

NetVista N2200e, Thin Client Express



A Brief Technical Overview

July 2000



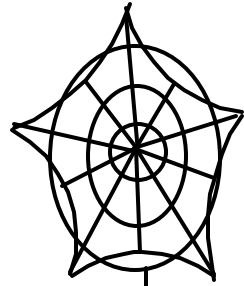
What is NetVista Express?



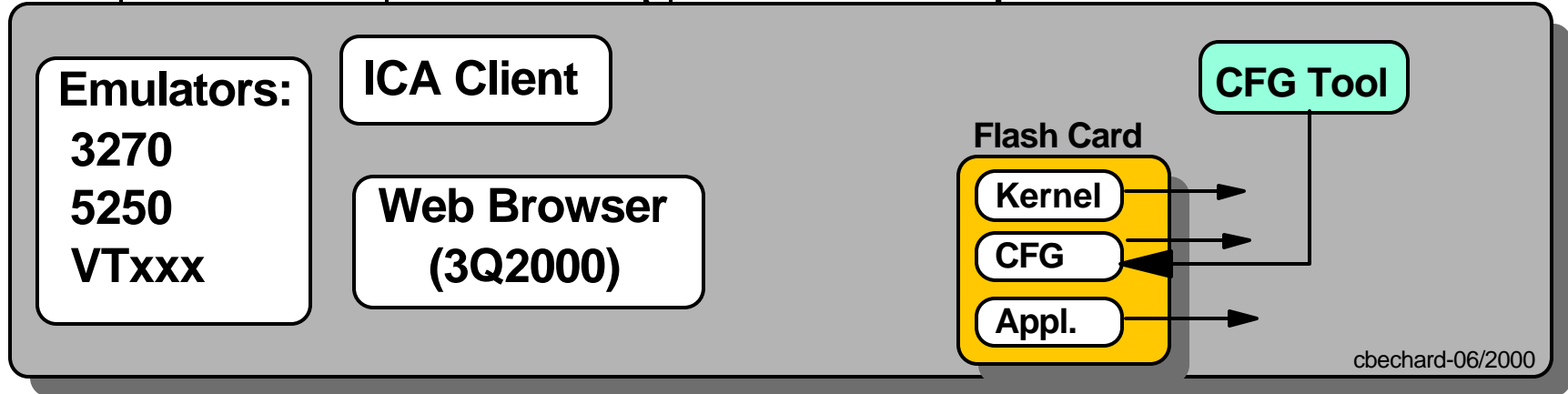
Hosts:
S/390
AS/400
Others

**Windows/Metaframe
Server**

- **A Thin Client with:**
 - Preprogrammed Flash Card (No boot server)
 - Operates In Kiosk Mode (No login)
- **With a Simplified Local Client Configuration Tool**



NetVista Express





Notes



What is NetVista Express?

It is a NetVista thin client, that operates without a boot server by getting all of its operational software from a flash card.

The configuration files that determine the desktop that the user sees are stored on the flash card and can optionally be updated using a local configuration tool. These files can also be pre-configured on a server by an administrator before being written on the flash card.

For those who are already familiar with the full thin client that is booted from a boot server, the NetVista Express can be thought of as a full thin client, configured to boot from a flash card, and which operates in kiosk mode thereby not requiring a user to logon. The major difference however is that the configuration files that determine the operational characteristics of the client can be configured locally, on the client, using a configuration tool that is a simplified version of the NSM/TCM application that normally executes on a server.

The basic applications are the same as those found normally on a thin client, such as the 3270, 5250 and Vtxxx emulators, that can access any host on the network, the Citrix Independent Computing Architecture (ICA) client that allows use of Windows applications executing on a Metaframe server and a Web Browser that is planned for 3Q2000 availability.

NetVista Express on the other hand does not offer a JVM either as part of the planned browser or as a stand-alone JVM.



Why the N2200e Thin Client Express?



- Easy to set up
 - ▶ Thin Client Manager (TCM) server technology not required
 - ▶ Flash based boot
 - ▶ Peer boot - boots many thin clients that do not have flash cards
 - ▶ Minutes from opening box until up and running applications
- Simple to manage
 - ▶ No TCM/NSM required, very simple local configuration tool provided on client
 - ▶ No-charge Utilities available for flash and remote operation management (Express Service Utility and TCM Operations Utility)
 - ▶ Update Thin Client Express in remote locations
- Room to grow
 - ▶ Rapid entry into NetVista thin clients
 - ▶ Seamless, no charge transition to full server-based environment
 - ▶ Applications included are functionally equivalent to those found in TCM V2R1 PTF6
 - ▶ Browser and dialer support in 3Q 2000 (via PTF and new from factory)



Notes



The main driving factors for the Thin Client Express were primarily the ease of installation and setup, the simplicity of management (no requirement for a server-based TCM) while maintaining the ability to grow.

It is very easy to set up, right out of the box, because there are only a few steps required to make the box operational. It does not require a set of configuration files to be managed by TCM and downloaded from the network. All it requires is already on the flash card, except for the very basic initial network information required to connect into the network, which is configured via a Setup Wizard the first time the unit is powered on.

It is very simple to manage because of the presence of a local configuration tool as well as a set of utilities for flash and remote operations.

Finally, there is ample room to grow as the unit can very easily transition to a full server-based environment. The switch to a server-based environment is in fact so simple that it can be done remotely via the TCM Operations Utility.

Note that browser and dialer support is expected in 3Q00 and the flash card has already a sufficient capacity to accommodate these additional components.



How Is Thin Client Express Positioned?

Extend HW investment, SW transition options



■ IBM NetVista N2200

- ▶ X86 legacy-free system
- ▶ Supports multiple software environments

■ N2200 Zero Footprint brackets

- ▶ For space savings
- ▶ Brackets attach N2200 to IBM T55 flat panel screen



■ N2200w WBT Standard 1.5

- ▶ For those who want Microsoft thin client software
- ▶ Packaged solution
- ▶ Local WBT IE 4 (3Q)
- ▶ Local emulators
- ▶ Transition to TCM, Linux

- **N2200e
Thin Client Express**
 - ▶ **For those who want IBM thin client SW with rapid setup, deployment**
 - ▶ **Packaged solution**
 - ▶ **Local Netscape 4.5 (3Q)**
 - ▶ **Local emulators**
 - ▶ **Transition to TCM, Linux**

■ N2200l Thin Client for Linux

- ▶ For those who want open source, SW downloads
- ▶ IBM toolkit, instructions on Web
- ▶ IBM moderates Web discussion group
- ▶ Transition to / from TCM

■ N2200 TCM V2R1

- ▶ For those who want full function clients with full server management SW
- ▶ Local Netscape 4.5
- ▶ Local emulators
- ▶ Local JVM
- ▶ Transition to Linux



Notes



This chart illustrates where the N2200e Thin Client Express fits within the range of the NetVista N2200 offerings.

