NetVista™

Thin Client Manager Operations Utility Release 2 November 2001

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SA23-2813-03

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Note
Before using this information and the product that it supports, be sure to read "Notices" on page 37.

Fourth Edition (December 2001)

Contents

About this book

IBM® NetVista Thin Client Manager Operations Utility Release 2 (SA23-2813) provides information about the use of the Thin Client Manager Operations Utility Release 2 (hereafter referred to as Operations Utility).

This information includes a detailed description of the interface, tasks, and examples of how to use the Operations Utility.

Who should read this book

This information is for the person who administers the Thin Client Manager Operations Utility, and who manages NetVista thin clients.

Summary of changes

The IBM NetVista Thin Client Manager Operations Utility Release 2 includes the following changes:

- Ability to manage users and user groups by filtering resources (refer to **Filters** for more information)
- Support for retrieving profile components from a profile server.
- Profile Components can be stored to and retrieved from the Operations Utility.
- Global new operations (refer to **Setup Network Connections**, **Set Profile Components**, **Scheduling** for users and **Resource Reports**for users.)
- Support for Turbolinux 7.0 clients.
- Updates to the Operations Utility GUI window
- Updates to the product help

Related information

The following publications include information about managing the respective IBM NetVista thin client with the Operations Utility:

- *IBM NetVista N2200e Thin Client Express Reference* (SA23-2803)
- *IBM NetVista N2800e Thin Client Express Reference* (SA23-2808)
- *IBM NetVista N2200l Thin Client for Linux Reference* (SA23-2810)
- *IBM NetVista N70 Thin Client Reference* (SA23-2827)

These publications are available at the following web site:

`http://www.ibm.com/nc/pubs`

Information available on the World Wide Web

You can obtain the latest version of this information at the following uniform resource locator (URL):

`http://www.ibm.com/nc/pubs`

This is the same URL that is printed on the cover of this document.

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Introducing the Thin Client Manager Operations Utility

The IBM NetVista Thin Client Manager Operations Utility (hereafter referred to as Operations Utility) enables you to create lists, or groups of resources, and perform a variety of operations on those resources remotely. Before you can use the Operations Utility to perform a operation on a resource, you must make sure that you have:

- **On the server side:** Installed the Operations Utility on a server (for more information see "Installing the Operations Utility").
- **On the client side:**
  - Installed the resources that you want to manage remotely
  - Powered them on or enabled them to be powered on remotely (for more information see "Wake on LAN®" on page 15).

Installing the Operations Utility

You can install the Operations Utility on the following platforms, with the versions indicated or any supported subsequent versions:

Windows® platforms:

- Windows NT® Server 4.0
- Windows NT Server 4.0, Terminal Server Edition (TSE)
- Windows NT Workstation 4.0
- Windows 2000 Server
- Windows 2000 Professional
- Windows 2000 Advanced Server

Linux platforms:

- Turbolinux 6.0.4
- Redhat Linux 6.2, 7.1

Note: You may need to install additional software on your server to alter the flash image of a workstation(s) using the Operations Utility. For more information refer to the readme file for the server software that you are installing.

Installing the Operations Utility on a Windows platform server from the NetVista Thin Client CDs

There are two methods for installing the Operations Utility on a windows platform server.

- To install the Operations Utility from the NetVista Thin Client Utilities CD, insert the CD into a CD-ROM drive on the server. The IBM NetVista Thin Client Utilities menu starts automatically.

  Note: If the **Thin Client Utilities** menu does not start automatically, you can run the `install.bat` file from the root directory of the CD.

  To install the Operations Utility, click **Install NetVista Thin Client Manager Operations Utility**.

- To install the Operations Utility from the NetVista Thin Client with Turbolinux 7 CD, insert the CD into a CD-ROM drive on the server. You must start the IBM NetVista Thin Client Utilities manually from a command prompt. From the command prompt run the following command:

  `[CD drive]:\windows\products\tcmOpsUtil\setup.exe`.

Installing the Operations Utility on a Linux platform server from the NetVista Thin Client Utilities CD

To install the Operations Utility from the NetVista Thin Client with Turbolinux 7 CD perform the following operations:

1. Have the system administrator log on as root to install the Operations Utility
2. Run the `startx` command.
3. Open up an `xTerm` session.
4. Insert the NetVista TCM Operations Utility CD into a CD-ROM drive on the server.
5. Mount the CD drive.
6. Change the directory to `/mnt/cdrom/Linux/products/tcmOpUtil`.
7. Run the `installTCM.sh` shell found on the mounted drive.
8. Select one of the following options:
   - Press **Enter** to use the default install directory
   - Type the directory of your choice and press **Enter**

     If the directory does not exist, select one of the following when prompted to create the directory:
     - Type **y**
     - Press **Enter** to select the default of y.

   Note: Wait until you see the message ″Install script complete″ before exiting the xTerm session the `installTCM.sh` shell is running in.

Users other than root will need to be added to the tcm_admin group before they can run TCM.

Downloading the Operations Utility from the NetVista Thin Client web site

You can download the Operations Utility for both Linux or Windows from the IBM NetVista Thin Client web site.

To download the Operations Utility from the web site, you need to set up an update server. This update server must meet the following requirements:

- Reliable access to the Internet
- Runs File Transfer Protocol (FTP) or Hypertext Transfer Protocol (HTTP)
- Accessible by thin clients through a high-speed TCP/IP connection
- Sufficient space for the download files

After you have set up an update server, follow these steps to download the Operations Utility from the IBM Thin Client web site:

1. From the update server, open an Internet browser and go to the following URL:

   `http://www.ibm.com/pc/support`
2. Click **NetVista**.

3. Click **NetVista thin client**.
4. Under Software, click **Downloads**.
5. Under Utilities, click **Thin Client Utilities**.
6. From the **Downloads** box, click the item that you want to download.
   - **For Windows platforms:**
     a. Download the single `.exe` file for the Operations Utility to a temporary directory on your server.
     b. Run the `.exe` file to start the installation.
   - **For Linux platforms:**
     a. Download the single `.zip` file for the Operations Utility to a temporary directory on your server.
     b. Unzip the file.
     c. Start the installation process by running the `installTCM.sh` shell from the temporary directory.

   The Operations Utility, Thin Client Express Service Utility, and Readme files for each utility are available from this Internet site.

TCM Operations Utility services

Thin Client Manager Operations Utility Release 2 includes the feature of using two services which run all the time. These two services are the main TCM server and the Profile server. These services run as a service in a Windows NT/2000 environment and as daemons in the Linux environment.

The Profile server

The TCM Profile Server provides the client the ability to store and retrieve profile information to and from the server. Profiles are normally retrieved during device startup and user login. Profiles are stored on the server when the administrator creates the profiles. The TCM Profile server includes Tomcat 3.2.3.

