8 Adding Thin Client Hardware

8.1 The Boot Process

There are two methods that an ACP Enabled thin client can use to boot. The standard method is to connect to a ThinManager Server and download the firmware and its configuration across the network. This allows for an easy update of the firmware and ensures that all the terminals share the same firmware. Embedded ThinManager Ready thin clients have the firmware embedded in them on a compact flash or disk-on-chip and boot locally then connect to a ThinManager Server to download its configuration. See Firmware Update (Disk On Chip / Compact Flash) Update Module for details.

A ThinManager Ready thin client goes through a number of steps from the initial power on to the complete connection to a terminal server. Understanding this process will aid in terminal configuration and troubleshooting.

The steps are:

1. **POST:** Once a ThinManager Ready thin client is turned on it begins the **Power On Self-Test** to examine the hardware and to test the memory.

2. **IP Address Assignment:** The terminal needs an IP address to connect to the network. By default, it receives an IP Address from a DHCP server, but this can be changed to use an assigned static IP. See IP Address Assignment for details.

3. **ThinManager Server Connection:** After receiving an IP address the terminal will connect to the ThinManager Server. This is the Boot Server Host as defined in the DHCP scope Option 066 or the Primary ThinManager Server defined in the static IP address configuration.

4. **Firmware Loading:** Next the terminal will download the firmware from the ThinManager Server.

5. **Terminal Configuration Download:** Established terminals will receive their configuration and proceed. New terminals will need to be defined on the ThinManager Server, either through the Terminal Configuration Wizard or the Create New Terminal method.

6. **ACP ThinManager Logo Screen:** After the terminal receives its configuration, it will display an ACP splash screen with the ThinManager logo.

7. **Client Communication Connection:** Next the terminal will launch its Client Communication protocol.

8. **Terminal Server Connection:** The thin client will connect to the terminal server(s) that it is assigned to in its configuration.

9. **Windows Login:** Next the terminal will display the Windows Login dialog box, prompting for a valid username and password. If these have been entered into the username and password fields on the Terminal Configuration Wizard of ThinManager, the terminal will login automatically and display the Windows desktop or a defined initial program.

Note: Windows 2000 prevents auto-login with RDP by default. To allow auto-login see RDP-tcp Login Settings for details.

Windows Session: The terminal logs onto a session on terminal server. The terminal will pass mouse clicks and keystrokes to the session on the terminal server. The terminal server will process the data and send the graphics back to the terminal for display, giving a full Windows experience to the user.

8.2 IP Address Assignment

ThinManager Ready thin clients are set by default to automatically receive an IP address from a DHCP server. Most ThinManager Ready thin clients may use a manually assigned Static IP address instead.

Note: The ThinAdapter and ThinAdapter Plus require DHCP.

8.2.1 DHCP

ThinManager Ready thin clients are set to use **DHCP** (Dynamic Host Configuration Protocol) by default. The DHCP Server needs two options configured for ThinManager Ready thin clients.
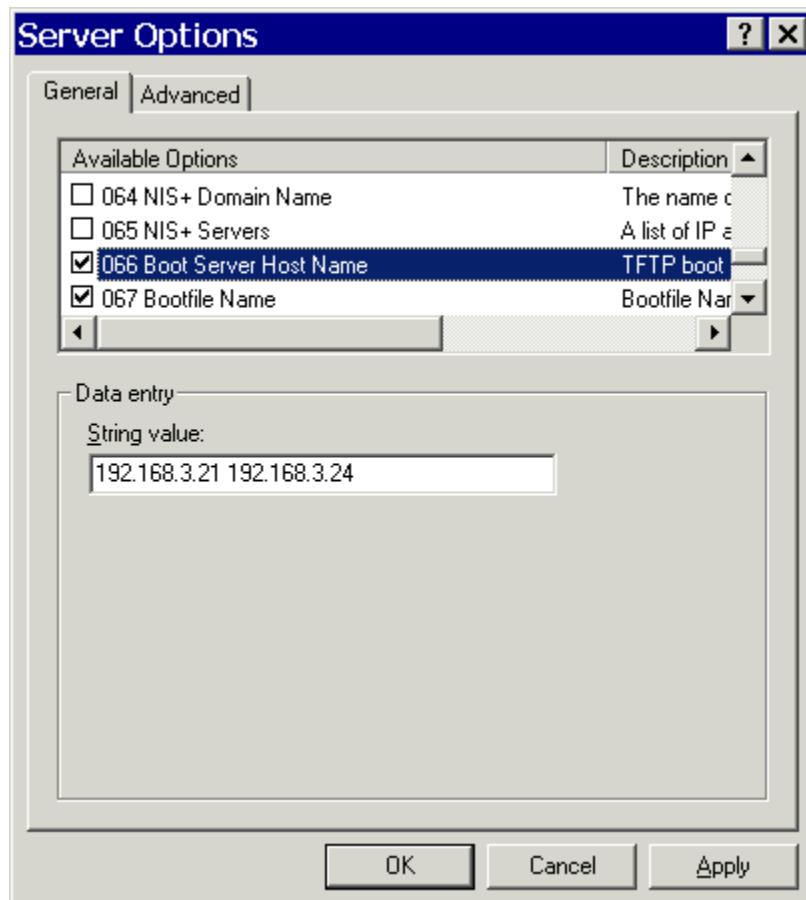
DHCP Options

