to Factory Defaults**

Choose the configuration options to reset for the selected workstation.

- ☐ Reset all of the configurations below to factory default settings **+ NS Boot Settings**
  - ☐ Reset Configuration Tool settings
  - ☐ Reset administrator password
  - ☐ Reset SNMP community names
  - ☐ Reset software update server access configuration
  - ☐ Reset all application created settings

Finish        Cancel

**Done through the cfg tool (Launch Bar, etc...)**

Such as emulator colors

## Configure Software Update Server Access

Enter the Software Update Server IP address  `9.67.239.49`

Change the following two fields if the Update Server is not a Windows(TM) system

Firmware Update Server File System Type   `NFS`

Directory Path for the update file  `/NS/flashbase/x86`

Change the following field if a different model type or version is required

Software update file list name:  `NS-x86-2200-e-032-010-01.BOM`

# Notes

The Reset to Factory Settings task allows the reset of individual or all settings on the thin client. Note in particular:

- Reset the configuration tool settings resets only what was configured via the configuration tool on the workstation (which does not include the application created settings such as emulator color preferences for example).
- These application-created settings can be reset using the last check mark on the panel illustrated here
- The administrator password alone can be reset. This action actually eliminates the administrator password, which causes access to the configuration tool on the workstation and to the NS Boot Setup menus to be unrestricted, but at the same time removes the capability to telnet or FTP into the client.
  - This action though does not change the administrator password configured in the Operations Utility definitions for that unit, so care must be taken to make that change manually. To change the password (as opposed to eliminating it), the Change Remote Access Authorization function is the one that should be used.
- The community names can be reset to their default values (IBMNCD is the default read/write name)
- The "Reset software update server access configuration" resets the address of the software update server to 0.0.0.0. The illustration here shows the configuration panel on the client's configuration tool where this data is entered.
- If "Reset all of the configurations below ..." is chosen (or if the configuration items are all individually selected), then not only are all the specific identified settings reset but the NS Boot NVRAM settings are also reset and someone must physically be at the workstation to reset the basic parameters such as keyboard language and display resolution and IP data (if DHCP is not used). So the Reset All should be used with more caution when used remotely.

# Community Names

Group Data

Station Data

**Thin Client Express**
└── s1000eth.raleigh.ibm.com/9.67.239.55/00.06.29.23.02.9d
nonExpress

**Display or Edit Workstation or Group** ✕

| | |
|---|---|
| Administrator password | nstation |
| Read Community Name | ibmncd |
| Alternate Read Community Name | public |
| Read/Write Community Name | ibmncd |
| Alternate Read/Write Community Name | public |

**Display or Edit Workstation or Group** ✕

| | |
|---|---|
| Workstation address | s1000eth.raleigh.ibm.co... |
| Model | model2200 |
| Release | v210 |
| MIB Version | 200006010000Z |
| Status | true |
| Configured as TCM Express | true |
| MAC address | 00.06.29.23.02.9d |
| Administrator password | nstation |
| Read Community Name | robert |
| Alternate Read Community Name | robert |
| Read/Write Community Name | robert |
| Alternate Read/Write Community Name | robert |

Community Name
Configuration Tool Ope
Community Name
Configuration Tool Ope
Community Name

cbechard-06/2000

# Notes

This page illustrates the SNMP community names that are defined in the TCM Operations Utility for a specific workstation.

Notice that there are community names that can be defined at the group level and at the workstation level. The panel in the top left corner is the group settings whereas the panel in the bottom right is the specific workstation settings.

The names are used as passwords, when the Operations Utility contacts a workstation in order to either read or write an SNMP variable.

On the workstation, these same four community names (Read, Read/write, Alternate Read and Alternate Read/write) also contain a value (the default is IBMNCD) and for any operation performed from the Operations Utility, the name configured in the Utility is compared with the name on the workstation. If they match, the operation is allowed; otherwise, the message is "Authorization failed."

**Note**: The community names on the thin client are stored in NVRAM (not on the flash card). Therefore, if the client is booted from a server at any point in time (instead of flash), the community names that are defined in TCM/NSM will overwrite the NVRAM values and these values will therefore need to be reset if they are different from those used by the TCM Operations Utility. Care should therefore be taken to make them the same if possible.

# Example of Using Community Names

```
Configuration Tool Operation: Cannot perform operation, authentication error
        Community Name Used: Workstation Write Community Name
Configuration Tool Operation: Cannot perform operation, authentication error
        Community Name Used: Workstation Alternate Write Community Name
Configuration Tool Operation: Cannot perform operation, authentication error
        Community Name Used: Group Write Community Name
Configuration Tool Operation: Cannot perform operation, authentication error
        Community Name Used: Group Alternate Write Community Name
Configuration Tool Operation: Operation completed successfully
        Community Name Used: Default IBM Community Name
```

# Notes

Here is an example of the messages issued when the Operations Utility is trying to set an SNMP variable on the workstation.

