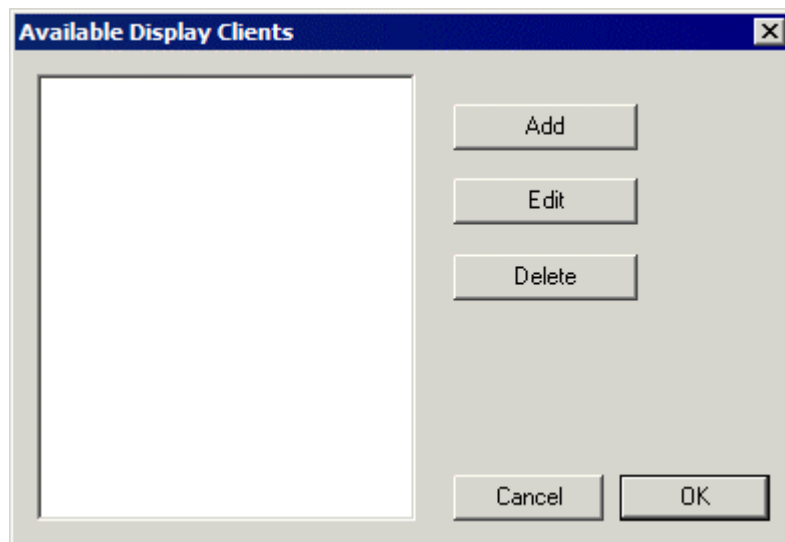# 13 Display Clients

Display Client is the term used to denote the graphic rendering of the output from a Display Server. This could be a traditional Terminal Server session, IP Camera display, a Terminal-to-Terminal Shadow session or a workstation session.

13.1 Display Client List

The **Display Client List Wizard** can be launched by either:

- Right clicking on the Display Client branch and choosing the ***Add Display Client*** command
- Right clicking on the Display Client branch and choosing the ***Edit Display Client*** command.

Display Client List Wizard

The opening window of the **Display Client List Wizard** will show any Display Clients that are defined or will be blank if none have been defined.

Fields:

- **(Unnamed)** – The list box shows Display Clients that are created.

Buttons:

- *Add Group* – This will launch the Display Client Wizard to create a new Display Client.
- *Edit Group* – This will open the properties for a highlighted Display Client.
- *Delete Group* – This will remove a highlighted Display Client from the list.
- *Cancel* – This will close the wizard without action.
- *OK* - This will close the wizard after accepting changes.

13.1.1.1 Display Client Name Page

Display Client Name Page

Importance of Page: This page starts the configuration wizard, sets the name, and the type of Display Client.

Fields:

- **Group Name** – This field is used to name the Display Client.

Settings:

- *Type of Display Client* drop-down box selects the function of the Display Client.
  - o *Terminal Services* – This creates a Display Client that allows a terminal to connect to a terminal server, login, and run a session.

- o **Terminal Shadow** – creates a Display Client that allows a terminal to be shadowed by another terminal.
- o **Camera** – creates a Display Client that allows the use of IP Cameras.
- o **Workstation** – creates a template for workstation deployment. The Workstation Display Client gets assigned to a specific workstation when it is applied to a terminal. See Virtual Workstations for details.

Buttons:

- **Permissions** - The button will launch the **Permissions** window that allows Permissions to be set for TermSecure. This is discussed in Permissions.

Why Change from Default Settings: The group needs a name and a type assigned to it.

This section covers Terminal Services Display Clients. Once the **Type of Display Client** is set to Terminal Services select **Next** to configure the group options.

13.2 Terminal Services Display Clients

The Terminal Services Display Clients of ThinManager have the same function as the Terminal Server Groups from pre-3.2 versions of ThinManager and the Application Groups of ThinManager 3.2 and 3.3. They allow a terminal to connect to a terminal server, login, and run a session. The specific terminal server that the terminal connects to is based on the Display Client configuration and options.