Option 066 - Boot Server Host Name must be set to the IP address of the ThinManager Server. If redundant ThinManager Servers are being used, the IP addresses of multiple ThinManager Servers can be entered, separated with a space.

Option 067 - Bootfile Name must be set to `firmware.acp`.

Details are at DHCP Server Setup for details.

ThinManager Ready thin clients use DHCP (Dynamic Host Configuration Protocol) by default. If they have been set to use a static IP they can be reset to DHCP from static IP by pressing **any key** when prompted during the boot sequence to open the IP Configuration Menu.


```
ACP Network Boot Loader v4.5
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IP Configuration Menu

(A) Terminal IP Address 192.168.3.115
(B) Primary ThinManager Server IP Address = 192.168.3.11
(C) Secondary ThinManager Server IP Address = 192.168.3.12
(D) Router IP Address = 0.0.0.0
(E) Subnet Mask = 255.255.255.0
(F) Password Status : Disabled
(H) Help

(Q) Abort Changes and Exit
(S) Save Changes and Exit
Enter new Terminal IP Address
Enter 'D' for DHCP or Static IP as X.X.X.X : D
```

IP Configuration Menu - DHCP

Press the *A* key to allow a change to DHCP and enter *D* key to set the configuration to DHCP. Press the *Enter* key to return to main menu.

Press the **S** key to save the configuration and continue with the boot process.


```
ACP Network Boot Loader v4.5
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Status:Connecting to ThinManager Server 192.168.3.11

Terminal IP Information

IP Method : DHCP
Terminal IP : 192.168.3.173
Primary ThinManager Server : 192.168.3.11
SecondaryThinManager Server : 192.168.3.12
Router : 192.168.3.36

Download Progress Meter
```
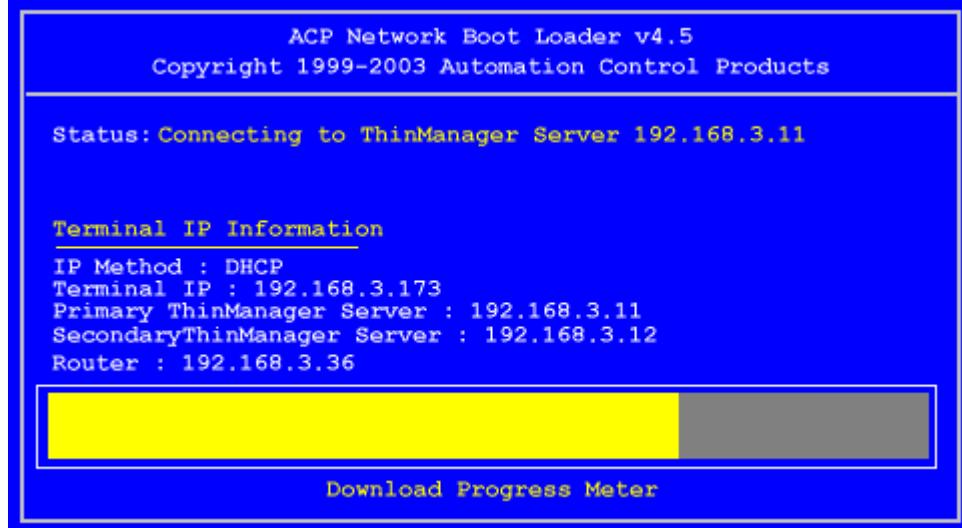
Boot Process - Firmware Download

The terminal will connect to the ThinManager Server and download the firmware.

The download bar will be purple if the terminal is using Multicast during the download. See MultiCast Configuration Page for details.