Each offering is targeted to satisfy a specific set of needs, while maintaining the flexibility to transition to other uses, thereby protecting and extending the hardware investment.

Note that the N2200w and N2200e are packaged solutions, in the form of code being supplied on a flash card with the unit, in order to make it easier and simplify an implementation.

The N2200w is oriented mainly to an environment where access to applications on a Windows Terminal Server is the primary purpose, with local emulators also being available.

The N2200e on the other hand is a simplified full TCM V2R1 environment oriented to rapid and easy deployment.

The N2200i is meant for those who want to benefit from an open source environment and the availability of software download that this provides.

The N2200 with full TCM support is geared to a full server management base with the capability for running local Java based applications.



The N2200e at a glance!



Model/Type	8363-CUS
Memory	32MB => 288MB
Applications	Citrix ICA 1.8 5250/3270/VTxxx Emulators Netscape Navigator 4.5 (3Q2000) Can transition to TCM V2R1 or Linux
Server Reqt's	None for local boot Same as TCM V2R1 for server boot Normal application servers for emulators, ICA and browser
Flash Memory	32MB CompactFlash card
Connectivity	Ethernet 10/100Mb
I/O Ports	Two USB, one used for keyboard/mouse
Video Support	2MB RAM, VGA, SVGA, XVGA up to 1280x1040 at 256K colors
Input Devices	PC Style USB Keyboard and mouse
Audio Support	16-bit audio with stereo jack and mono input jack
Power	16 watts
Warranty	Three years



Notes



For those who need a few speeds and feeds, here is a summary of some of the specifications of the N2200e. The hardware is identical to the N2200 used for TCM V2R1 except that it comes with a 32MB CompactFlash card pre-loaded with the required software and is available only in an Ethernet configuration.



Available Now . . . Built for the Future

IBM NetVista N2200e Thin Client Express



- Proven thin client hardware - N2200 (N2800 3Q)
 - ▶ 32 MB compact flash - room for browser
 - ▶ TCM Server software not required
 - ▶ USB Keyboard and mouse
 - ▶ 3 year warranty
 - ▶ Ethernet connectivity
- Express client software
 - ▶ ICA 3.0++ for Windows access
 - ▶ Terminal emulators
 - 3270, 5250, VTxxx
 - ▶ Netscape 4.5 browser (3Q)
- Systems management
- Transition options
 - ▶ Entry to Thin Client Manager
 - ▶ Thin Client for Linux



Notes



Some of the key highlights are that the N2200 hardware is a solid proven base, that is used in the other environments as well. The N2800 is also planned to be available in 3Q00. The 32MB CompactFlash card has the room to accommodate the Netscape 4.5 browser planned for 3Q00.

The applications that can be used are:

- An ICA client for access to a MetaFrame server
- Emulators (3270, 5250 and VTxxx)
- A browser to be available in 3Q00

The N2200e can be fully controlled and managed remotely via the TCM Operations Utility which uses an SNMP agent on the unit to perform remote control operations.

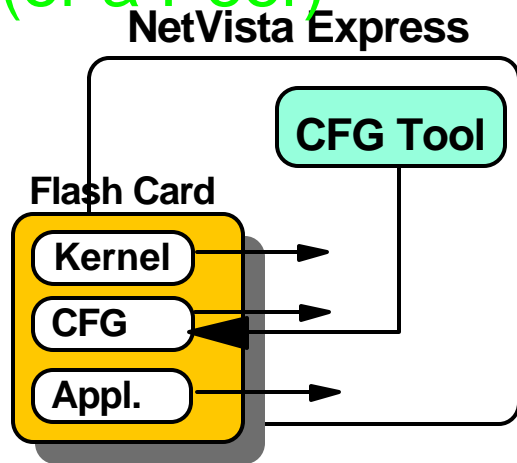
Transition to TCM V2R1 can be accomplished with minimal changes.



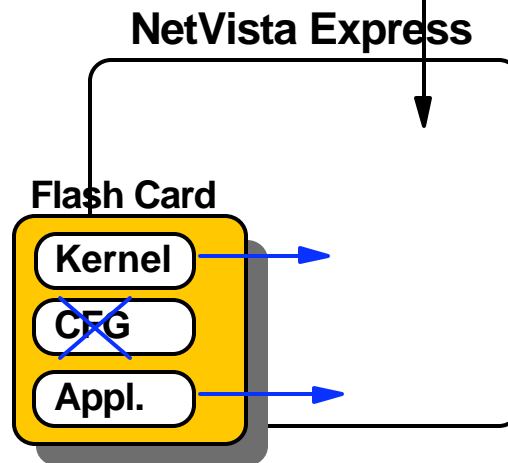
Three Ways to Boot NetVista Express



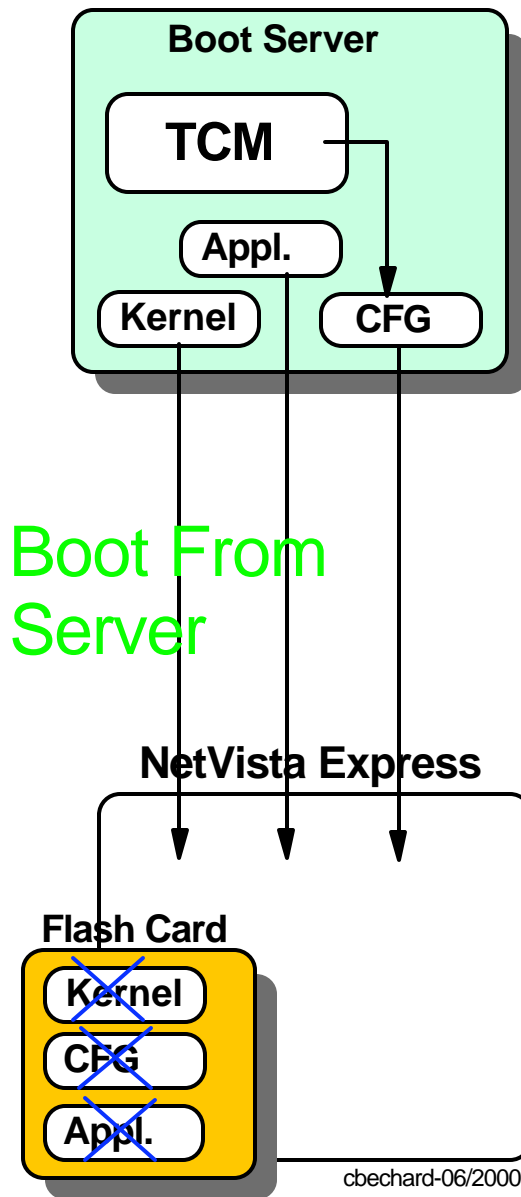
Boot From Flash
(or a Peer)