13.2.1.1 Display Client Options Page
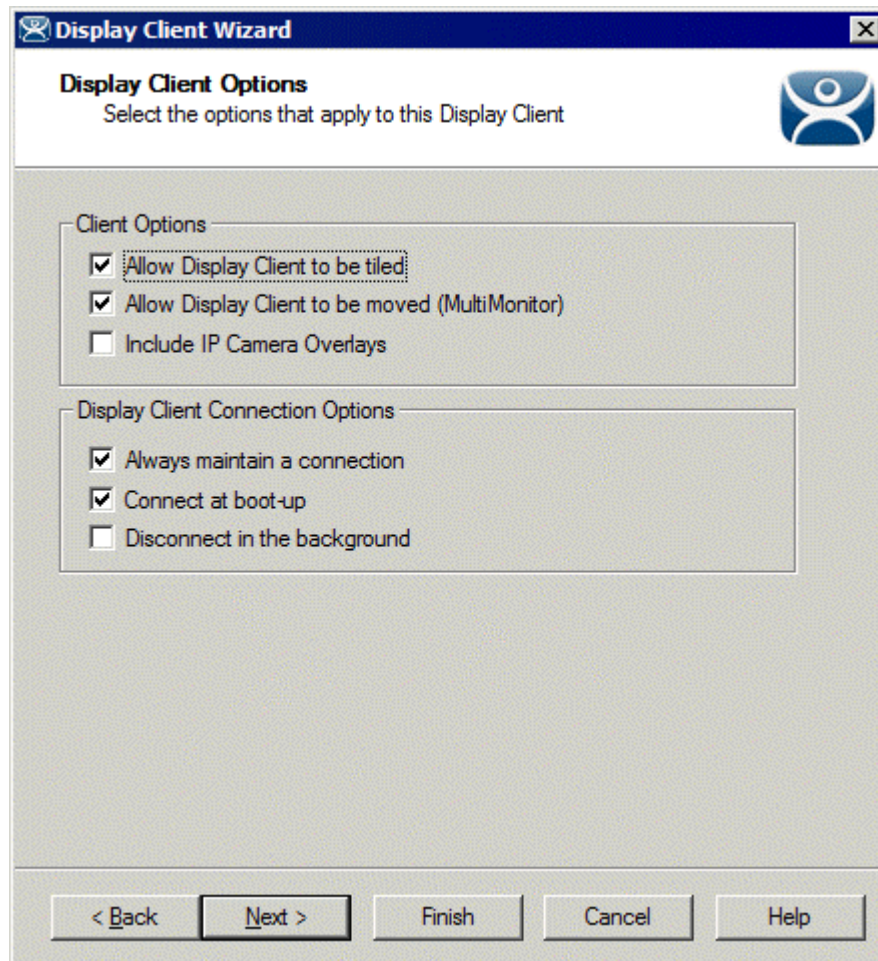
Display Client Options

**Importance of Page:** This page allows the configuration of Display Client parameters

Checkbox:

- *Allow group to be tiled* – If checked, this allows the Display Client to be tiled in SessionTiling. See SessionTiling Options for details.

- *Allow Group to be moved (MultiMonitor)* – If checked, this allows an Display Client to be moved from one MultiMonitor screen to another. See MultiMonitor for details.

- **Include IP Camera Overlays** –This will allow IP Camera overlays to be added to this Display Client.

- *Always maintain a connection* – This keeps a session active, reconnecting and restarting if it is closed. If unchecked, the user can close a session and another session won't start automatically.

- *Connect at boot-up* – If checked, the terminal will start a session for this Display Client at boot up. If unchecked, a user action is required to start the session.

- *Disconnect in background* – If checked, an Display Client being used in a MultiSession configuration will disconnect once it is moved into the background. This could be done to require fewer resources.

Why Change from Default Settings: The *Alays maintain a connection* and *Connect at boot up* checkboxes, if unselected, will lower the demand on the terminal servers by allowing sessions to be closed until needed.

Select *Next* to continue, *Finish* to save and close, or *Cancel* to close without saving.

13.2.1.2   Terminal Services Display Client Type Page
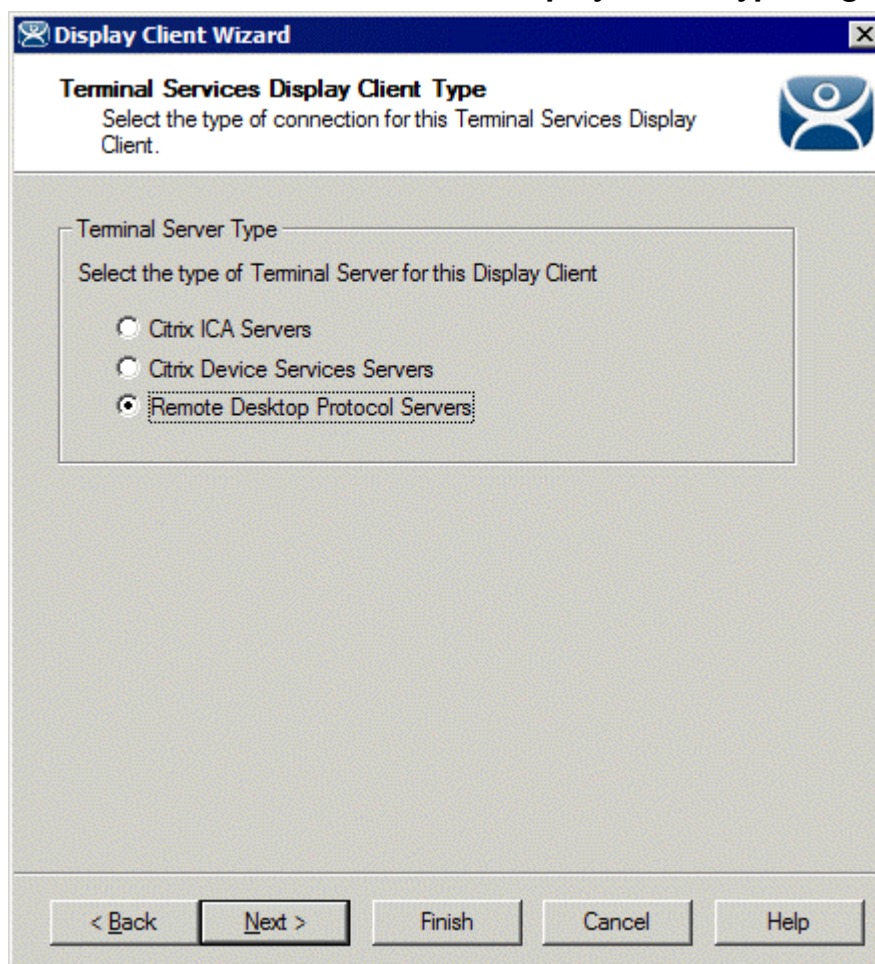
Terminal Services Display Client Type

Importance of Page: Each Terminal Services Display Client can use a single protocol to connect to the terminal servers.

Settings:

- **Citrix ICA** – This allows the use of the Citrix© ICA protocol in client to server communications.

- **Citrix Device Services** – This is a legacy version of the ICA protocol used on Windows NT and Windows 2000 terminal servers.