8.2.2 Static IP

Most models of ThinManager Ready thin clients allow the usage of static IPs. These are set by interrupting the boot process to launch the IP Configuration Menu and adding the static IPs.
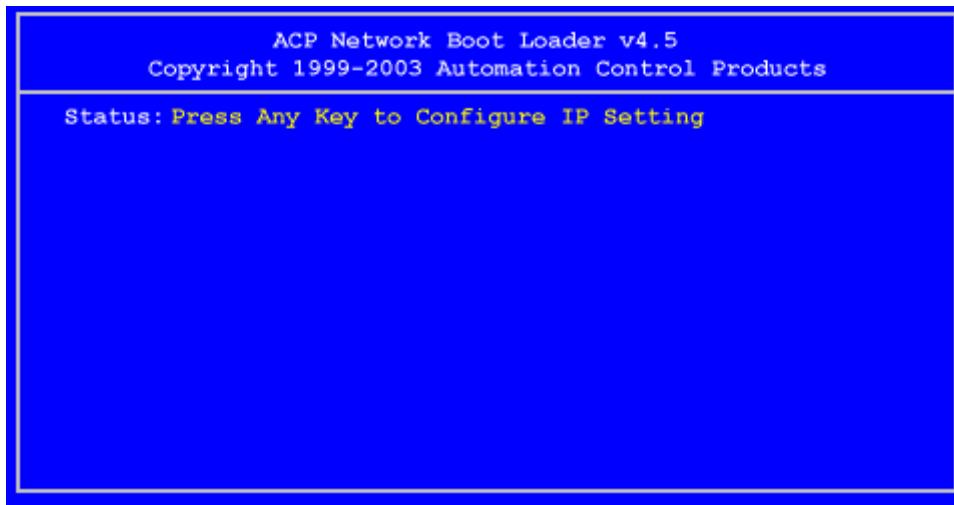
Boot Process - Press Any Key Prompt

To set the terminal to use a static IP, press **any key** at the appropriate moment of the boot sequence.
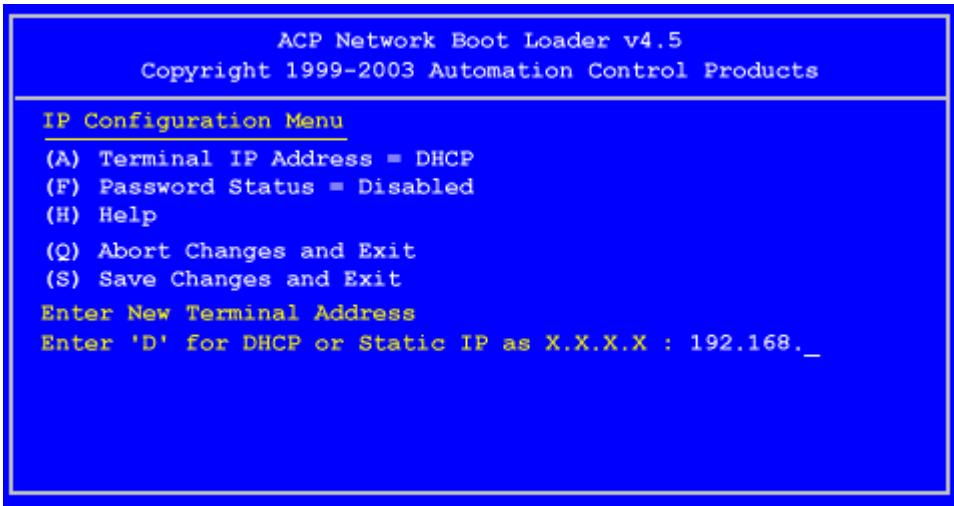
IP Configuration Menu – Static IP

Press the **A** to allow the client IP to change from DHCP.

Type in the static IP address for the client, including the separating periods and press the **Enter** key.

```
                    ACP Network Boot Loader v4.5
              Copyright 1999-2003 Automation Control Products

    IP Configuration Menu

    (A) Terminal IP Address 192.168.3.115
    (B) Primary ThinManager Server IP Address = 192.168.3.11
    (C) Secondary ThinManager Server IP Address = 192.168.3.12
    (D) Router IP Address = 0.0.0.0
    (E) Subnet Mask = 255.255.255.0
    (F) Password Status : Disabled
    (H) Help
    (Q) Abort Changes and Exit
    (S) Save Changes and Exit
    Enter new Terminal IP Address
    Enter 'D' for DHCP or Static IP as X.X.X.X : D
```

IP Configuration Menu - Options

Once the Terminal has a static IP assigned, the IP Configuration Menu will be shown to allow the setting of other values.