Authenticate from Server



Boot From Server





Notes



NetVista Express is designed to operate as a flash card based thin client, with the objective of being easy to use and operate without the need for a boot server. However, the NetVista Express is also capable of operating in other modes to suit the needs of the user and to provide flexibility and transition capabilities.

BOOT FROM FLASH

This mode is the normal NetVista Express mode. On power on, the station loads its kernel from the flash card, then loads its configuration files also from the flash card as well as any application that the user wishes to start. There is no logon required nor any files to be downloaded from a server on the network.

Customization of the unit is accomplished via a local client-based configuration tool that manages configuration files on the flash card. This tool performs a subset of the configuration tasks that would normally be performed via a server-based NSM or TCM application.

Note: A station with a flash card can also be used as a "master" to allow peer units, that do not have their own flash card, to boot from the flash card on the master unit.

AUTHENTICATE FROM SERVER

In cases where we still want to load the kernel from the flash card, while also taking advantage of the flexibility provided by the centralized management of configuration files, the NetVista Express can be operated in the "Authenticate from server" mode. In that case, after the kernel has been loaded from the flash card, a login panel is presented to the user, where a user name and password is entered, and the configuration files for that user are then downloaded from a boot server.

BOOT FROM SERVER

The unit can also be operated totally from the network in the Boot From Server mode, where all files are downloaded from a boot server. In that mode, the flash card is essentially not used and the unit is operating in full V2R1 mode.



Three Ways to Use NetVista Express



- **Stand Alone Mode**

- For small deployments, or where each client requires unique customization
- No server is involved
- Client configures desktop via local cfg tool

- **Server-administered configurations**

- For large deployments, or where Express clients require group-specific desktops
- Managed via the server-based TCM Manager Operations Utility using SNMP Management capabilities
- One "master" client configures multiple desktops to be used by other Express clients

- **Peer Boot clients without a server**

- For deployments where peer boot clients with no flash card use the Express client software, configuration, to spread cost of Express client across multiple peers without flash cards (no server involved)
- "Master" Express client configures a desktop to be used by other peer boot clients
- The peer units share all the characteristics of the Master client (Preferences, printer config, language, mouse configuration)



Notes



We just saw three ways of booting the unit, but let's discuss now the three typical ways of using the Express Unit.

- **Stand alone mode** - This is the primary use of the Thin Client Express, in environments characterized by a small deployment and where each client can be uniquely customized. There are no boot server involved and the client can configure its own desktop through an easy to use graphical interface.
- **Server administered configurations** - This scenario is typical of large deployments where there is a need to configure units based on groups. Using the TCM Operations Utility on a server, one unit of a particular group can be customized, and then its configuration files can be pulled to the server and pushed back down to multiple other units, effectively replicating the configuration of one station to many others.
- **Peer Boot clients without a server** - This is for environments where we can make use of the peer boot facility of the Thin Client Express. In this case, other units without a flash card can boot from the flash card located on a "master" Express unit. The units without a flash card do not require a server as they get all their operational code and configuration from flash card located on the master unit. Note that in this case, the peer units are absolutely identical to the master unit, since the exact same configuration files are used for all units, and these peer units cannot be customized on an individual basis.



Easy to Set Up and Configure



- **Easy to Set Up and Configure - Three Simple Steps**

1. Configure TCP/IP network data, display resolution, and keyboard language
2. Specify one application, or configure a set of applications on a full desktop with launch bar
3. Begin using the workstation

- **Configuration Tool**

- Preloaded on the Thin Client Express
- Offers rapid initial configuration
- Customize Desktop appearance
 - Single application kiosk configuration
 - Complete desktop, launch bar, and auto start options
- Software update - Request client flash update from remote update server



Notes



The Express unit is easy to set up because there are only three required steps to become operational, and they are performed via the Setup Wizard:

- Specify the basic IP network data (which can be as simple as selecting DHCP), choose a display resolution (default can be selected) and keyboard language (default can also be chosen).
- Identify at least one application to be started on power up
- Reboot

For the selection on an initial application, or for further configuration once the unit is operational, the Express unit includes a local configuration tool that is preloaded on the flash card and provides the user with a very easy to use graphical interface.

This configuration tool is used mainly to allow customization of the desktop and to request software updates from a remote server when required.



Functional Comparison - DRAFT



Function	TCM V2R1	Express	WBT-Generic	IBM WBT
Client functions				
ICA Remote Application Manager	x	x	Less Function	Less Function
5250, 3270, VTxxx Emulation	x	x	Less Function	Less Function
Netscape 4.5	x	3Q00 No Java		
Client Configuration Tool	x (PTF 6)	x	x	x
Management				
Easy field update	x	x		
Efficient cloning technology	Not Applicable	x		
WAN Friendly Update	x	x		
Other OS Support				
Kiosk Mode	x	x		
Full Desktop Kiosk Mode		x		
Windowed Environment	x	x		
Convert to other OS	Not Applicable	Linux	No	No
Convert to V2R1 boot	Not Applicable	Yes	No	Yes



Notes



How does the Express Unit then compare with other thin clients of the same family?

This chart provides some of the main characteristics for the N2200 (TCM V2R1 server-based) unit, a generic Windows Based Terminal and the IBM version of the WBT (the N2200w).

The main points to observe are that the main difference between the full TCM V2R1 and Express are that the Express browser to be made available in 3Q00 does not have Java support but it can be transitioned to either server-based environment or Linux.