In this example, we had set all variables on the workstation to the value "robert", except for the Alternate Read/Write, which we set to the value "IBMNCD".

The messages indicate that 5 attempts were made to set the variable.
- The first attempt used the workstation write community name.
- The second attempt was the workstation alternate write.
- The third was the group write.
- The fourth was the group alternate write.
-
- Finally, all having failed, it tries the default IBM value of IBMNCD, which succeeded since this is the value we had set on the workstation on the alternate write.

# Change Remote Access Authorization

# Notes

The administrator password and the SNMP Community names on the workstation can be changed by:
- Using the configuration tool on the workstation itself.
- Using the "Change Remote Access Authorization" function from the Operations Utility, as shown in this illustration.

If you use the "Change Remote Access Authorization", this changes BOTH the values stored in NVRAM on the station and the values in the Operations Utility that will be used for comparison when performing an Operation on a remote unit that requires a read or write of an SNMP variable.

If you want to change only the values in the Operations Utility, use the "Display or Edit Workstation or Group" function. Not sure why one would want to do this, but that can be done.

If you use the configuration tool on the client, that only changes the values stored in NVRAM.

# Configuration Tool - Client

**NetVista**

Software Update

○ Configure Remote Access Authorization....

○ Wait for Network Delivered Update....

○ Configure Software Update

○ Request Immediate Update

○ Allow remote access for FT

Configure Remote Access Authorization....

Administrator password: |nstation

SNMP Read Community Name: |IBMNCD

☐ Reset Read Community Name

SNMP Read Community Name Alternate: |IBMNCD

☐ Reset Read Community Name Alternate

SNMP Read/Write Community Name: |IBMNCD

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# Notes

On the client configuration tool's main panel, if you choose "Software Update," you will be presented with the first panel shown here, and then when selecting "Configure Remote Access Authorization ...," the second panel illustrated here appears, which allows you to change the SNMP community names used on the client.

These are the values that are stored in NVRAM and to which the values supplied by the Operations Utility will be compared.

● **Admin Password required for:**

– FTP operations (Backup/Restore or FTP Command alone)

– Telnet operations

– Controlling access to the NS Boot Setup Utility

– Controlling access to the Configuration Tool

● **SNMP Read/Write Community Name required for:**

– Flash Update

– Authenticate from Server

– Boot from Server

– Boot from Flash

– Shutdown or Reboot

– Start to Stop Telnet

– Change Remote Access Authorization

– Grant or Deny Access to Configuration Tool

– Reset to Factory Defaults

# Notes

When is an administrator password or an SNMP read/write community name required?

The admin password is required for any Telnet or FTP operations, which includes the Backup/Restore operation. Without having an admin password set, these operations cannot be performed. The password also controls access to the NS Boot Setup Utility and to the configuration tool on the workstation. If there is not a password set, then access to these is not controlled.

Most tasks performed from the Operations Utility require an SNMP community name to be able to either get the value of an SNMP variable or to set it. The tasks listed here all require the read/write community name because they all need to set the value of an SNMP variable.