- **(A) Terminal IP Address** - This should be a unique address for the terminal.

- **(B) Primary ThinManager Server IP Address** - This should be the unique address for your main ThinManager Server.

- **(C) Secondary ThinManager Server IP Address** - The Secondary ThinManager field allows the terminal to use two ThinManager Servers. If the terminal cannot connect to the Primary ThinManager Server, it will connect to the Secondary ThinManager Server to receive its configuration. If you are not using a Secondary ThinManager Server, set the IP address to 0.0.0.0.

- **(D) Router IP Address** - Fill in the IP address of the router or gateway if one is being used. If not this should be set to 0.0.0.0.

- **(E) Subnet Mask** - Set this to your subnet mask. 255.255.255.0. is a standard setting.

- **(F) Password Status** - Allows a password to be set to prevent unauthorized people from changing the configuration.

- **(H) Help** - Will launch a Help to explain the IP Configuration Menu.

- **(Q) Abort Changes and Exit** - This will cancel any setting changes and let the terminal continue to boot with the old settings.

- **(S) Save Changes and Exit** - This will apply any changes and allow the terminal to continue to boot with the new settings.

Type the letter of the desired setting and type the IP address, with periods. Press the *Enter* key on the keyboard to accept each change.

Once configured the terminal will connect to the ThinManager Server and download the firmware and configuration.

8.2.3 Hybrid IP Addressing

ThinManager Ready thin clients that have BootROM version 5.01 or later have the ability to use DHCP for the client IP address and have the ThinManager Server IP addresses entered as static IPs to save having to configure the DHCP server with Option 066.

Selecting any key when prompted during bootup opens the IP Configuration Menu.
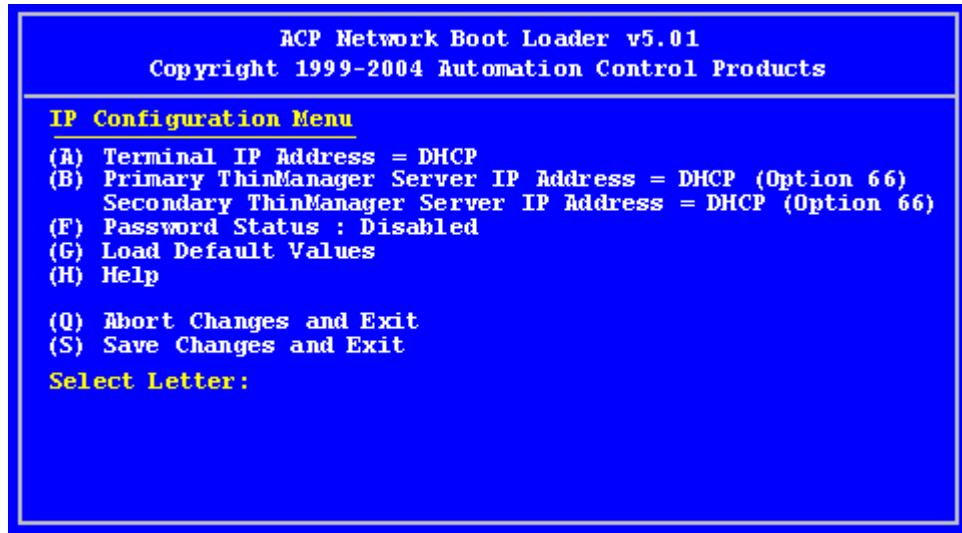
Boot Loader v5.01 Default Values