TCM Tomcat (3.2.3) is the official Reference Implementation for the Java™ Servlet and JavaServer Pages™ technologies. TCM Tomcat is a light weight web server designed to support servlets. TCM uses Tomcat to support its Profile servlet which it invokes via HTTP requests.

When a device boots, it sends a request using HTTP to retrieve its profile components. after a device has retrieved its machine profile information, it then sends a request to retrieve the user profile information.

Refer to "Appendix B. Understanding profile components" on page 27 for more information on profile components.

Starting the Operations Utility

The TCM services should be started after installation. If for some reason the TCM services have not started, they can be started on Windows NT/2000 using the Services interface and on Linux by entering the command:

```
startTCM start
```

Starting the Operations Utility Interface

For Windows platforms:

To start the Operations Utility Interface on a Windows platform server:

From the Windows operations bar, click **Start—>Programs—>IBM NetVista Thin Client Utilities—>Operations Utility—>TCM Operations Utility**.

For Linux platforms:

To start the Operations Utility Interface on a Linux platform server:

1. Open up an xTerm session on your server
2. Enter `runTCM` at the command line prompt

After you start the Operations Utility Interface either from a Windows or Linux platform server, a window similar to this one appears on your display:

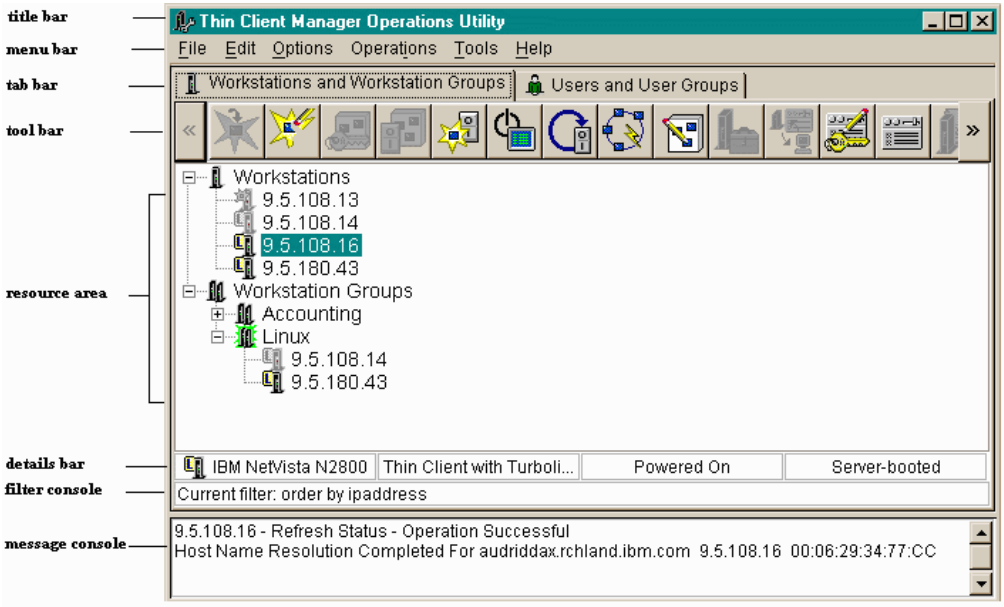

Figure 1. Operations Utility window

For more information about the interface, refer to "Understanding the Operations Utility interface".

Understanding the Operations Utility interface

Note: This publication includes an overview on various operations of the Operations Utility interface. For more detailed information refer to the product help available by clicking **Help—>Help Topics** from the menu bar.

There are eight parts to the Operations Utility interface:

1. The **title bar**, which displays the name of the active window.
2. The **menu bar**, which provides pull down options (see "Understanding the menu bar" on page 5).

3. The **tab bar**, which provides a view of the resource list for either workstations and workstation groups or for users and user groups. (see "Understanding the tab bar" on page 6).
4. The **tool bar**, which displays the operation icons (see "Understanding the tool bar" on page 7).
5. The **resource area**, which displays the resources or resource groups that you have added to the utility (see "Understanding the resource area" on page 7).
6. The **details bar**, which displays the current status of selected resource or resource group (see "Understanding the details bar" on page 8).
7. The **filter console**, which displays the current filter being used to subset the resources shown (see "Understanding the filter console" on page 9).
8. The **message console**, which displays the status of the operations that you perform (see "Understanding the message console" on page 9).

The **Progress Monitor** window, is displayed whenever an operation is run on a resource. It displays the status of all the operations that are performed and returns the successes, failures and warnings on each resource. If all the operations are successful then the Progress Monitor window disappears.

The **SNMP Trap Monitor** window, which displays remote events to servers.

The SNMP Trap Monitor window is available by clicking **Options—>Display Trap Monitor** from the menu bar (see "Understanding the SNMP Trap Monitor" on page 9).

Understanding the menu bar

The menu bar, located at the top of the Operations Utility window, includes the following operations:

- **File**
  - **New Resource** — add resource or resource groups to the resource area of the utility window (see "Understanding the resource area" on page 7 for more information).
  - **Filter** — specifies a filter to create a subset of resources (see "Using the Operations Utility filters" on page 9 for more information).
  - **Rebuild resource tree** —updates the resource tree according to the current filter.
  - **Save** — save the currently listed resources and their properties to a database.
  - **Exit** — exit the Operations Utility.
- **Edit**
  - **Find** — locates a specific resource in the resource list.
  - **Find Next** — locates the next resource listed in the resource list.
  - **Select All Workstations** —selects all the resources that appear under Workstations in the resource list (*Valid only when the Workstations and Workstation Groups tab is selected*).
  - **Select All Workstations Groups** — selects all the resources that appear under Workstations Groups in the resource list (*Valid only when the Workstations and Workstation Groups tab is selected*).
  - **Select All Users** —selects all the resources that appear under Users in the resource list (*Valid only when the Users and User Groups tab is selected*).

- **Select All User Groups** — selects all the resources that appear under User Groups in the resource list (*Valid only when the Users and User Groups tab is selected*).

- **Options**
  - **Display SNMP Trap Monitor** — display or hide the SNMP Trap Monitor window. For more information refer to the product help.
  - **Display Hostname** — displays the hostname of the workstations that are listed in the resource list (*Valid only when the Workstations and Workstation Groups tab is selected*).
  - **Display Mac Address** — displays the MAC address of the workstations that are listed in the resource list (*Valid only when the Workstations and Workstation Groups tab is selected*).
  - **Display Alias** — displays the alias name of the workstations that are listed in the resource list (*Valid only when the Workstations and Workstation Groups tab is selected*).
  - **Display Name** — displays the name of the users that are listed in the resource list (*Valid only when the Users and User Groups tab is selected*).
  - **Enable Confirmation Dialogs** — turn on and off the confirmation dialogs for the operations that you perform.
  - **Display Tool Bar** — to display the Tool Bar in the TCM Operations Utility GUI window.