# Wake on LAN
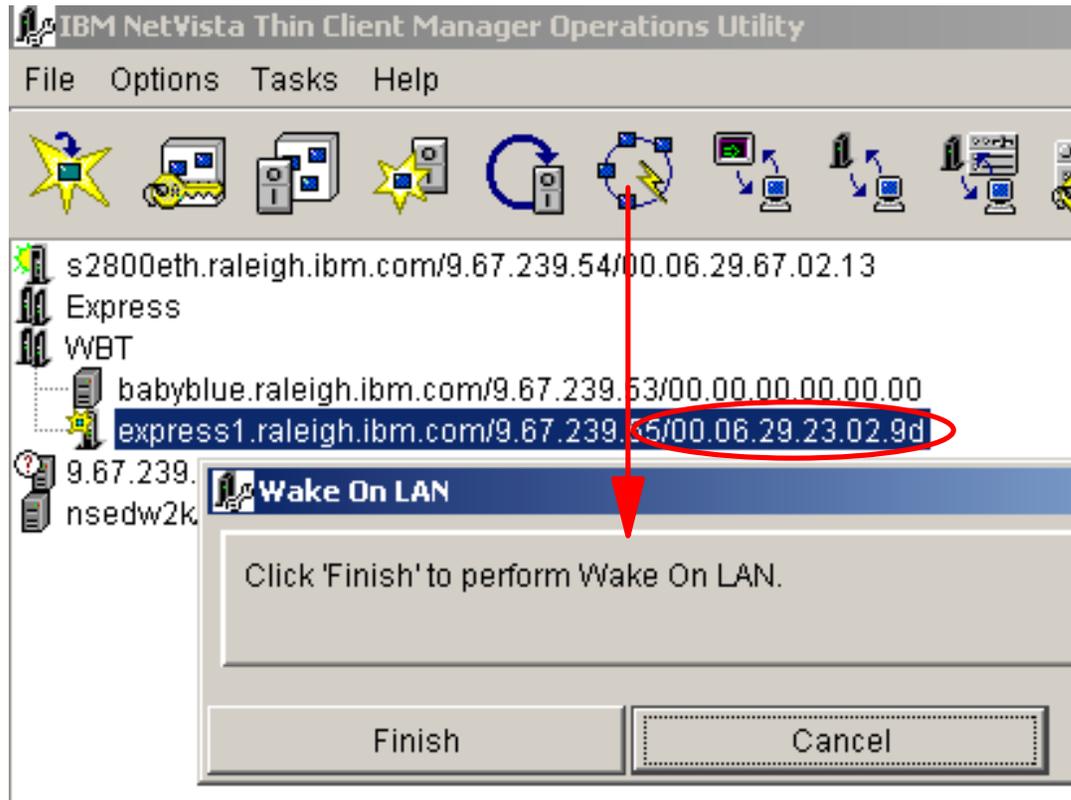
# Notes

The Wake on LAN task is to remotely power on a workstation.

Since the workstation is not active at the time that this operation is requested, it cannot be ARPed or PINGed. So how does this work?

The MAC address of the workstation has been previously obtained via an SNMP get request when the workstation was initially added and its status refreshed (causing the get of the MAC address).

The Operations Utility therefore seeds the ARP table with the MAC address of the station by temporarily creating an entry for the workstation to be powered on, and then issues the command to wake the station up, and then removes the entry from the ARP table.

# Wake on LAN - Details

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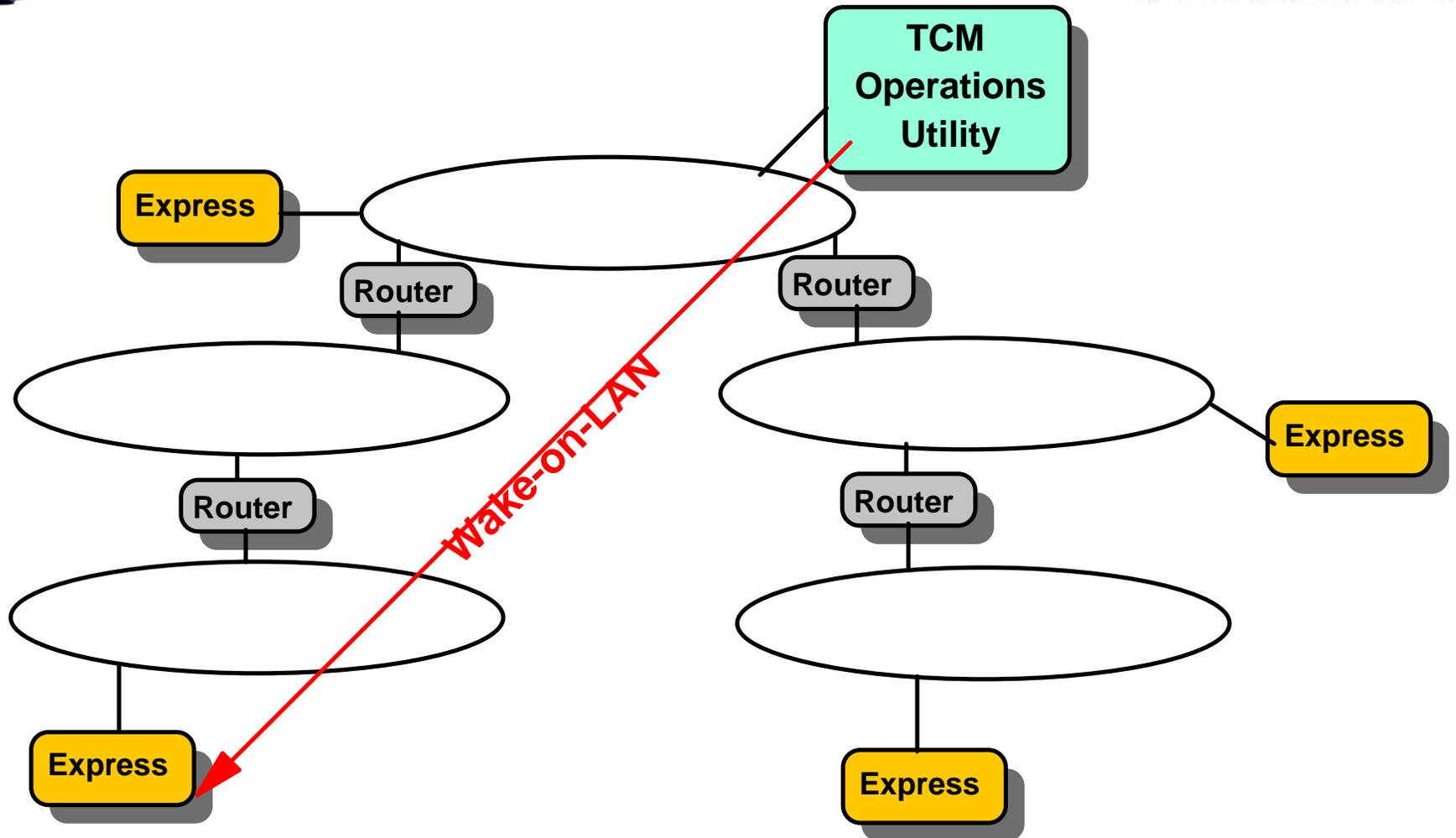
*IBM NetVista Thin Clients*