Typing the **B** key will allow the configuration of a static IP for the ThinManager Server. Type the numbers and periods for the address.
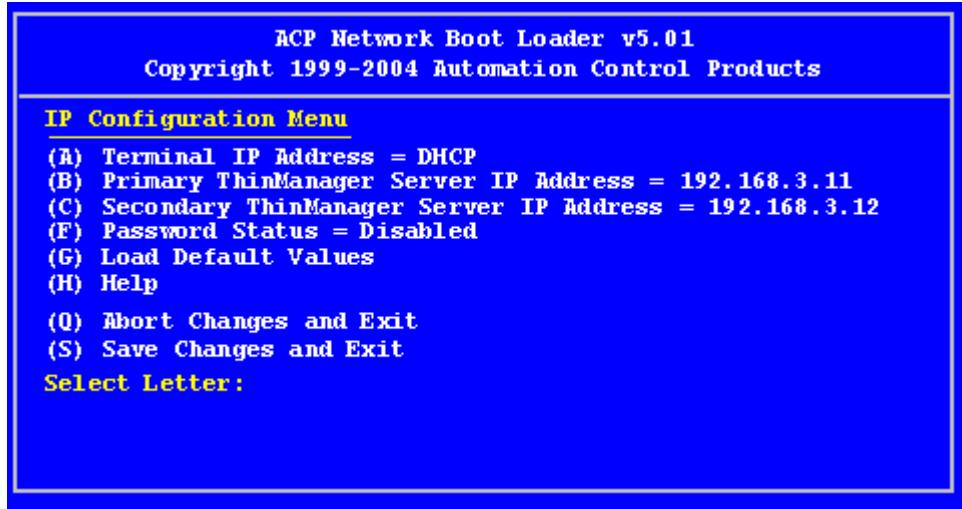
DHCP with Static ThinManager Server

Once a ThinManager Server is assigned, typing **C** will allow a redundant secondary ThinManager Server to be assigned.

Type **S** to save the changes and allow the connection to the ThinManager Server. The terminal will now boot using DHCP.

Note: The Escape key will let you exit the entry field and return to the IP Configuration Menu.

8.3 Configuring New Hardware

The configuration of terminals is done in ThinManager on the ThinManager Server and not on each individual terminal. When a new, undefined ThinManager Ready Thin Client is first connected to a ThinManager Server one of three things will happen:

- If the ThinManager Server has no terminals that are configured and offline, then the terminal will go into the **Create New Terminal Mode** and launch the **Terminal Configuration Wizard** on the ThinManager Server. Once the terminal is configured on the ThinManager Server it will automatically download its configuration upon boot up.

- If the ThinManager Server has terminals that are created and offline, the terminal will go into **Replace or Create Mode** and list the offline terminals that are available for selection. Once a configuration is selected, the terminal will take that identity. During any following boot up the terminal will automatically download its configuration.

- A third scenario is to use the **Auto-Create Terminal Mode** to create an array of terminals.

8.4 Create New Terminal Mode

Turning on a terminal for the first time will initiate the **Create New Terminal mode** if:

- No terminals are defined in ThinManager, or

- All the defined terminals are currently connected, or

- All the defined terminals that are turned off have the *Allow This Terminal To Be Replaced If Off Line* check box unselected.


```
ACP Network Boot Loader v5.01
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Please Wait while Terminal is defined on Server 192.168.3.11
```
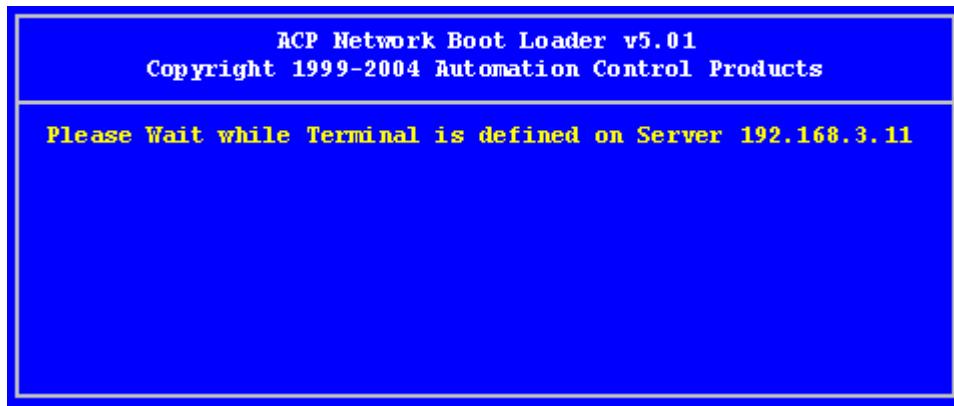
Create New Terminal Mode Screen

When a terminal enters the Create New Terminal Mode, the terminal will launch the Terminal Configuration Wizard on the ThinManager Server. The terminal will display a screen indicating that it will wait until the configuration is finished before progressing further.