- **Operations**

  Choose the operation from the drop down list. A greyed out operation or icon indicates that operation cannot be performed on that resource or resources.

- **Tools**
  - **Configure Tool Bar** — allows you to add or remove specific operation icons on the tool bar (see "Understanding the tool bar" on page 7 for more information).
  - **Server Setup for Flash Recovery** — specifies a server for recovering a flash file (see "Flash Recovery" on page 14 for more information).
  - **Set Default Profile Components** — specifies specific profile components to be used as system-wide defaults (see "Set Profile Components" on page 19 for more information).

- **Help**
  - **Help Topics** — provides the product help. It enables you to have access to all information regarding the use of the Operations Utility.
  - **About TCM** — provides product information.

Understanding the tab bar

The tab bar, located directly below the menu bar, provides a view of the resources in the resource area for either workstations and workstation groups or users and user groups.

Menu items and operations are dependent upon which tab is selected.

For example: If the **Workstation and Workstation Groups** tab is selected, then only the menu items or operations associated with those resources will be displayed. Operations available to workstation and workstation groups will be activated. Operations that are not available to those resources will be greyed out. The same applies for users and user groups.

Note: Not all operations that are available for Workstations and Workstation Groups are available for users and user groups.

Understanding the tool bar

The tool bar, located directly under the tab bar, displays icons that represent operations that you can perform on selected resources or resource groups.

Note: You can also access these operations by either; selecting **Operations** from the menu bar, or right-clicking on a resource (or groups) and selecting **Operations**.

The operation tool bar can be configured to allow the user to determine what operations will appear and in what order. Separators can be used to help with grouping of operations.

To configure the tool bar:

1. Select either the **Workstations and Workstation Groups** tab or **Users and User Groups** tab.
2. Select **Tools->Configure Tool Bar** from the menu bar.
3. From the Tool Bar Configurator window, configure the tool bar by moving items from either the **Available operations** list or the **Current operations on the Tool Bar** list.

   You can move selected items using three methods:

   - Select the items from a list and click the arrow on the middle panel to move the items.
   - Click on the items and drag and drop them to the other list.
   - Select an item from the **Current operations on the Tool Bar** list and move it to any position in the list by using the up and down arrows located on the right side of the Tool Bar Configurator window.

     You can also drag and drop the icon into whatever position within this list.

   Note: You can move as many tool bar separators as needed to the Current operations on the Tool Bar list by repeating the previous step.
4. Select from the following:
   - Select **Reset** to restore the operation lists to the previously saved tool bar configuration.
   - Select **Finish** to save current tool bar configuration and exit the window.
   - Select **Cancel** to cancel any changes to the tool bar configuration and exit the window.

Refer to “Using the tool bar” on page 13 for detailed descriptions and uses of each icon that appears on the tool bar.

Understanding the resource area

The resource area, located below the tool bar, displays a list of both individual resources and groups of resources. Workstations, users, workstation groups and user groups are also referred to here as a resource.

To the left of each resource in the resource area is an image that provides additional information about that particular resource. Position your mouse over the image for a text description of that image.

You can manage your resource(s) by right-clicking in the resource area or on a selected resource. A menu appears with the following operations:

- **Properties** — enables you to view and edit the properties of a resource.
- **New Resource** — enables you to add a new resource or resource group.
- **Delete Resource** — enables you to permanently remove a resource from the Operations Utility.
- **Add to** — enables you to add a resource to a resource group.
- **Remove from** — enables you to remove a resource from a resource group.
- **Select profile group** — enables you to select a specific group to be the profile group. The profile group is the group that the resource will get profile information from.
- **Rebuild list** — enables you to update the resources that appear underneath a dynamic group according to the group's filter.
- **Specify filter** — enables you to specify a filter for a dynamic or static group. When used for a dynamic group, it specifies which filter should be used in determining group membership. When used for a static group, it adds the resources that meet the specified filter to the group.
- **Operations** — enables you to choose a operation to use on a resource.

The Operations Utility supports the following features:

- You can select more than one resource from the list by pressing and holding the **Ctrl** key while making your selection.
- You can add resources to static groups by using the drag and drop feature.

Understanding the details bar

The details bar, located below the resource area, displays information about the resource that is currently selected in the resource area. The details bar is active only if you have selected a resource from the resource area.

The details bar displays the following information for the resource that you have selected:

For Workstations:

- Workstation Model
- Workstation Software Release
- Powered-on Status
- Other information, such as whether or not the workstation is running in kiosk mode, or booting from a CompactFlash card

For Users:

- user ID
- user name
- logged-in status

The details bar displays the following information for the resource group that you have selected:

For Workstation Groups:

- Workstation group name
- Workstation group type

- number of workstations in the group.

For User Groups:

- User group name
- User group type
- number of users in the group.

Note: Right-click on a resource and select Properties to view the details of that resource.

Understanding the filter console

The filter console, located below the details bar, displays the current filter being used to subset the resource or resources shown.

Workstations and users can be filtered to create subsets by specifying specific criteria attributes. Attributes for filtering workstations are different than the attributes used for filtering users. See "Using the filter panel" on page 10 for more information.

Understanding the message console

The message console, located below the filter console, displays status messages about the operation(s) performed on that resource.

You can clear the status messages by right-clicking within the message console, and selecting **Clear Message Console**.

Understanding the SNMP Trap Monitor

Note: This feature is only enabled for Linux Thin Clients.

The SNMP Trap Monitor, which is a separate window from the Operations Utility window, displays remote events to servers.

The Operations Utility SNMP traps function, allows you to have workstations automatically added to a list of workstations. This function also allows you to get traps from users logging into or out of workstations and have users added automatically to TCM.

You can use SNMP traps to automatically discover workstations on the network. Automatic discovery is accomplished by the workstations announcing themselves during booting to the Operations Utility through a SNMP trap message displayed in the SNMP Trap Monitor. The Operations Utility adds the workstations to the list.

Using the Operations Utility filters

Note: This publication includes an overview on the Operations Utility filtering feature. For more detailed information refer to the product help available by clicking **Help—>Help Topics** from the menu bar.

Filters provide a way to subset a large number of resources into a more manageable set of resources. You can use filters to subset workstations or users into a set with specific attributes.

Filters can be created using the command line.

Filtering the list of workstations or users:

You can specify a new filter to create a different list of workstations or users by:

Note: There are separate filters for filtering workstations and filtering users.

1. Selecting either the **Workstations and Workstation Groups** tab or the **Users and User Groups** tab.
2. Click **File—>Filter** from the menu bar.

Note: Filters only apply to workstations or users displayed in the resource tree, they do **not** apply to workstation or user groups.

The current workstation filter that is shipped with your TCM will sort all workstations by their IP address. The current user filter that is shipped with your TCM will sort all users by their user ID. These filters will be used the first time you start TCM.