The Express Unit is particularly strong as well in the easiness with which it can be cloned and operated from a remote central site via the TCM Operations Utility.

The WBT does not have a local browser because it is expected to use a browser on the terminal server via either a Microsoft Remote Desktop Protocol (RDP) or ICA session.



Thin Client Utilities

Simple to manage



- Two "as-is," no-charge utilities available
 - ▶ Thin Client Express Service Utility (5648-D83)
 - Contains latest complete client flash image
 - Client has code to pull and reflash from these files
 - ▶ Thin Client Manager Operations Utility (5648-D84)
 - Set of tools for remote operations for N2200e, N2200, and N2800
 - N2200, N2200e, N2800: client lockdown, wake on LAN, remote reboot
 - N2200e: clone configuration, force flash update, force authentication to server
- Available as Web download or on single orderable CD
 - ▶ www.ibm.com/nc, select software for V2R1
 - ▶ NetVista Thin Client Utilities CD -- GEMS order number 11K7686
- PC Server or desktop with
 - ▶ Microsoft Windows NT 4.0 or Windows NT 4.0 TSE
 - ▶ Windows 2000 (Beta)
- Do not need to be available on network during normal operation
 - ▶ No need for utilities to be permanently resident on network server
 - ▶ Can be loaded on laptop and attached to network during updates
- English only



Notes



There are two utilities available to manage the Thin Client Express units.

Thin Client Express Utility:

The first one, called the Thin Client Express Service Utility, is used to update the code on the flash card of a Thin Client Express. It is basically an NFS-based utility, residing on a Windows NT server, that has BOM (Bill-of-Material) files that lists the components that need to go on the flash card.

The thin client can pull code from this utility in order to reflash the card or to update the contents of the card.

Thin Client Manager Operations Utility:

The second utility is called the Thin Client Manager Operations Utility and is basically a tool to remotely trigger actions on a remote client, such as:

- o Wake on LAN - Cause a remote client to power up and come alive
- o Shutdown/Reboot - Cause a remote client to power down or Reboot
- o Remotely change the NVRAM configuration so that the unit, on the next boot, will either boot from flash, boot from a server, or boot from flash but authenticate and get its configuration from a server.
- o Start or Stop the Telnet and FTP Daemons on the client
- o Flash Update - Cause a remote unit to pull a flash update from a server
- o Backup and Restore configuration files by causing an FTP of these files to/from a server
- o Change the remote access authorization passwords on a client
- o Grant or Deny access to the configuration tool on the client (i.e. lock up the config tool)
- o Reset the remote unit to factory defaults

This utility can also be used to perform some limited functions on other thin clients.

These utilities are available for download from the Web and are very easy to install and operate.



Simple to Manage

NetVista

Update Thin Client Express in customer locations

- Client Side Pull (Thin Client Express Service Utility)
 - ▶ Latest image available on web or CD
 - ▶ Download update service to file on Windows NT
 - ▶ Install on Windows NT workstation or server
 - ▶ On client, select configuration tool's software update, request flash update

- OR -

- Management Service Push (Thin Client Manager Operations Utility)
 - ▶ Install Java based management tool from web or CD on Windows NT workstation or server
 - ▶ Windows NT workstation or server initiates client pull

- OR -

- Update via peer
 - ▶ Assuming Boot Monitor intact
 - ▶ Configure peer to reset flash from master



Notes



There are three easy ways to update the content of the flash image on a remote client:

- The client can pull an update simply by requesting it from the configuration tool on the client. This causes the client to contact the Thin Client Express Service Utility on a Windows NT server, to compare its BOM file with the BOM file on the server, and to download the updates.
- One or more clients can be remotely triggered to request an update using the TCM Operations Utility
- A peer unit can be configured to reset its flash card from the master unit

In all cases, the update operation is very simple and straightforward.

Note: There is also a fourth way which would be to do a complete flash recovery by rewriting the flash card completely. This would be done when there is a need to either burn a new blank flash card or to recover a corrupted one. In this case, one would configure NSBOOT to load a version of the kernel from the Express Service Utility that initially display a choice of BOM files from which to reflash the card. The code is downloaded, written to flash and the unit rebooted.



Configuration Tool

The screenshot displays the Configuration Tool interface. On the left, a vertical sidebar contains two icons: 'Advanced Diagnostics' (wrench icon) and 'Configure Tool' (laptop icon). An arrow points from the 'Configure Tool' icon to the main window. The main window, titled 'Configuration Tool', features a 'Configuration Tool Access' section with three buttons: 'Configure Workstation', 'View Network Information', and 'Software Update'. An arrow points from the 'Configure Workstation' button to a 'Password' dialog box. The dialog box contains the text 'Enter the password for this workstation.' and 'Current password:' followed by a text input field containing the character 'T'. At the bottom of the main window, there are 'Exit' and 'Help' buttons. A computer monitor, keyboard, and mouse are shown in the lower right area of the main window.



Notes



The larger panel on this chart is the main configuration tool panel on the NetVista Thin Client Express.

It is accessed either through an icon on the launch bar entitled "Configure Tool" or by the CTL-Alt-Shift key sequence, assuming that the administrator has allowed access to the configuration tool.

Of the three selections available on the main panel, the first and the last may require a password if an administrator password has been configured for the station.

- Configure Workstation is the main task that allows the settings of all the parameters that describe how the workstation operates
- View Network Information is a single panel displaying the network data for this station
- Software Update is use to configure all the parameters related to either updating the software on the station or allowing remote access to the station.



Configure Workstation

NetVista

The screenshot displays the 'Configuration Tool' window. At the top, the title bar reads 'Configuration Tool'. Below the title bar, the 'Workstation Mode:' is set to 'Applications with Launch Bar'. On the left side, there are two panels: 'Main Tasks' and 'Subtasks'. The 'Main Tasks' panel lists 'Hardware', 'Preferences', 'Desktop', 'Environment', and 'Administration', with 'Hardware' selected. The 'Subtasks' panel lists 'Workstations' and 'Printers'. The main content area contains instructions: 'To change the Workstation Mode: Click on the current Workstation Mode above and select a different Mode.' followed by two bullet points: '- The single application Workstation Modes only support a single full screen application.' and '- The last two Workstation Modes support one or more applications (with or without a launch bar).'. Below this, it says 'To change a configuration option: Click on a main task, click on a subtask and change the desired configuration option.' A dropdown menu is open, showing options: 'Single ICA Client', 'Single ICA Remote Application Manager', 'Single 3270 Emulator', 'Single 5250 Emulator', 'Single VT Emulator', 'Startup Applications without Launch Bar', and 'Applications with Launch Bar'. At the bottom of the window are buttons for 'Save', 'Back', 'Exit', and 'Help'. An inset window on the left shows the 'Configuration Tool Actions' menu with 'Configure Workstation' highlighted. Arrows indicate the flow from the menu to the main window and from the dropdown menu to the 'Workstation Mode' field.