8.5 Replace or Create New Terminal Mode

Turning on a terminal for the first time will initiate the *Replace or Create New Terminal Mode* if one or more of the defined terminals are offline and they have the *Allow This Terminal To Be Replaced If Off Line* check box selected.
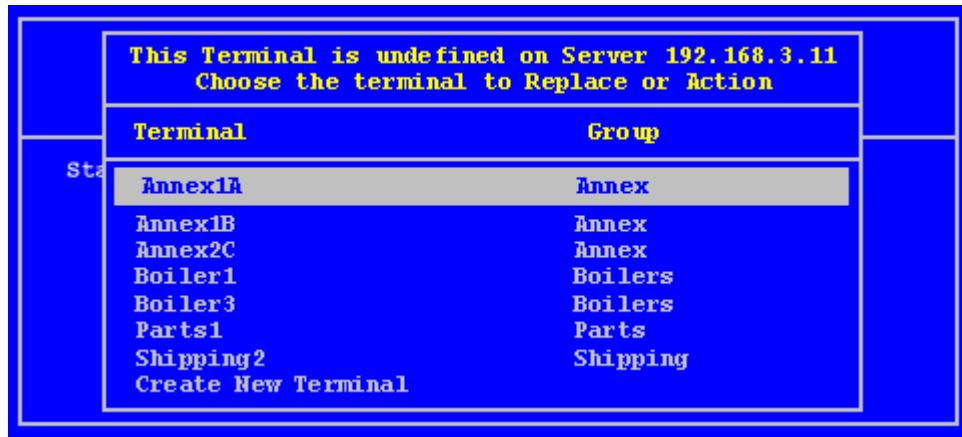
Replace or Create Mode

The screen will display all the offline terminals that the terminal can replace. Highlight the desired terminal name using the keyboard and press the *Enter* button. The terminal will retrieve the selected configuration and assume its identity.

8.6 Auto-Creation of Terminals

Auto-Create allows new terminals to be created and configured in an array, using the **Default Terminal** as a template.

Turning on a terminal for the first time will initiate the **Replace or Auto-Create Terminal** mode if:

- The Auto-Create mode is enabled by the selection of the *Enable AutoCreate* check box on the **Unknown Terminal** page of the **ThinManager Server Configuration Wizard**.
  The **ThinManager Server Configuration Wizard** is launched by selecting *Manage > Settings* from the ThinManager menu.

And

- The *Default terminal* is configured as a template for the new terminals.
  This is done by selecting *Manage > Configure Default Terminal* on the ThinManager menu.

And

- The user selects *Auto-Create* from the **Replace or Action Menu** as the terminal boots and connects. The user can do a replacement instead of an Auto-Create.

8.6.1 Enabling AutoCreate

Open the **ThinManager Server Configuration Wizard** by right clicking on the ThinManager Server in the tree and selecting *Modify*, or select *Manage > Settings* from the menu.

The terminal will be given the name of the **Auto-Create Mask** and a number, starting with "**0**". The Auto-Create Mask is configured on the **Unknown Terminals** page of the **ThinManager Server Configuration Wizard**.
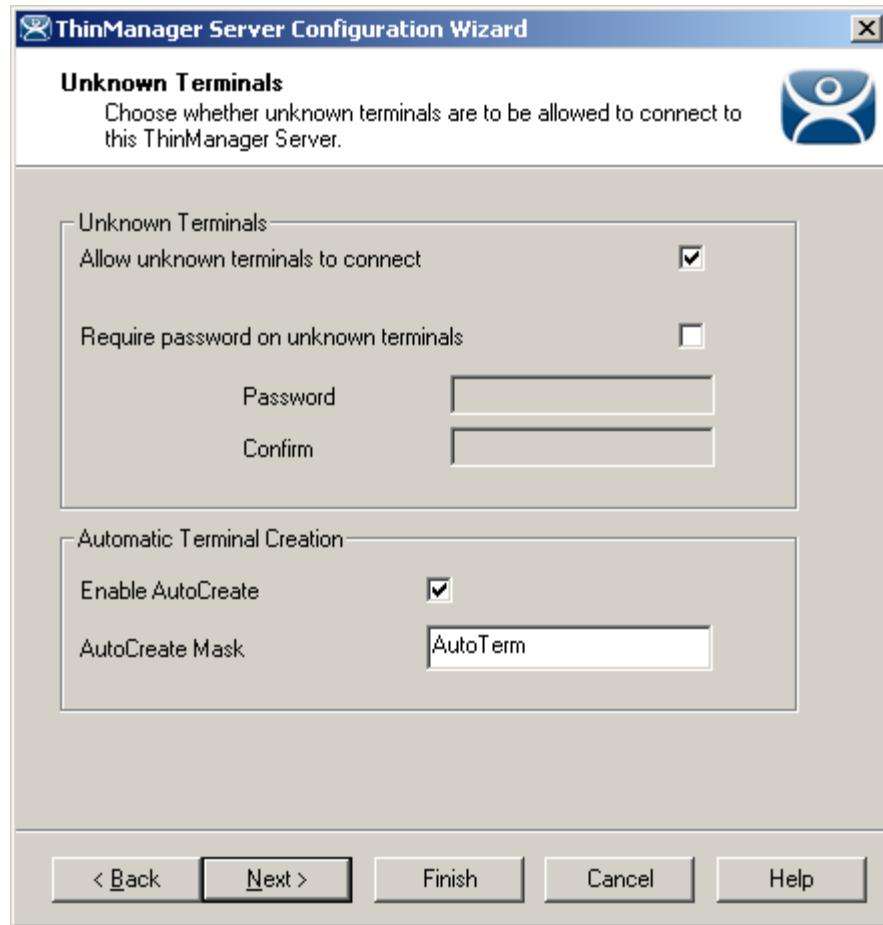