When a new TCM session is started, the filters that were last used with that session will display that set of workstations or users in the resource tree.

Filters are constant in nature and are used to initialize the list of resources displayed. If a workstation or user is added that does not meet the initial criteria, it will still appear in the resource tree. This is the same for any resources that are added by using traps. Click **File—>Rebuild resource tree** to reapply the current filter.

There are two different types of resource groups that are used in the Operations Utility:

- **Static groups -** whose membership doesn't change unless a resource is explicitly added to or removed from it.
- **Dynamic groups -** whose membership is determined by the filter used. If a new member is added that meets the group's filter criteria, that resource will be considered a member of that group.

  Dynamic groups contain a reference to the filter used.

Using the filter panel

Filter panels are used for specifying the filter information used to subset resources and in creating filtered resource groups.

The filter panel can be used to modify an existing filter or to create a new filter.

Note: Filter attributes are dependent upon whether the **Workstations and Workstation Groups** tab or **Users and User Groups** tab has been selected.

The workstation and user filter panels are made up of three sections:

- **Filter Name** - provides a drop down menu that contains a list of all existing filters. Once you select an existing filter, that filter's criteria will appear in the criteria fields:
- **Criteria Fields** - contain specific attributes for a filter. There are three sections to the criteria section:

- **Operators:** For values that are fixed, only the equal (=) and not equal (<>) operators can be used. (See Table 1 for more information on using the operator characters.)
- **Value Fields:** Allows you to specify the attributes that you want used with the filter.
- **Sorting criteria:** Only one criteria field can be used to specify the sort criteria for that filter.

• **Task Buttons:**
- Click **OK** to apply the displayed filter information.
- Click **Clear** to remove all the filter criteria in the criteria fields.
- Click **Save** to save the filter information so it can be reused. Enter the name of the filter when prompted.
- Click **Delete** to delete the current selected persistent filter.
- Click **Cancel** to clear the current input of filter information and close the filter panel.

Note: For more detailed information refer to the product help available by clicking **Help—>Help Topics** from the menu bar.

Operators:

Table 1. Operators

Operators :	Description:
=	Will consist of one of the attribute values specified. More than one value can be specified for this attribute. If more than one value is used then the result will consist of either one or the other attribute values specified.
<>	Does not equals the attribute values specified. More than one value can be specified for this attribute. If more than one value is used then the result will consist of all attribute values specified.
>	Is greater than the attribute value specified.
<	Is less than the attribute value specified.
between	Is the values between the specified attribute value range. Two values must be specified.

If you specify more than one value for filter operators then the values must be separated by commas.

For Fields that have a string value, wildcard characters can be used with the equal (=) and not equal (<>) operators.

Table 2. Wildcard Characters

Wildcard:	Description:
*	Is the wild card character that matches 0 or more characters of the specified attribute value.
?	Is the wild card character that matches exactly one character of the specified attribute value.

Using the Operations Utility to remotely manage workstations

There are two basic steps to using the Operations Utility to remotely manage resources:

1. In the resource area, select the resource (workstation, user or group) that you want to perform a specific operation on.

   Note: For information on using different methods for adding resources to the Operations Utility, including using automatic discovery of workstations on the network, see the product help. Product help is available by clicking **Help—>Help Topics** from the menu bar.

2. Click the **icon** on the tool bar that corresponds to the operation that you want to perform.

   Position your mouse over an icon for a text description of that operation.

   You can also select operations from the menu bar by selecting **Operations**, or right click on a resource and select **Operations** from the drop down list.

Note: To complete a operation on a selected resource(s) you may be required to:

- Enter additional information
- Reboot the workstation for changes to take effect

You can check the status of a TCM operation through the progress monitor window.

The progress monitor is displayed each time a user runs a TCM operation on a resource or resources. The progress monitor displays all the resources selected for that operation and indicates whether they succeeded, failed or returned a warning. You can click on the failed resources to see the errors. If all operations complete without any failures then the progress monitor window disappears.

You can also check the status of the operations by viewing the Message Console, or in some cases, the SNMP Trap Monitor. See “Understanding the SNMP Trap Monitor” on page 9.

For more information on these operations refer to “Using the Operations Utility operations” on page 13.

Using the Operations Utility operations

The Thin Client Manager Operations Utility (hereafter referred to as Operations Utility) provides powerful, centralized client management tools in user-friendly interfaces:

- The Command Line Interface (CLI), also known as Power Scripting, is used to run TCM operations on your resources from a command line prompt.

  Commands may be combined in script files that may be run when needed or scheduled to run at specific times. Refer to the product help for more information on CLI.
- Operation icons are used to run TCM operations on your resources from a GUI.

  These icons appear on the tool bar (when configured) of the Operations Utility interface. To learn about the Operations Utility interface, see "Understanding the Operations Utility interface" on page 4.

You can find further information on each of the Operations Utility operations in the product help available by clicking **Help—>Help Topics** from the menu bar. Refer to "Understanding the menu bar" on page 5 for more information about the product help.

Using the tool bar

You can use the icons that are displayed in the tool bar to manage resources that you select from the resource area. Once you select a resource, the operation icons associated with that resource become active. Active icons are displayed normally while inactive icons are greyed-out. The Operations Utility only activates operation icons that are valid for the particular resource selected.

These icons are shortcuts to client management operations. You can also right-click on a resource and select Operations to access the operations available for that resource. Refer to"Appendix A. Operations and supported clients" on page 21 to find out which clients are supported for each Operations Utility operation.

Note: If you select multiple workstations resources from the resource area, the Operations Utility activates all valid operation icons for that selection of resources. That is, the Operations Utility will not perform a operation that is not valid for a selected workstation.

Software Update

Click the **Software Update** icon to update the flash image of a workstation by downloading a flash file from a server or another workstation. Refer to the product help for more details about this operation.

Flash Recovery

Click the **Flash Recovery** icon to rewrite the flash image of a workstation. The recovery server reformats the CompactFlash card and copies the recovery flash image to the workstation. Refer to the product help for more details about this operation.

For Turbolinux 7 thin clients, use the "Setup Network Connections" on page 19 icon to recover a flash image of a workstation.

Authenticate from Server

Note: This operation is not available for Linux thin clients.

Click the **Authenticate from Server** icon to configure a workstation to authenticate from a server that runs V2R1 IBM Network Station™ Manager (NSM). V2R1 NSM is not the same product as V2R1 Thin Client Manager Operations Utility Service Update 1.

Authenticating from a server provides the security of server authentication without compromising the speed of a workstation's boot from its CompactFlash card. Refer to the product help for more details about this operation.

Boot from Server

Click the **Boot from Server** icon to configure a workstation or workstation group to boot from a server. You can also use this operation to peer boot from a workstation that boots from flash. Refer to the product help for more details about this operation.

For Turbolinux 7 thin clients, use the "Setup Network Connections" on page 19 icon to configure workstations to boot from a server.