Notes



After selecting Configure Workstation, and entering a password (if a password has been enabled), the panel displayed here is the first configuration panel.

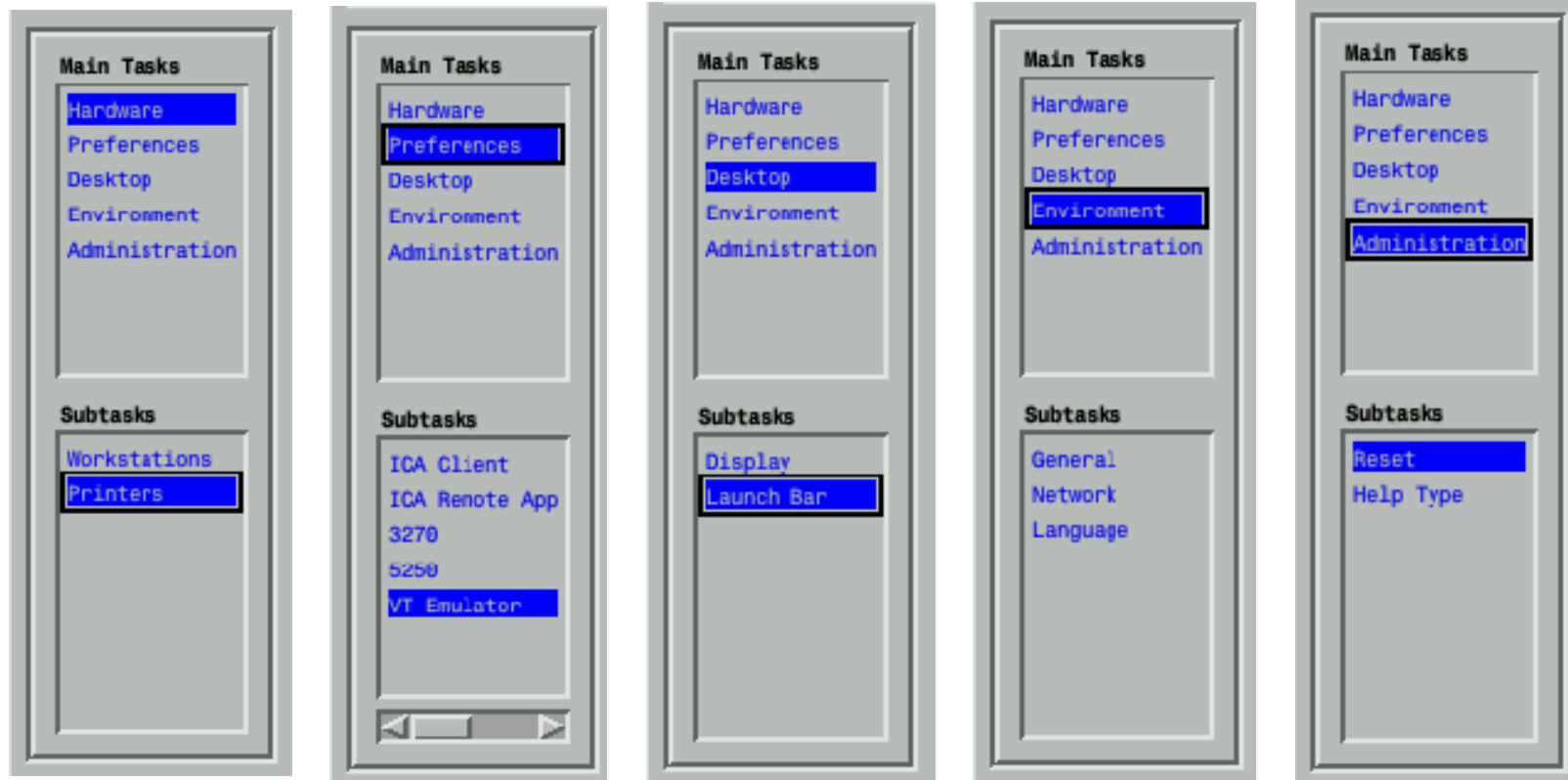
From this panel, there are three primary choices:

- The Workstation mode determines the main operating mode, and the seven choices are displayed here. Notice that the first five choices are all a single application that would come up automatically when the station starts, where as the last two choices are multiple applications, with or without a launch bar.
- Main Tasks are available to provide categories of parameters
- Once a main task is selected, a set of subtasks is displayed for selection. In this example, when selecting hardware, one can configure either workstation specific parameters such as a left handed mouse for example, or printer specific information.

These are all very simple and user friendly configuration tasks.



Main Tasks and Subtasks





Notes



In an effort to provide a general idea of all the subtasks that are available, this composite picture shows the subtasks for each of the five main tasks.