- **Remote Desktop Protocol (RDP)** – This is the default protocol from Microsoft©. It is automatically installed on Microsoft© terminal servers.

Why Change from Default Settings: Change to the Citrix© ICA protocol if the Citrix© ICA protocol is going to be used instead of the default RDP.

Select *Next* to continue, *Finish* to save and close, or *Cancel* to close without saving.

13.2.1.3   Terminal Services Display Client Options Page
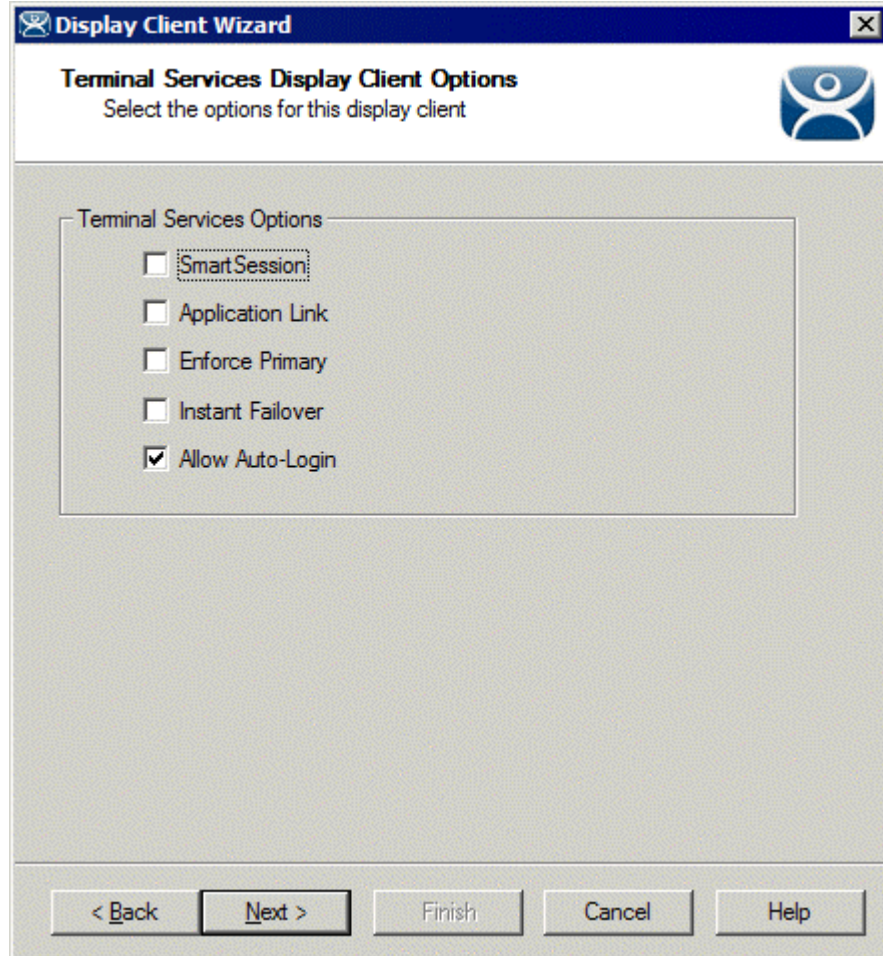
Terminal Services Display Client Options

Importance of Page: This page sets the roles of the Display Client.

Checkbox:

- *SmartSession Group* – - This adds SmartSession to the Display Client which provides load balancing between member terminal servers.
  SmartSession uses CPU availability, memory, and the number of sessions on the member terminal servers to determine the load on the servers. Thin clients connect to the terminal server in the Display Client with the most available resources. See SmartSession Option for details.

- *Application Link Group* (AppLink) – - AppLink, provides the Initial Program function to thin clients that connect to members of the Display Client. The Initial Program function launches a program instead of the desktop. Closing the program will end the connection and force a reconnection to a session running the application. See AppLink Option for details.

- *Enforce Primary* - This allows a thin client to connect to its original terminal server if that terminal server has failed and recovered. This is not available if SmartSession is selected.
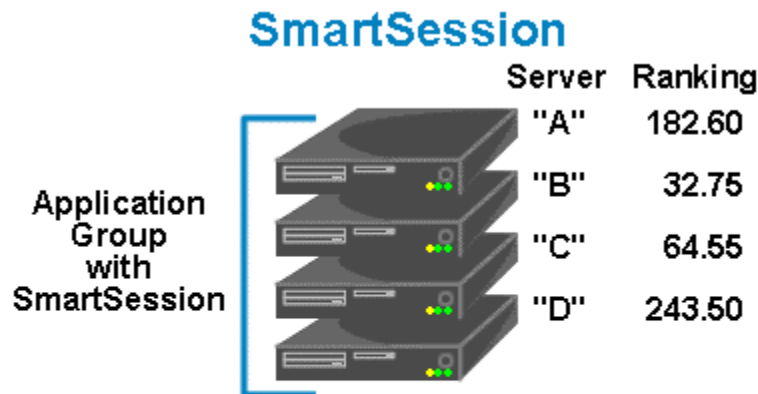
- ***Instant Failover (requires license)*** - This provides Instant Failover where the terminal will connect to two terminal servers in the Display Client. The terminal will have an active session on two terminal servers but will only display one session. If the first terminal server fails, the session of the second terminal server session is immediately displayed, eliminating any downtime due to terminal server failure.

- ***Allow Auto-Login*** - If checked, the terminal will use the login information supplied in the terminal configuration to automatically logon to the terminal server. If unchecked, the user will be required to manually login to the terminal server.