Boot from Flash

Click the **Boot from Flash** icon to change a workstation or workstation group resource's settings so that it boots from CompactFlash. Refer to the product help for more details about this operation.

For Turbolinux 7 thin clients, use the "Setup Network Connections" on page 19 icon to configure workstations to boot from the CompactFlash card.

Shutdown or Reboot

Click the **Shutdown or Reboot** icon to remotely shut down or reboot a workstation that you have selected from the resource area. Refer to the product help for more details about this operation.

Wake on LAN®

Click the **Wake on LAN (WOL)** icon to power on workstation resources from a remote location.

Most Operations Utility operations require you to power on the resources that you wish to manage from the Utility. One way to do this is to utilize the WOL feature. Refer to the product help for more details about this operation.

Advanced Workstation Configuration

Note: This is an **advanced** feature. The system administrator should be familiar with MIB variables and Simple Network Management Protocol (SNMP) functions.

Click the **Advanced workstation configuration** icon to work with the Management Information Base (MIB) variables of workstation resources. Refer to the product help for more details about this operation.

Attention

If you set incorrect MIB values, and you send them to workstation resources, you can cause the workstation resources to be unusable until you reset their configurations to factory default values. Do not send MIB variable values to workstation resources until you are sure that the values are correct.

Manage Services

Note: This Manage Services operation is not available for Linux thin client.

Click the **Manage Services** icon to enable you to manage services for selected workstations.

There are four services that can be managed using the Manage Services operation:

- Enable or disable access of workstations to their Configuration Tool.
- Configure a Thin Client Express workstation as a peer recovery server.
- Stop or start the FTP daemon on a Thin Client Express workstation.
- Stop or start the telnet daemon on a Thin Client Express workstation.

Refer to the product help for more details about this operation.

Backup or Restore Configuration Files

Click the **Backup and Restore Configuration Files** icon to back up or restore the configuration files of workstations that you have selected. You can back up or restore the configuration files for individual or multiple workstation resources. Refer to the product help for more details about this operation.

Note: This operation can be used to retrieve any files, including error logs, for inspection from a Linux thin client.

Change Client Remote Access Configuration

Click the **Change Client Remote Access Configuration** icon to change available remote access configuration settings for a workstation. The settings that you can change include:

- Administrator password
- SNMP read, read/write, read alternate, and read/write alternate community names

Refer to the product help for more details about this operation.

Reset to Factory Defaults

Click the **Reset to Factory Defaults** icon to reset the configuration of a workstation resource to the factory defaults.

Attention: Resetting all workstation configurations to the factory-default settings completely erases all previously configured workstation settings.

Refer to the product help for more details about this operation.

Client SNMP Trap Server Settings

Note: This Client SNMP Trap Server Settings operation is only available for Linux thin clients.

Click the **Client SNMP Trap Server Settings** icon to configure Linux thin clients to send SNMP trap messages to the Operations Utility server. **Trap messages** are alerts sent by the client to specified servers, indicating that some event occurred. Trap messages are a part of the SNMP protocol, and once properly configured, Linux thin clients can announce themselves to servers by sending these messages. Refer to the product help for more details about this operation.

For Turbolinux 7 thin clients, use the "Setup Network Connections" on page 19 icon to configure Linux thin clients to send trap messages.

Scheduling

Click the **Scheduling** icon to schedule a operation for workstations, users, workstation groups or user groups to be performed at a specified time. Refer to the product help for more details about this operation.

Set Inventory Attributes

Note: This Set Inventory Attributes operation is only available for Linux SU3 and later thin clients.

Click the **Set Inventory Attributes** icon to update the hardware inventory fields for Linux SU3 thin clients. Refer to the product help for more details about this operation.

Resource Reports

Click the **Resource Reports** icon to produce a table view of the attributes associated with the workstations or users you have selected. Refer to the product help for more details about this operation.

Broadcast Message

Note: The Broadcast Message operation is only available for Linux SU3 and later thin clients and for users logged into such a client.

Click the **Broadcast Message** icon to send a one way message to workstations or users. Refer to the product help for more details about this operation. When sending a message to a user, the message is sent to the workstations that the user is logged into.

Firmware Update

Note: The Firmware Update operation is only available for Linux SU3 and later clients. Firmware update is not valid for N70 thin clients.

Click the **Firmware Update** icon to update the NSBOOT firmware (boot monitor) of a workstation or workstations. Refer to the product help for more details about this operation.

Host Name Resolution

Click the **Host Name Resolution** icon to resolve the hostname for a workstation from it's IP address. Refer to the product help for more details about this operation.

Refresh Workstation Status

Click the **Refresh Workstation Status** icon to see if the selected workstations are active.

Note: The *ping* function is included in the **Refresh Workstation Status** operation. Therefore, when you click the **Refresh Workstation Status** icon, the Operations Utility server pings the workstation resources that you have selected.

The image to the left of each resource is updated when you click this icon. These images also indicate resource status.

A successful status refresh of a workstation enables the Operations Utility to obtain and display additional information about the workstation. This information includes the MAC address and hardware type-model of the workstation.

If the Operations Utility contacts an active workstation while refreshing the workstation status, the utility also determines if the workstation is a NetVista Thin Client or some other type of device. If the active workstation is an IBM NetVista thin client, the Operations Utility requests and stores the workstation's MAC address. This allows you to perform the Wake On LAN (WOL) operation on the workstation. For more information on WOL, see "Wake on LAN®" on page 15.

Set Profile Components

Click the **Set Profile Components** icon to select and change a groups profile. This operation will only take effect on Turbolinux 7 clients.

Note: The Set Profile Components operation is used only on Workstation Groups or User Groups.

To set profile components that will be used as system-wide defaults, use **Tools->Set Default Profile Components** from the main menu bar.

Refer to the product help for more details about this operation.

Setup Network Connections

Click the **Setup Network Connections** icon to configure workstations to communicate with their associated servers.

There are four operations that can be performed using the Setup Network Connections operation:

- Flash Recovery
- Boot from Server
- Boot from Flash
- Client SNMP Trap Server Settings

Note: The Setup Network Connections operation is only valid for Turbolinux 7 clients. For other clients refer to “Flash Recovery” on page 14, “Boot from Server” on page 14, “Boot from Flash” on page 14, and “Client SNMP Trap Server Settings” on page 16 to perform these operations.

Refer to the product help for more details about this operation.

Appendix A. Operations and supported clients

The majority of the operations available in the Operations Utility do not support the following client types:

- Workstations of unknown type
- Workstations that are not IBM Network Stations or IBM NetVista thin clients
- All IBM NetVista N2200w thin clients for Windows-based Terminal
- Series 100, 300, and 1000 IBM Network Stations
- Series N2200 and N2800 IBM Network Stations that are at PTF6 level code or earlier code of the IBM Network Station Manager program

Although the Operations Utility does not support these workstations, you can still see them in the workstation resource area of the Operations Utility window if they are on the same network. You may also be able to use the Operations Utility to refresh their status, and copy MIB variables from them.