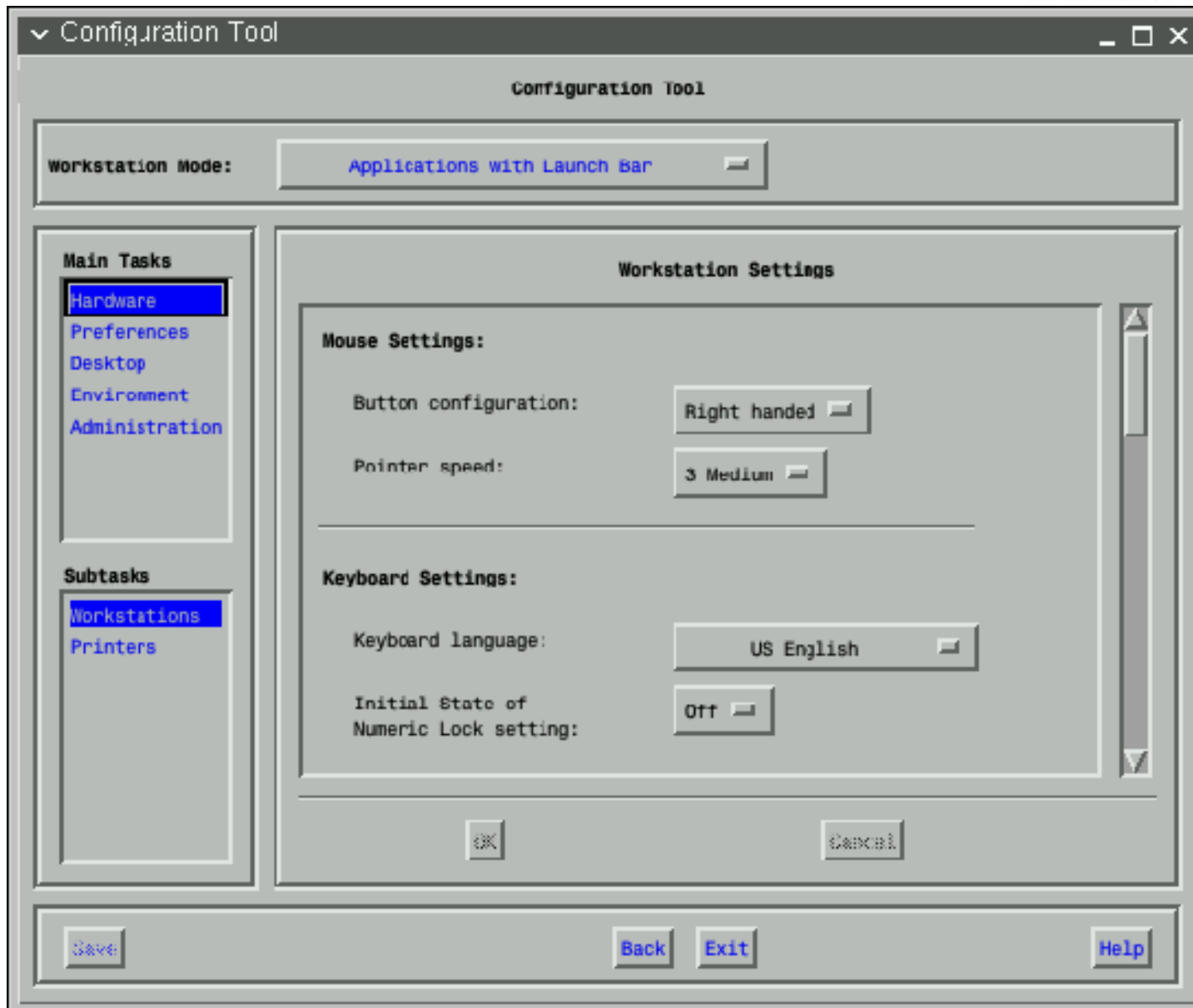
For those who may already be familiar with the Thin Client Manager application (TCM/NSM), you will no doubt notice that these are a subset of what is normally available for configuration via the full server-based TCM/NSM V2R1 configuration application.

In fact, the configuration file produced by this local configuration tool is similar to the file(s) produced by the full server-based TCM/NSM application.

The tool is designed to be simple and to address most typical configuration needs and can therefore be considered as a subset of NSM running locally on the Express unit.



Sample Workstations Details





Notes

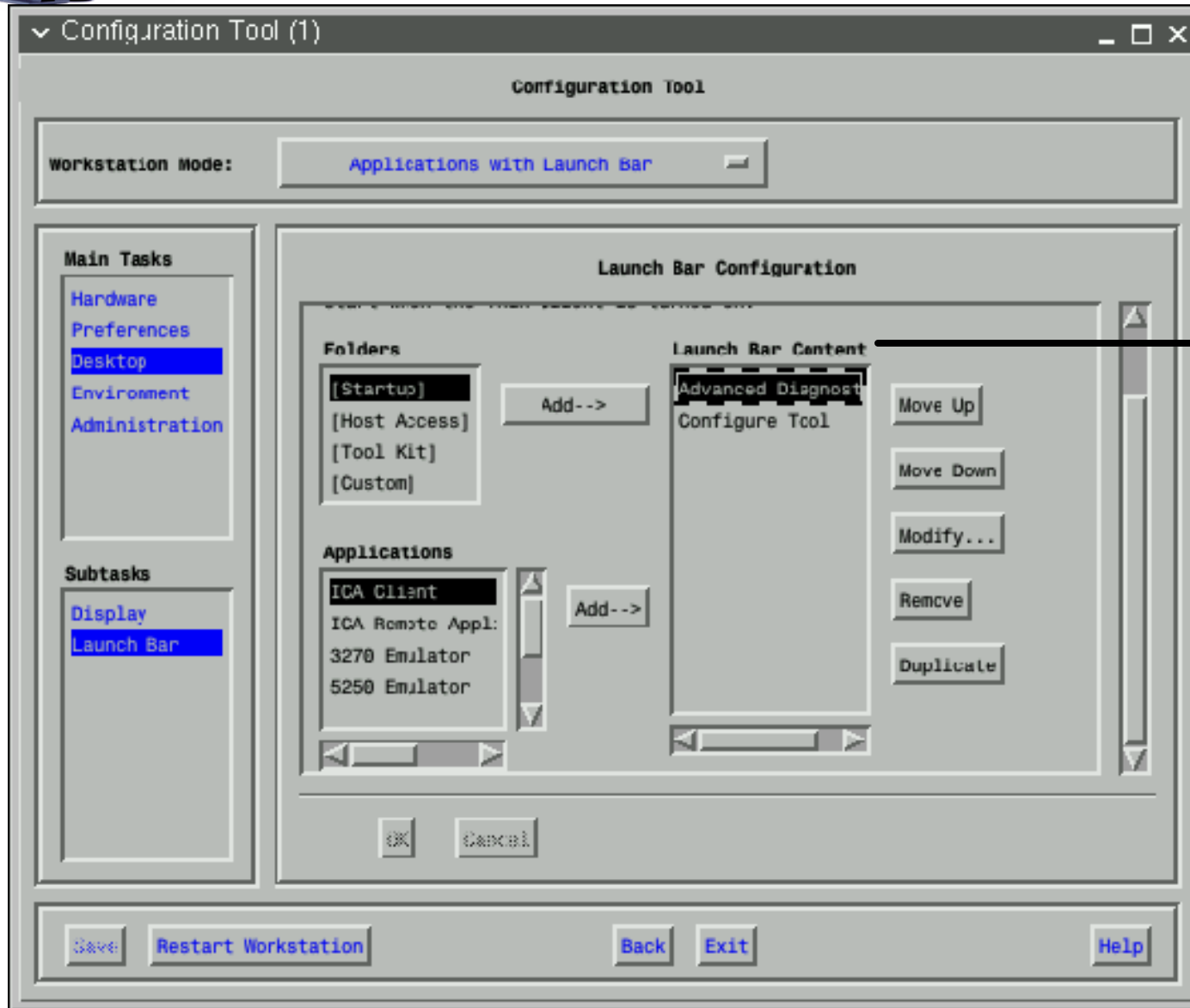


If you have not yet had a chance to use the configuration tool and to browse the different menus, here is an example of the Hardware/Workstations subtask panel, showing the mouse and keyboard settings part of the panel.