Why Change from Default Settings: Display Client features like SmartSession and Instant Failover are added on this page. You can force users to manually login to a session by deselecting the ***Allow Auto-Login*** checkbox.

Note: Enforce Primary is not available with SmartSession.

13.2.1.4 SmartSession Option

SmartSession is a load balancing strategy that allows terminals to connect to the member of an Terminal Services Display Client that has the most available resources. ThinManager monitors the **CPU load**, **memory availability**, and **number of sessions** on the terminal servers and ranks them by availability. When a thin client connects to a member of an Terminal Services Display Client with SmartSession, the terminal connects to the terminal server with the lightest load.

SmartSession

Each member terminal server needs **SmartSession** configured in the **Terminal Server Display Server Wizard**. See Terminal Server Capabilities Page for details.

Once ThinManager has polled the terminal servers and established the availability of their resources, ThinManager passes the **Server Ranking** to the thin clients for its connection instructions.
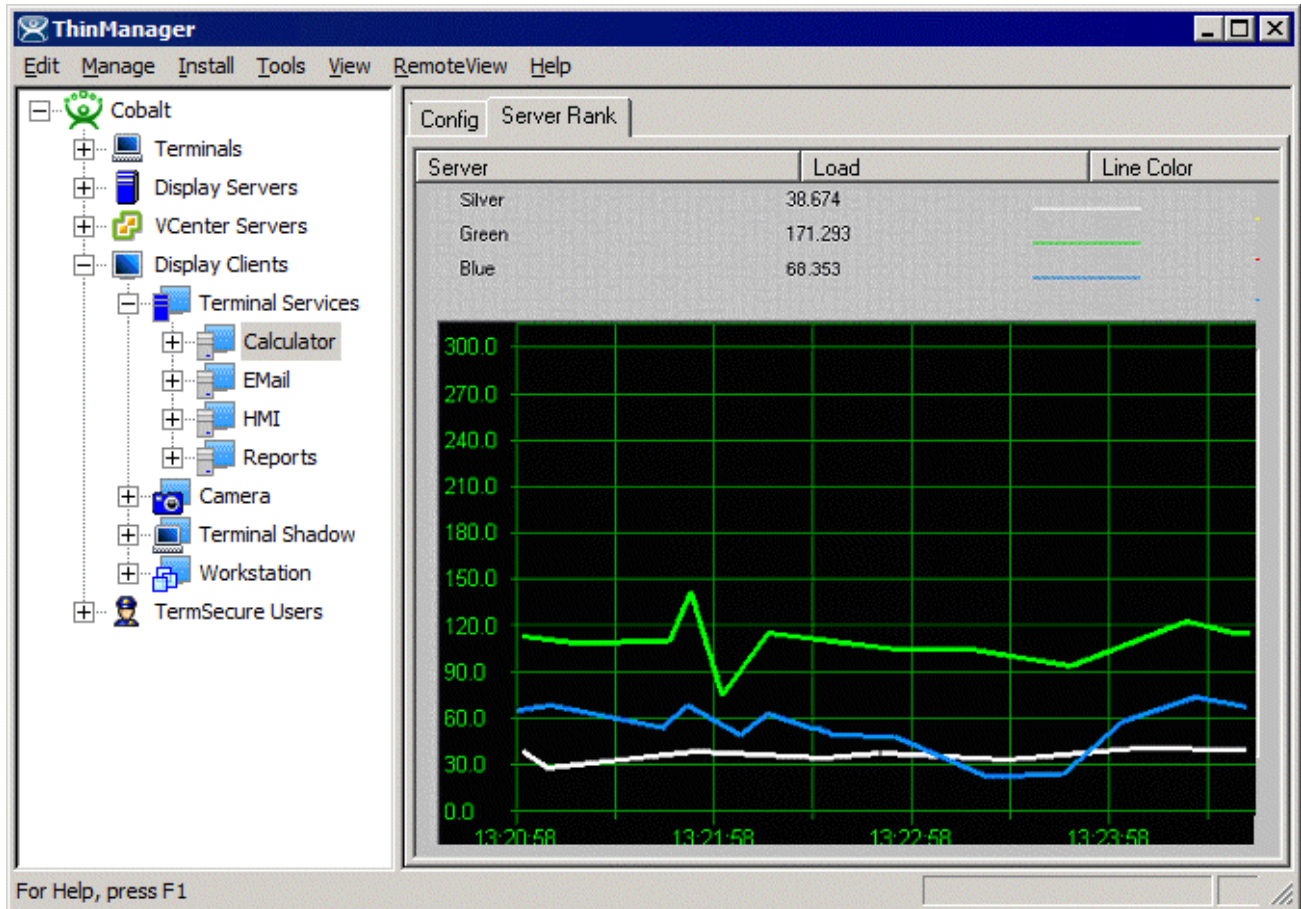
ThinManager Interface – Server Rank Tab

The Server Rankings are displayed on the Server Rank tab when a Terminal Services Display Client is highlighted in the ThinManager tree. In the example above a thin client would connect to Green because it has the lowest load.

13.2.1.5 AppLink Option

AppLink provides the *Initial Program* functionality to a Terminal Services Display Client. If AppLink is enabled, the path to an Initial Program is entered into the **AppLink Page** of **Terminal Services Display Client Wizard**. This program will be the only program to run in that session.

Note: If the AppLink option is not used then the terminal services session will display a desktop.

Note: If a Terminal Services Display Client contains several terminal servers, the path must be valid on all terminal servers. If different terminal servers have different paths to the desired program, write a batch file to open the program.