See Table 3 on page 22 for a detailed list of operations and the workstation types that are supported for each operation by the Operations Utility.

Table 3. Operations Utility operations and supported workstations

Operations Utility operation	Workstations supported
 Software Update (see "Software Update" on page 13).	The following clients, only if flash memory is installed: • NSM PTF8+ N2200 and N2800 thin clients; • N2200e Thin Client Express (Service Update 1 or later); • N2200e and N2800e (Service Update 2 or later); • N2200l Thin Client for Linux (Service Update 1 or later); • N2200 (server-booted) and N2800 Thin Client for Linux (Service Update 1 or later); • N70 thin client with Turbolinux 7
 Flash recovery (see "Flash Recovery" on page 14).	The following clients, only if flash memory is installed: • NSM PTF8+ N2200 and N2800 thin clients (not booted by DHCP); • N2200e Thin Client Express (Service Update 1 or later) (not booted by DCHP); • N2200e and N2800e (Service Update 2 or later) (not booted by DCHP); • N2200l Thin Client for Linux (Service Update 1 or later); • N2200 (server-booted) and N2800 Thin Client for Linux (Service Update 1 or later)
 Authenticate from Server (see "Authenticate from Server" on page 14)	The following clients, only if flash memory is installed and are not booted by DHCP: • NSM PTF8+ N2200 and N2800 thin clients; • N2200e Thin Client Express (Service Update 1 or later); • N2200e and N2800e (Service Update 2 or later)
 Boot from Server (see "Boot from Server" on page 14)	The following clients, only if they are not booted by DHCP: • NSM PTF8+ N2200 and N2800 thin clients; • N2200e Thin Client Express (Service Update 1 or later); • N2200e and N2800e (Service Update 2 or later); • N2200l Thin Client for Linux (Service Update 1 or later); • N2200 (server-booted) and N2800 Thin Client for Linux (Service Update 1 or later)
 Boot from Flash (see "Boot from Flash" on page 14)	The following clients, only if flash memory is installed and are not booted by DHCP: • NSM PTF8+ N2200 and N2800 thin clients; • N2200e Thin Client Express (Service Update 1 or later); • N2200e and N2800e (Service Update 2 or later); • N2200l Thin Client for Linux (Service Update 1 or later); • N2200 (server-booted) and N2800 Thin Client for Linux (Service Update 1 or later)

Table 3. Operations Utility operations and supported workstations (continued)

Operations Utility operation	Workstations supported
 Shutdown or Reboot (see "Shutdown or Reboot" on page 15)	• NSM PTF8+ N2200 and N2800 thin clients; • N2200e Thin Client Express (Service Update 1 or later); • N2200e and N2800e (Service Update 2 or later); • N2200l Thin Client for Linux (Service Update 1 or later); • N2200 (server-booted) and N2800 Thin Client for Linux (Service Update 1 or later); • N70 thin client with Turbolinux 7
 Wake on LAN (see "Wake on LAN®" on page 15)	• NSM PTF8+ N2200 and N2800 thin clients; • N2200e Thin Client Express (Service Update 1 or later); • N2200e and N2800e (Service Update 2 or later); • N2200l Thin Client for Linux (Service Update 1 or later); • N2200 (server-booted) and N2800 Thin Client for Linux (Service Update 1 or later); • N70 thin client with Turbolinux 7
 Advanced workstation configuration (see "Advanced Workstation Configuration" on page 15)	This operation is independent of workstation restrictions.
 Manage Services (see "Advanced Workstation Configuration" on page 15)	• NSM PTF8+ N2200 and N2800 thin clients; • N2200e Thin Client Express (Service Update 1 or later); • N2200e and N2800e (Service Update 2 or later)
 Backup and Restore Configuration Files (see "Backup or Restore Configuration Files" on page 16)	The following clients, only if flash memory is installed: • N2200e Thin Client Express (Service Update 1 or later); • N2200e and N2800e (Service Update 2 or later); • Flash-booted N2200l and N2800 Thin Client for Linux (Service Update 1 or later); • Flash-booted N70 thin client with Turbolinux 7

Table 3. Operations Utility operations and supported workstations (continued)

Operations Utility operation	Workstations supported
 Change Client Remote Access Configuration (see "Change Client Remote Access Configuration" on page 16)	• NSM PTF8+ N2200 and N2800 thin clients; • N2200e Thin Client Express (Service Update 1 or later); • N2200e and N2800e (Service Update 2 or later); • N2200l Thin Client for Linux (Service Update 1 or later); • N2200 (server-booted) and N2800 Thin Client for Linux (Service Update 1 or later); • N70 thin client with Turbolinux 7
 Reset to Factory Defaults (see "Reset to Factory Defaults" on page 16)	• NSM PTF8+ N2200 and N2800 thin clients; • N2200e Thin Client Express (Service Update 1 or later); • N2200e and N2800e (Service Update 2 or later); • N2200l Thin Client for Linux (Service Update 1 or later); • N2200 (server-booted) and N2800 Thin Client for Linux (Service Update 1 or later); • N70 thin client with Turbolinux 7
 Refresh Workstation Status (see "Refresh Workstation Status" on page 18)	Valid for all workstation types
 Client SNMP Server Settings (see "Client SNMP Trap Server Settings" on page 16)	• N2200l Thin Client for Linux (Service Update 1 or later); • N2200 (server-booted) and N2800 Thin Client for Linux (Service Update 1 or later)
 Scheduling (see "Scheduling" on page 17	Valid for all workstation types
 Set Inventory Attributes (see "Set Inventory Attributes" on page 17	• N2200l Thin Client for Linux (Service Update 3 or later); • N2200 (server-booted) and N2800 Thin Client for Linux (Service Update 3 or later); • N70 thin client with Turbolinux 7

Table 3. Operations Utility operations and supported workstations (continued)

Operations Utility operation	Workstations supported
 Resource Reports (see "Resource Reports" on page 17	Valid for all workstation types
 Broadcast Message (see "Broadcast Message" on page 17	• N2200l Thin Client for Linux (Service Update 3 or later); • N2200 (server-booted) and N2800 Thin Client for Linux (Service Update 3 or later); • N70 thin client with Turbolinux 7
 Firmware Update (see "Firmware Update" on page 18	• N2200l Thin Client for Linux (Service Update 3 or later); • N2200 (server-booted) and N2800 Thin Client for Linux (Service Update 3 or later)
 Host Name Resolution (see "Host Name Resolution" on page 18	Valid for all workstation types
 Set Profile Components (see "Set Profile Components" on page 19	Valid for all groups. **Note:** Only Turbolinux 7 or later clients will use profiles.
 Setup Network Connections (see "Setup Network Connections" on page 19	N2200, N2800 and N70 thin client with Turbolinux 7

Appendix B. Understanding profile components

Profile components is a concept that allows the administrator to store configuration information for NetVista Turbolinux Workstation 7 thin clients in a variety of places and then to manage those configurations. Previously, NetVista thin clients could only save their configuration information to their boot location.