Again, notice the similarity with the full TCM/NSM server-based tool.



Desktop Launch Bar





Notes



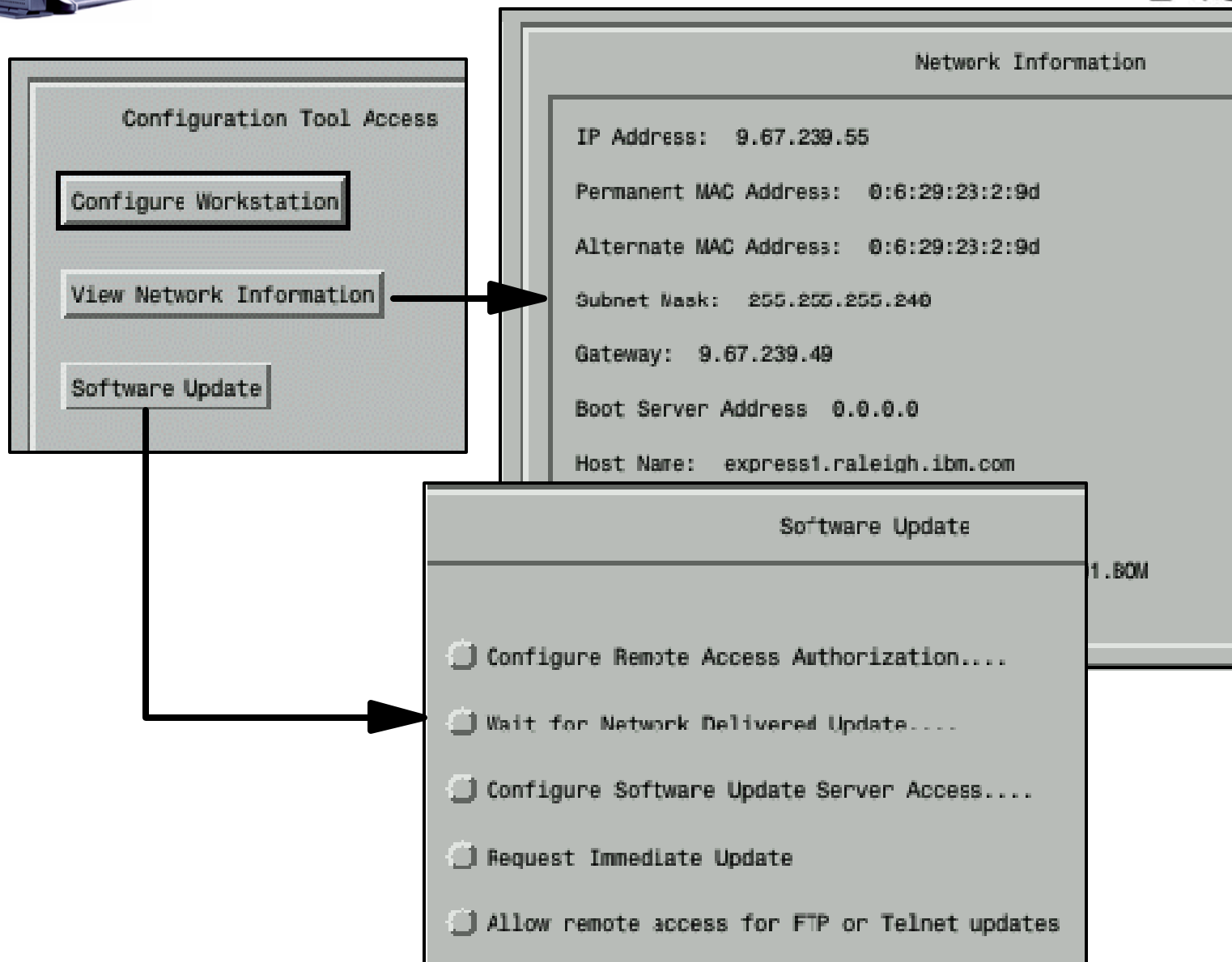
It is certainly not necessary to cover all the configuration panels, as most are pretty simple to understand, but here is the most important one in the case where the station is configured with a launch bar, because this determines the appearance of the launch bar.

On the right, the Launch Bar content window displays the current content of the launch bar. Folders and applications are added to this window by selecting them from the left hand windows and clicking on the Add--> button.

Once on the launch bar, applications can be moved up and down relative to one another and they can be modified, duplicated and also removed.



Network Info and Software Update





Notes



This particular page shows the information obtained by using the **View Network Information** button on the main panel, which is a single panel.