Unknown Terminals

Check the **Enable AutoCreate** checkbox and enter an AutoCreate Mask name. This allows new terminals to be added to the system and configured without additional input from the server.

8.6.2 Configuring Default Terminal

The Default Terminal is created by selecting *Manage > Configure Default Terminal*. This will launch the **Terminal Configuration Wizard** for a terminal pre-named "**Default**".
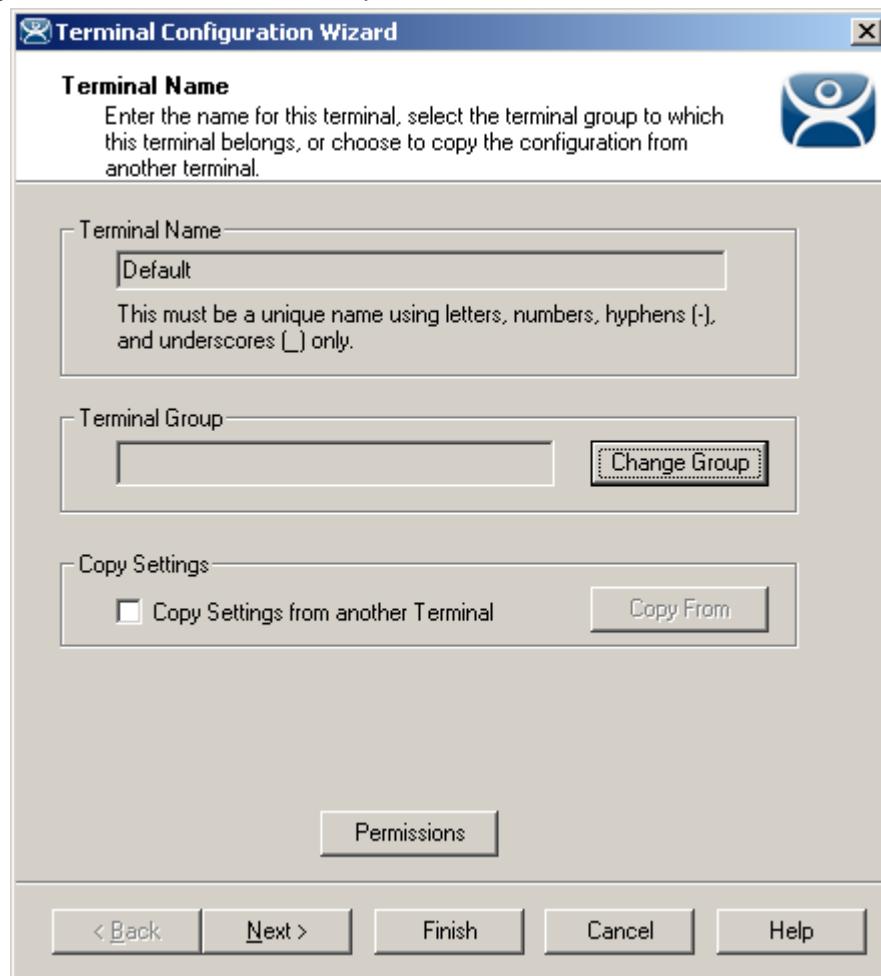

Default Terminal Configuration

Configure the terminal with the desired settings. The Default terminal can be added to a Group by selecting the *Change Group* button.