The term profile component means a ″logical set″ of configuration information. For example, desktop settings is a set of information that defines the desktop. It contains configuration information about the applications on the desktop and the look of the desktop when the client boots.

There are two types of profile components: user and workstation.

User profile components

User profile components include the following:

- Desktop settings, which contains ICA client settings, 5250 settings, and 3270 settings
- Windows Manager settings Netscape settings
- Audio settings
- Mouse settings
- Printer - user settings
- Language/environment variables

Workstation profile components

Workstation profile components include the following:

- Printer - machine settings
- Seriald settings
- Server settings - DNS and time
- Authentication server settings
- Trap server settings
- Mount point settings
- Services - Telnetd, peer boot

The required profile components are server settings and desktop settings. If these required profile components do not exist on the designated profile server, the user is prompted through a wizard-like interface to define these profile components.

Selecting the profile server

Profile components can be stored in three places:

- The client boot location (either server or local flash)
- Thin Client Manager (TCM) Operations Utility server
- Remote NFS profile server

The client defaults to storing or retrieving profile components from or to the boot location.

Boot location

For the boot location option, profile components can be saved at the system default level, machine/user default level, or file name level.

- **System default->** There is only one system default profile component per boot server. Each profile component saved replaces the previous one.
- **Machine/user default->** Save profile components at this level for the actual workstation (MAC address) or user who is saving the profile.
- **File name->** This should be used to store machine/user defaults for another user or machine (MAC address). For example, an administrator might use the file name option to set up a profile component for another client.

When the client boots, it checks for profile components in the following order:

1. Machine/user default level
2. System default level

If the client finds a machine/user profile component, it does not look for a system default. If no profile component is found, none is used; however, the profile component wizard appears to guide the user through setting up the two required profile components (server settings and desktop settings).

Storing the profile components on the boot source is the simplest way to use profile components. The ability to manage profiles is somewhat limited on the boot location option, because the components can only be set at a system-wide level or at the individual workstation/user level.

TCM Operations Utility server

Profile components can be saved to the Operations Utility. Once the profile component is saved to the Operations Utility, the administrator must assign the profile component as the default or to a group of users or workstations. When the client boots and the Operations Utility is the designated profile server, the client requests profile component information from the Operations Utility. This option is more complex than the boot location option but allows more flexibility in managing profile components for groups of workstations or users.

Remote NFS profile server

Storing client profile components on a remote NFS server allows the administrator to separate the configuration server from the boot servers. This option is similar to the boot location option but allows the configurations to be stored on a remote NFS profile server.

Search path used for Operations Utility and NFS server options

The client uses the following search path to find profile components:

1. Primary profile server
2. Secondary profile server
3. Boot server

If the primary profile server is not available, the client checks the secondary profile server. If the secondary profile server is not available, the client searches the boot server.

This path is searched at boot time for workstation profile components and then redone at login for user profile components. Therefore, it is possible to have the workstation and user profile components coming from different profile servers. Administrators that use the Operations Utility or NFS option for profile serving may want to maintain system default profiles on the boot server as backup for the other profile servers. If the administrator does not want any profile components on the boot server, they should be deleted (see Managing Profile Components).

Designating the profile server for the client

There are multiple ways to designate a profile server for the client. Most of these options require a reboot. On the reboot, the profile components are retrieved from the profile server.

1. At client boot time, designate a profile server in the boot monitor.
2. On the client, start the **Setup Utility**, click on **Profiles**, then click on **Set Profile Server**.
3. In the **Setup Utility** wizard for required profiles, click on the **Hardware Settings/Set Profile Server**.
4. From the Operations Utility, select the workstation resource, click on **Setup Network Connections**, then click on **Profile Server**.
5. The profile server can also be set up as DHCP option 214, listing the protocol\\IPServer\path.

Using profile components

The following examples could be done in many different ways. Each example illustrates a way to use profile components. These examples assume that the client server product (that is, Turbolinux Workstation 7) is installed and that TCM Operations Utility Release 2 is installed.

Using easy setup and minimal management

This example illustrates the simplest use of profile components. It shows how to store and retrieve system default profile components from the boot location, for either server-booted or flash-booted clients. It is simple to set up and provides minimal management of the profile components.

1. Boot the client. For a server-booted client, the default profile server is the boot server. For a flash-booted client, the default profile server is the local flash.
2. Save the required profile components, server settings (under workstation profile component), and desktop settings (under user profile component), to the profile server as the system default. Select the option to apply the changes now. This reboots the box with the saved profile components.

   If the client is server booted, other clients that boot from this server receive the required profile components (server settings and desktop settings) from the system level.

Additionally, individual profile components can be saved at the user or machine default level or a file name (of another user or machine) level. This profile component is then used in place of the system default.

Using moderately flexible management

This example of using profile components allows some flexibility in the management of the components. It shows how to store and retrieve system default

profile components from the Operations Utility. The profile components are then used as system defaults for all users and workstations administered by the Operations Utility. All profile components can be centrally managed from one server rather than managed from multiple boot location profile servers.

1. In the boot monitor, set the client to boot from server or from flash and set the default profile server to be the Operations Utility server.
2. Save the profile components to the Operations Utility. For example, create workstation profiles for server settings (required) and trap settings. Then create user profiles for desktop settings (required), Windows Manager settings, and mouse settings. Give the profile components a file name, descriptive name, and description.

   Note: The desktop profile component contains a flag that allows a flash-booted client to cache profiles on the local flash for backing up a profile server.
3. In the Operations Utility, click on **Tools**, then click on **Set Default Profile Components**. This operation allows the administrator to select one of each type of profile components to be the system-wide default. User or workstations resources that are not explicitly assigned a profile group pick up this set of default profile components.
4. If you use DHCP to set the profile server, this step can be skipped. Designate the Operations Utility as the profile server for all clients that are managed from the utility. See Designating the profile server for the client for an explanation of how to do this

Using very flexible management:

This example shows a complex, but very flexible use of profile components. It shows how to store and retrieve system default profile components from the Operations Utility. The profile components are then assigned to user or workstation resource groups. This example allows different profile components to be selected for different groups.

1. In the boot monitor, set the client to boot from server or from flash and set the default profile server to be the Operations Utility server. If profile components have already been stored to the Operations Utility, go to Step 3.
2. Save the profile components to the Operations Utility. For example, create workstation profiles for server settings (required) and trap settings. Then create user profiles for desktop settings (required), Windows Manager settings, and mouse settings. Give the profile components a file name, descriptive name, and description.