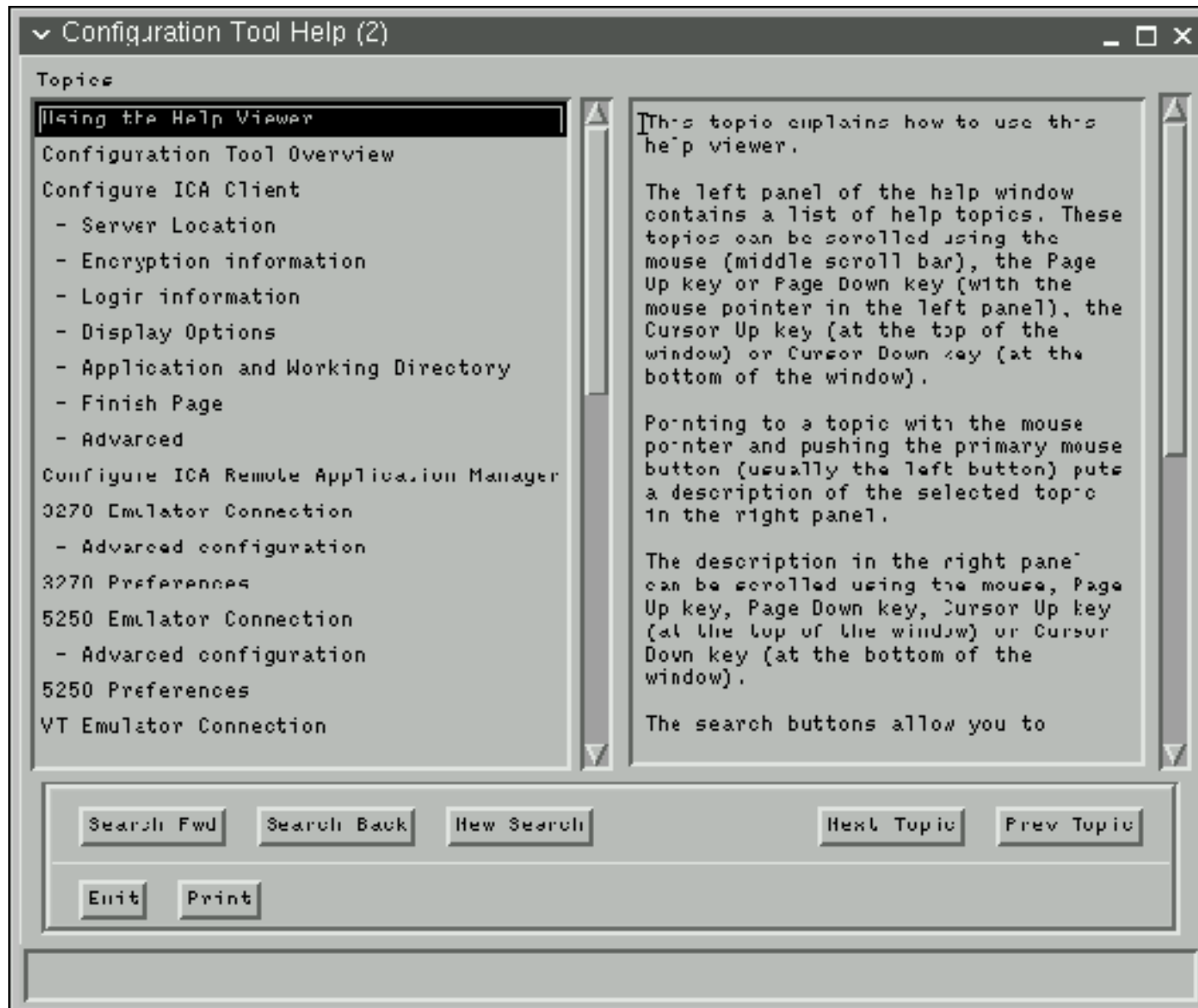
No password is required for the user to access this panel and it may be used, in problem determination situations, to quickly verify some of the most important parameters that relate to networking.

We have also displayed here the tasks list obtained by clicking on the **Software Update** button, after entering the password, if required.

All of these tasks relate to remotely accessing the station from the TCM Operations Utility and to performing updates to the software residing on the flash card. We discuss the details on these tasks in a separate presentations where we discuss the NetVista Utilities such as the Express Service Utility and the TCM Operations Utility.



Help





Notes



Finally, even though the configuration tool is fairly simple, there are still a fair number of parameters to configure and not everyone may be familiar with their usual settings and their use.

At any time, online help is always available by a click on the help button.

We have illustrated here the main Help panel displayed when the user clicks on the Help button.

The help facility can be configured to be context sensitive, meaning that the information displayed will be based on the task that was being used at the time the help button was pushed, or general help showing all topics and letting the user choose the appropriate topic.



Configuration Files



- **System Configuration Files**

- Shipped.nsm (in /termbase/profiles)
 - Base configuration parameters - Not modified by the cfg tool
- Update.conf (in /termbase/profiles)
 - URL of the update server
- gen_cp.nsm (in userbase/profiles)
 - Used only for the first initial configuration (out-of-the-box or after reset to factory settings)
 - Start-up config designed to bring up the configuration wizard
- cp.nsm (in /userbase/profiles)
 - Created when the configuration tool is used for the first time
 - Main operational configuration file

- **Application created configuration files**

- Contains ICA and Emulator application configuration and preferences (for example, emulator color preferences)
- in /userbase/home/kiosk/.ICAClient/*
- in /userbase/nsmshared/kiosk/*



Notes



If you are an administrator, you will no doubt be interested in knowing about the main configuration files types and location. There are two types of configuration files:

- **System Configuration Files** - There are four of these
 - The **shipped.nsm**, located in /termbase/profiles, contains base configuration parameters that are never modified by the configuration tool.
 - **update.conf**, also located in /termbase/profiles, contains the URL of the update server to contact when requesting a flash update. The data in this file is supplied either via the configuration tool or remotely via the TCM Operations Utility.
 - **gen_cp.nsm**, located in userbase/profiles, is used only for the first initial configuration when configuring the unit for the first time or after a reset to factory settings. This configuration actually causes the Setup Wizard to start and to create the next file based on parameters supplied by the user.
 - **cp.nsm**, also located in /userbase/profiles is the main operational configuration file. It is initially created by the Setup Wizard and contains all the parameters configured via the configuration tool.
- **Application Created Configuration Files**
 - There are a variety of these files that contain ICA and Emulator application configuration and preferences (for example, emulator color preferences). The ICA data is located in /userbase/home/kiosk/.ICAClient/*, and all the other files are located in /userbase/nsmshared/kiosk/*



Additional Information



- **IBM NetVista Express Product Publication**

- NetVista N2200e Thin Client Express Reference - June 2000 SA23-2803-00
 - ▶ Available from <http://www.ibm.com/nc/pubs>

- **Other presentations related to NetVista Express**

- IBM NetVista TCM Operations Utility
- IBM NetVista Express Service Utility
- These can be found on the web support site below

- **Support Site**

- <http://www.pc.ibm.com/support>



Notes



The product publication for the Express unit can be obtained from the www.ibm.com/nc/pubs site.

There are also two other related presentations on the NetVista Utilities that can be found on the support site www.pc.ibm.com. These provide additional details on how to remotely manager Express units and how to update the software on an Express Unit.