13.2.1.6 Instant Failover Option

Terminal Services Display Clients can provide **Instant Failover** without using the **Instant Failover Module**. With Instant Failover a terminal will connect to a session on two terminal servers. Both sessions are active but

only one is displayed. If the first terminal server fails, the second session is immediately displayed, eliminating any downtime due to terminal server failure.

Note: AppLink and Auto-Login is normally used with Instant Failover to provide instant access to an application.

Instant Failover is configured by selecting the *Instant Failover* checkbox on the **Terminal Services Display Client Options** page of the **Terminal Services Display Client Wizard**,

Instant Failover works with the terminal servers of a Display Client, not between different Display Clients.

Note: Do not use the Instant Failover Module when using Instant Failover in Display Client.

In a standard **Terminal Services Display Client**, the terminal will use the first listed terminal server as the primary server and will use the second listed terminal server as the secondary server.

If using **SmartSession**, the primary session will be on the server with the lightest load and the backup session will be on the terminal server with the second lightest load.

13.2.1.7 Display Client Members Page
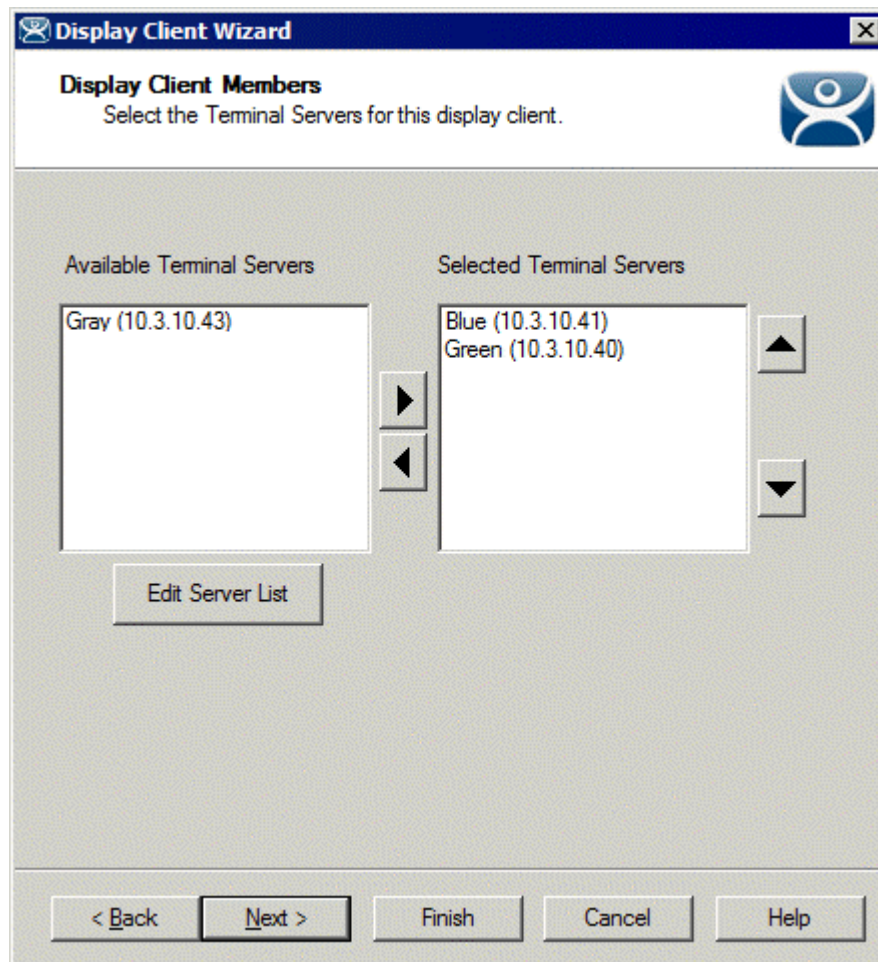
Display Client Members

Importance of Page: This allows the selection of the terminal servers that will be members of the Display Client. Adding multiple terminal servers to the *Selected Terminal Server* list will establish failover.

List Box:

- **Available Terminal Servers** – This is the list of the terminals configured in the Terminal Server Configuration Wizard and available to the terminal.
  If the Available Terminal Server list box is empty the Terminal Server Configuration Wizard can be launched with the *Edit Server List* button to define the terminal servers.

- **Selected Terminal Servers** – This is the list of terminal servers that the Display Client will use. Move the terminal servers to this list with the left and right arrow or by double clicking on the name. Listing two or more terminal servers configures Failover.
  The terminal will connect to the terminal servers in the order listed unless SmartSession is used. The terminal will connect to the terminal server with the lightest load if SmartSession is being used.

Buttons:

- **Arrows** – The left and right arrows move the terminal servers between list boxes. The up and down arrow change the order that the terminal servers are used. The top terminal server is considered the primary terminal server.

- *Edit Server List* – This launches the **Terminal Server Configuration Wizard** that allows terminal servers to be defined within ThinManager. Selecting *Manage > Terminal Server List* from the ThinManager menu will also launch the Terminal Server Configuration Wizard.

Why Change from Default Settings: It is critical to list the terminal servers that the Display Client will use. The wizard will not advance without a terminal server selected.

If the *Available Terminal Servers* column is empty, the **Terminal Server List Wizard** needs to be run to define the terminal servers. Select the *Edit Server List* to launch the Terminal Server Configuration Wizard and define the terminal servers.

If the Display Client is using the SmartSession option, the *Next* button will launch the **SmartSession Settings** page.