Once the wizard is finished, the Default terminal will be displayed in the ThinManager Server tree.
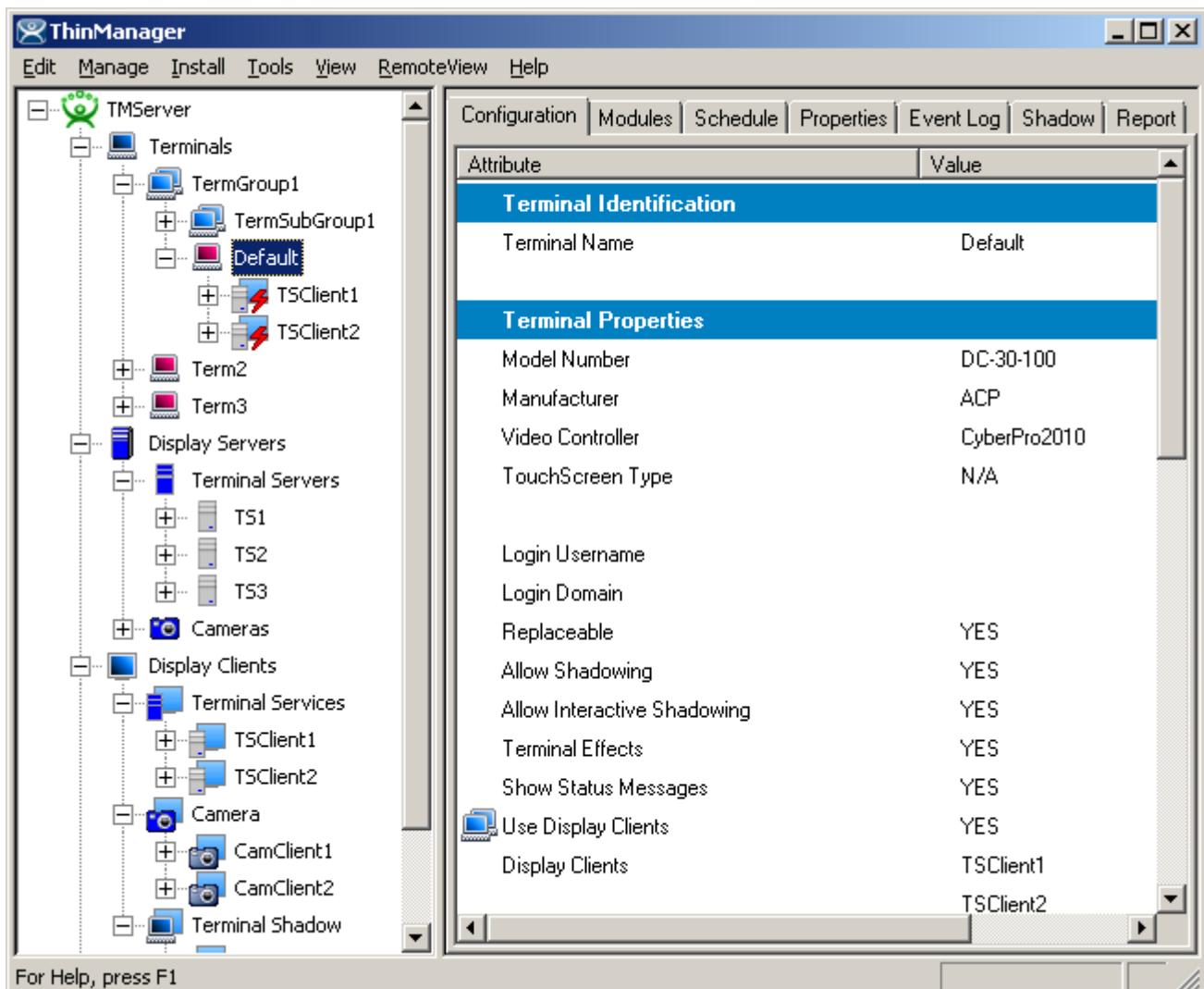
ThinManager Tree with Default Terminal

Once the **Enable AutoCreate** check box on the Server Properties window is checked and the Default Terminal is created and configured, any new terminal connected to the ThinManager Server will have **AutoCreate Terminal** as an option.

Replace or Action Menu

The user needs to scroll to **AutoCreate Terminal** and press the **Enter** key to automatically create and configure the terminal.

The new terminal will be given the AutoCreate Mask and a number, starting at 0, for its name. This name will also be entered in the **Username** field of the **Log In Information** page of the **Terminal Configuration Wizard**.