   Note: The desktop profile component contains a flag that allows a flash-booted client to cache profiles on the local flash for backing up a profile server.
3. To use profile components, resources (workstation and user) resource groups (workstation and user) need to exist in the Operations Utility. These resources can be manually added through the Operations Utility or automatically added via traps or profile component requests. Resource groups should be created, with individual resources added to the groups (either manually or through filters).
4. An optional step is to set up default profile components similar to the preceding example, which allows the administrator to manage some of the resources with defaults.
5. In the Operations Utility, select either user or workstation group resources and perform the **Set Profile Components** operation. This allows the administrator to assign profile components for all members of that group. This operation

shows the list of profile components that are known and which, if any, are the defaults for the Operations Utility. For example, there are two user groups, marketing and order entry. These two groups need different desktop settings profile components that match their jobs. Marketing requires a desktop settings profile component that has a Netscape browser and ICA, while order entry requires a desktop settings profile component that has ICA only.

6. Resources in the Operations Utility can be assigned to multiple groups, but only one of these groups can be their profile group. Select the resource(s) and using the right mouse click pop-up menu, choose **Select Profile Group**. Select the desired profile group from the list of groups that the resource belongs to.
7. If you use DHCP to set the profile server, this step can be skipped. Designate the Operations Utility as the profile server for all clients that will be managed from the utility. See Designating the profile server for the client for an explanation of how to do this.

Managing profile components

Profile components can be edited from the client. Load the profile from the profile server, edit it, then save it to a profile server, under the existing profile component name or a different name.

To view or delete profile components:

1. Start the Setup Utility
2. Select Management
3. Select View/Delete Profiles

Appendix C. Altering the flash image

Both IBM NetVista Thin Client Express and Thin Client for Linux have ways in which a user can alter the flash image of a workstation(s):

- Thin Client Express Service Utility
- Thin Client for Linux Turbolinux 7

Thin Client Express Service Utility

Note: This Service Utility is not available for Linux thin clients.

The Service Utility consists of the following:

- NetVista Thin Client Express image files
- Network support services that provide Network File Server (NFS) support for the client to access the image files

Note: If you install the Service Utility but not the Thin Client Manager Operations Utility, you must use the NSBoot Setup Utility or the client's Configuration Tool to rewrite the flash image. See "Installing the Operations Utility" on page 1 for more information about the TCM Operations Utility installation procedures.

The Service Utility services start automatically after the installation is complete. They are also marked to start automatically after a server reboot. If you experience server-side problems while attempting to update or recovery a thin client Express, you should verify the status of the Service Utility network support services on your server. For information on verifying the network support services status, see the NetVista Thin Client Service and Operations Utilities Readme file. This file is available on the NetVista Thin Client Utilities CD, as well as the NetVista Thin Client web site.

There are two ways to install the Service Utility:

- Installing the utility from the NetVista Thin Client Utilities CD
- Downloading the utility from the NetVista Thin Client web site

Installing the Thin Client Express Service Utility from the NetVista Thin Client Utilities CD

To install the Thin Client Express Service Utility from the NetVista Thin Client Utilities CD, insert the CD into your server's CD-ROM drive. The IBM NetVista Thin Client Utilities menu autostarts.

Note: If the Thin Client Utilities menu does not autostart, you can run the `install.bat` file from the root directory of the CD.

To install the Service Utility, click "Install NetVista Thin Client Express Service Utility."

Downloading the Thin Client Express Service Utility from the NetVista Thin Client web site

You can download this utility if you are running the Operations Utility from a Windows platform server. To download the Service Utility from the IBM Thin Client web site, you need to set up an update server. This update server must meet the following requirements:

- Reliable access to the Internet
- Runs File Transfer Protocol (FTP) or Hypertext Transfer Protocol (HTTP)
- Accessible by thin clients through a high-speed TCP/IP connection
- Sufficient space for the download files

After you have set up an update server, follow these steps to download the Service Utility from the IBM Thin Client web site:

1. From the update server, open an Internet browser and go to the following URL:
   `http://www.ibm.com/pc/support`
2. Click **NetVista**.
3. Click **NetVista thin client**.
4. Under Software Utilities, click **Download**.
5. Under Utilities, click **Thin Client Utilities**
6. From the **Downloads** box, click the item that you want to download.
   The Thin Client Express Service Utility, Thin Client Manager Operations Utility, and Readme files for each utility are available from this Internet site.

Thin Client for Turbolinux 7

IBM provides a default flash image for the N2200l thin client. Customers can create their own flash images, adding and removing files from their flash image or images. The Image Description File (IDF) Builder and Software Description File (SDF) Creator Utility is used to modify the files in flash images.

The IDF Builder and SDF Creator Utility require that a NetVista workstation be booted from a server (network booted, not flash booted). The server must have the IBM NetVista Thin Client for Turbolinux 7 (or equivalent toolkit) installed.

Downloading the Thin Client for Turbolinux 7 from the NetVista Thin Client web site

To download the Service Update 1 from the IBM Thin Client web site, you need to set up an update server. This update server must meet the following requirements:

- Reliable access to the Internet
- Runs File Transfer Protocol (FTP) or Hypertext Transfer Protocol (HTTP)
- Accessible by thin clients through a high-speed TCP/IP connection
- Sufficient space for the download files

After you have set up an update server, follow these steps to download the Service Update 1 from the IBM Thin Client web site:

1. From the update server, open an Internet browser and go to the following URL:
   `http://www.ibm.com/pc/support`
2. Click **NetVista**.
3. Click **NetVista thin client**.

4. Under Software, click **Downloads**.
5. Under Utilities, click **Thin Client Utilities**.
6. Click **Download Linux on IBM NetVista thin clients**.
7. To download the Thin Client for Linux Product complete the following:
   a. Click **Register**, complete the required fields
   b. Click **Download software and instructions**, enter in your username and password.

Once you install the Thin Client for Turbolinux 7, the IDF and SDF Creator Utility will also be installed on your server.

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Glossary of abbreviations

C

CD. Compact Disc

CD-ROM. Compact Disc-Read-Only Memory

CLI. Command Line Interface, also known as Power Scripting.

F

FTP. File Transfer Protocol

G

GUI. Graphical User Interface

H

HTTP. HyperText Transfer Protocol

I

IBM. International Business Machines

ICA. Independent Computing Architecture

IP. Internet Protocol

L

LAN. Local Area Network

M

MAC. Medium Access Control

MIB. Management Information Base

N

NFS. Network File System

NSM. Network Station Manager

NT. Network Terminal

S

SNMP. Simple Network Management Protocol

T

TCE. Thin Client Express

TCM. Thin Client Manager

TCP/IP. Transmission Control Protocol/Internet Protocol

TSE. Terminal Server Edition

U

URL. Uniform Resource Locator

V

V2R1. Version 2, Release 1

W

WOL. Wake On LAN

Index

O

P

R

S

T

U

W

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