If the Display Client is not SmartSession Group the *Finish* button will complete the Display Client configuration.

13.2.1.8 Display Client SmartSession Settings Page

Smart Session Settings

Importance of Page: This allows tweaking of SmartSession values by adjusting the weights of the SmartSession settings.

ThinManager multiplies the CPU utilization, Memory utilization, and number of sessions on the terminal server by the *Weight* shown to define the SmartSession terminal server's available resources.

The higher the *Weight*, relative to the others, the greater the importance that parameter has in determining the load for SmartSession.

The SmartSession load = (CPU weight * CPU Utilization %) + (Memory weight * Memory Utilization %) + (Session weight * Session Utilization %)

Settings:

- **CPU Utilization Weight** – This is the CPU multiplier.

- **Memory Utilization Weight** – This is the Memory multiplier.

- **Session Weight** – This is the Session multiplier.

Queuing controls the rate that terminals connect to the terminal servers in the Display Client to allow processor intensive applications to load one at a time instead of many sessions forming at once, bringing the server to a halt. As terminals that use SmartSession Queuing boot, they request their terminal server from ThinManager. ThinManager will send the first terminal to the terminal server with the lightest load and will put

the other terminals in a queue for the interval defined in the ***Min _ Sec*** field. This allows the terminal server load to stabilize and allows ThinManager to re-sample the loads and send the terminal to the terminal server with the lowest current load.

Fields:

- ***Min _ Sec*** – This is the amount of seconds that a terminal will wait in the queue before being sent to a terminal server that has another terminal connecting. The terminal may wait longer than this value to connect if the CPU of the terminal server exceeds the ***Maximum CPU Utilization*** defined on the **SmartSession Configuration** page of the **Terminal Server Configuration** wizard. See SmartSession Configuration Page for details.

- ***Max _ Sec*** – This is the maximum amount of seconds that a terminal will wait in the queue before being sent to the terminal server to login, regardless of the load.

Checkbox:

- ***Infinite*** - If the ***Infinite*** checkbox is selected, ThinManager will wait until the CPU utilization of the terminal server has regained an acceptable range before sending other terminals to it to login.

Why Change from Default Settings: The values can be tweaked to alter performance, if needed.

Note: The ***Weighs*** are relative. Increasing all three ***Weights*** from "1" to "10" doesn't change the relative values.

If the Display Client uses the AppLink option, an **AppLink** page will be displayed by selecting the ***Next*** button.

13.2.1.9   Display Client Linked Application Page

AppLink Path

Importance of Page: This page configures the Display Client as an AppLink group where it will launch a single application in the session. If this application is closed the terminal will reconnect and re-launch the application.

Fields:

- *   *Program Path and Filename* - Enter the path to the desired application in the field.

Note: Quotation marks may be needed when there is a space in the path.

- *   *Command Line Options* – This field provides a space for command line options and switches. This field may not be required.

- *   *Start in the following folder* - This field is provided in case you need to specify the working directory for the program when using a relative path for the initial program. This field may not be required.

Buttons:

- *   **Browse** – The Browse button will allow you to select the executable file using a file browser. Make sure the path is correct on all terminal servers.
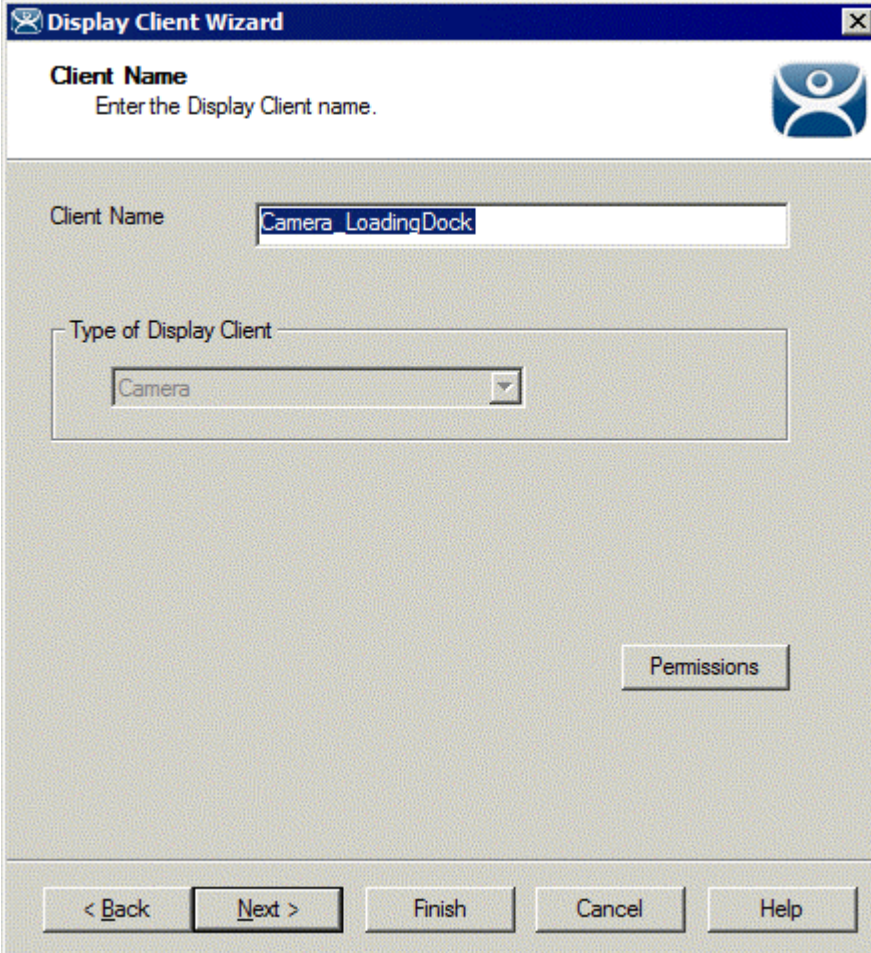
Note: If a Terminal Services Display Client contains several terminal servers, the path must be valid on all terminal servers. If different terminal servers have different paths to the desired program, write a batch file to open the program.