# Notes

For those again who have an appetite for more details on how things work, here is a bit more information taken from a Network monitor trace.

What this shows is that the Wake on LAN is a single UDP frame (frame 2 here), addressed to the target workstation (the name here is Express), with the data being 6 bytes of FFs followed by multiples entries of the station's MAC address, which is in this case is 00062923029D.

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# Across the Network

**NetVista**

TCM
Operations
Utility

Express

Router        Router

Express

Wake-on-LAN

Router        Router

Express        Express

All Operations Utility Tasks work across the network

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# Notes

Note that all tasks performed from the Operations Utility, including the Wake on LAN, work across a routed network and the workstations do not have to be located on the same LAN segment as the Utility or on a bridged segment .

This is because all tasks use IP frames and can therefore reach wherever an IP frame can reach in the network.

# Ordering/Installation

**NetVista**

- **Orderable on CD or Web Delivery**
  - URL: http://service.boulder.ibm.com/nc
  - Follow link to NetVista Utilities in the NetVista download section
  - Is a single file (tcmOpUtil.exe) of about 13MB
  - Download this file to a temporary directory and run it to start the installation.
  - Current README files are on this page also

**Downloads**

⇒ Thin Client Express Service Utility V1R1
Product ID 5648-D83
File name: tceServiceUtil.exe   size: ~16MB
- Readme

⇒ Thin Client Manager Operations Utility V1R1
Product ID 5648-D84
File name: tcmOpUtil.exe, size: ~13MB
- Readme

**CD Order Information**

⇒ Ordering Thin Client Utilities on CD

- **Supported Operating systems**
  - Windows NT Server 4.0 (Service Pack 4)
  - Windows NT Terminal Server Edition 4.0 (Service Pack 4)
  - Windows 2000 Professional (Beta Test Only)
  - Windows 2000 Server/Advanced Server (Beta Test Only)

- **JVM requirements**
  - The Operations utility requires a Java 1.2.2 environment.
  - Install will detect an installed 1.2.2 JDK/JRE and use it. If none exist, it will install a private 1.2.2 JRE if the user requests it.

- **Not necessary to reboot Windows after installing/uninstalling this product**

# Notes

The Operations Utility can be ordered on a CD or simply downloaded from the Web. It consists of a single executable file of about 13MB.

Simply download, execute and there is not even a need to reboot for the Utility to be operational.

It can be installed on any of the systems listed here.

**Note**: The Operations Utility requires that the display be able to operate in 256 colors or greater.

# Documentation

- **The Product Publication entitled "NetVista N2200e Thin Client Express Reference" (SA23-2803-00) is available from the HTTP://www.ibm.com/nc/pubs Web site**

  – It contains detailed steps for the installation and use of the Operations Utility.

- **The Operations Utility also contains online Help that can be consulted online or printed for reference.**

# Notes

It is recommended that you get the product publication from http://www.ibm.com/nc/pubs because it contains the detailed steps required to install the product and to operate the Utility.

Note that there is also online Help available from the Operations Utility that can either be consulted or printed.