Why Change from Default Settings: This allows you to control a users access. If the Display Client uses AppLink the user will not get a desktop or icons but will be limited to the application specified. Closing it will re-launch the program, assuring that it is always running.

Selecting the *Finish* button will close the Display Client List wizard and display the created terminal server groups.

13.3 Camera Display Clients

The Camera Display Client configuration wizard can be launched by right clicking on the **Camera** branch of the ThinManager tree and selecting the *Add Display Client* option.

Camera Display Client Wizard – Name

Importance of Page: Allows naming and selection of Display Client type.

Fields:

- **Client Name** – Name for Display Client.
- **Type of Display Client** – Drop-down to select type of Display Client.

Button:

- **Permissions** – Sets TermSecure permissions. See Permissions for details.

Why Change from Default Settings: The display client needs a name.

Enter the name of the Display Client and any TermSecure permissions on this page.
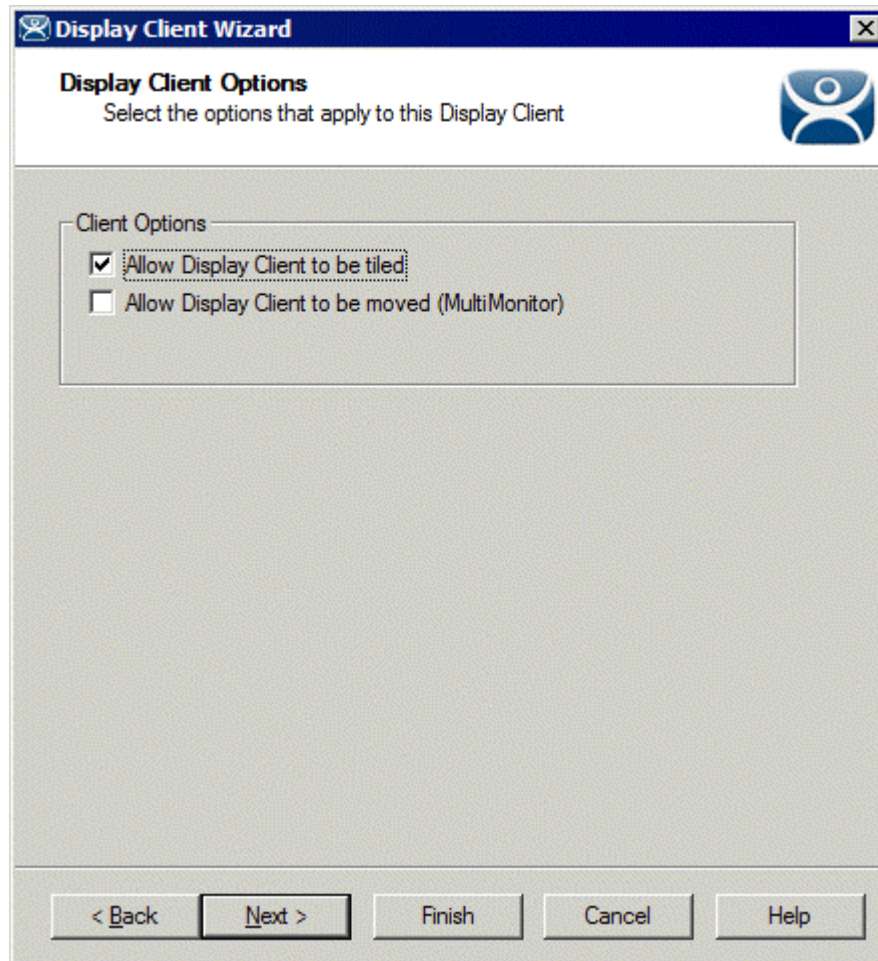
Camera Display Client Options
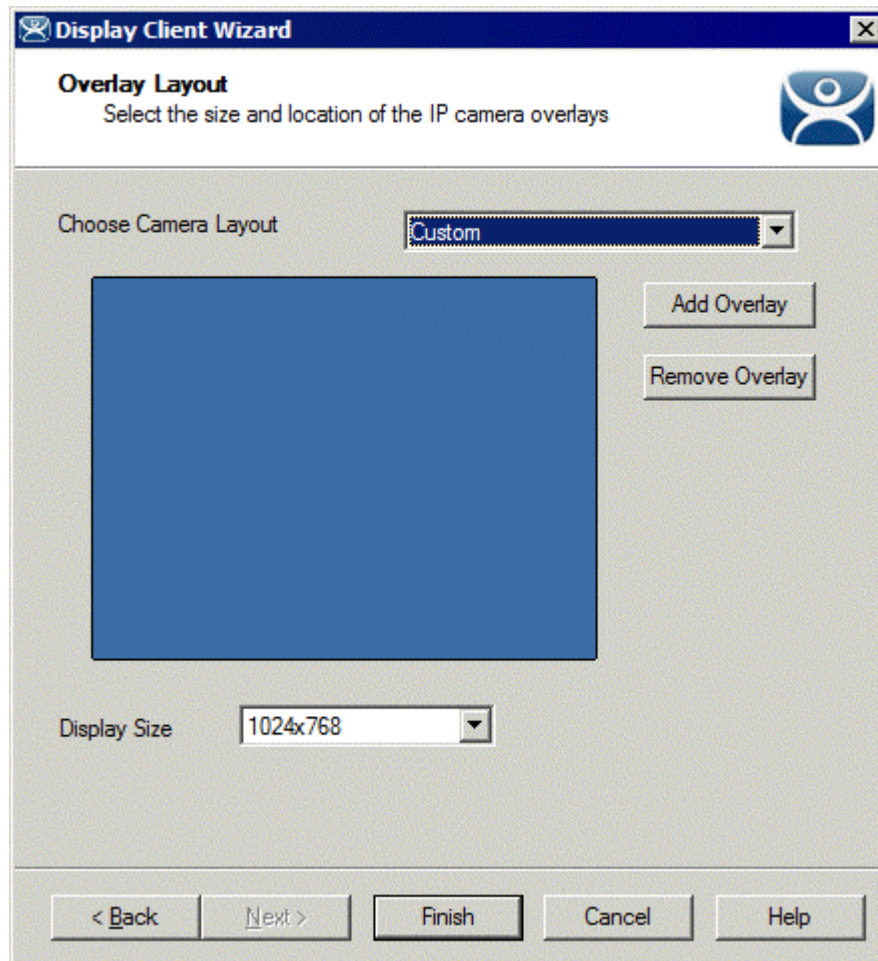
Importance of Page: Sets Display Client options.

Checkbox:

- **Allow Display Client to be tiled** – Allows tiling of the client.
- **Allow Display Client to be moved (MultiMonitor)**– Allows the Display Client to be opened in any MultiMonitor window.

Why Change from Default Settings: Provides additional options.

Select if this Display Client can be tiled and if when using MultiMonitor it can be moved to a different screen.

13.3.1.1   Overlay Layout Page

Camera Display Client Overlay Layout

Importance of Page: Sets camera layout

Settings:

- **Choose Camera Overlay** – Allows you to set the layout of the displays. You may have a single overlay or multiple overlays on the Display Client.

- **Display Size –** Sets the size (resolution) of the display to be shown.

Buttons:

- **Add Overlay** – Adds an overlay to the Display Client.

- **Remove Overlay** – Removes a highlighted overlay from the Display Client.

Why Change from Default Settings: You need at least one overlay in the Display Client.

This page determines the layout of the camera overlays. You can define your own custom layout or choose from predefined layouts. The *Display Size* selection should be set to the resolution of the terminal screen to which the Display Client will be added. The picture on this page represents the overlay layout.
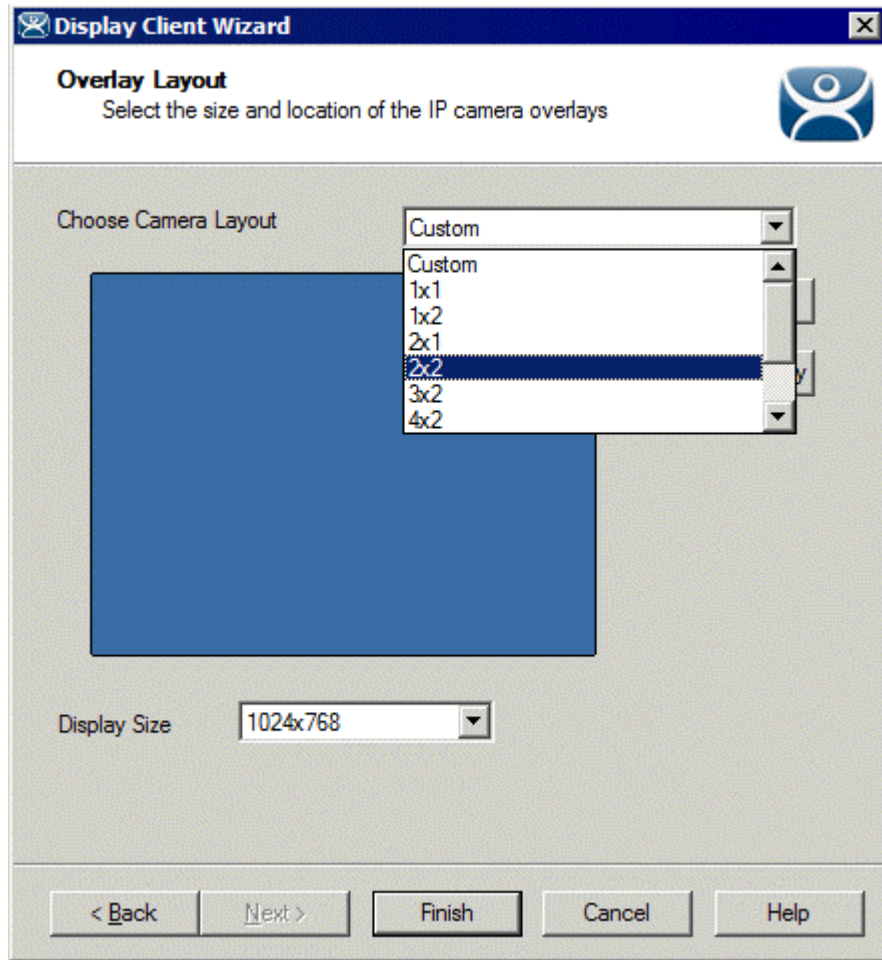
Camera Display Client Layout Selection

Use the layout drop down to select the desired layout.
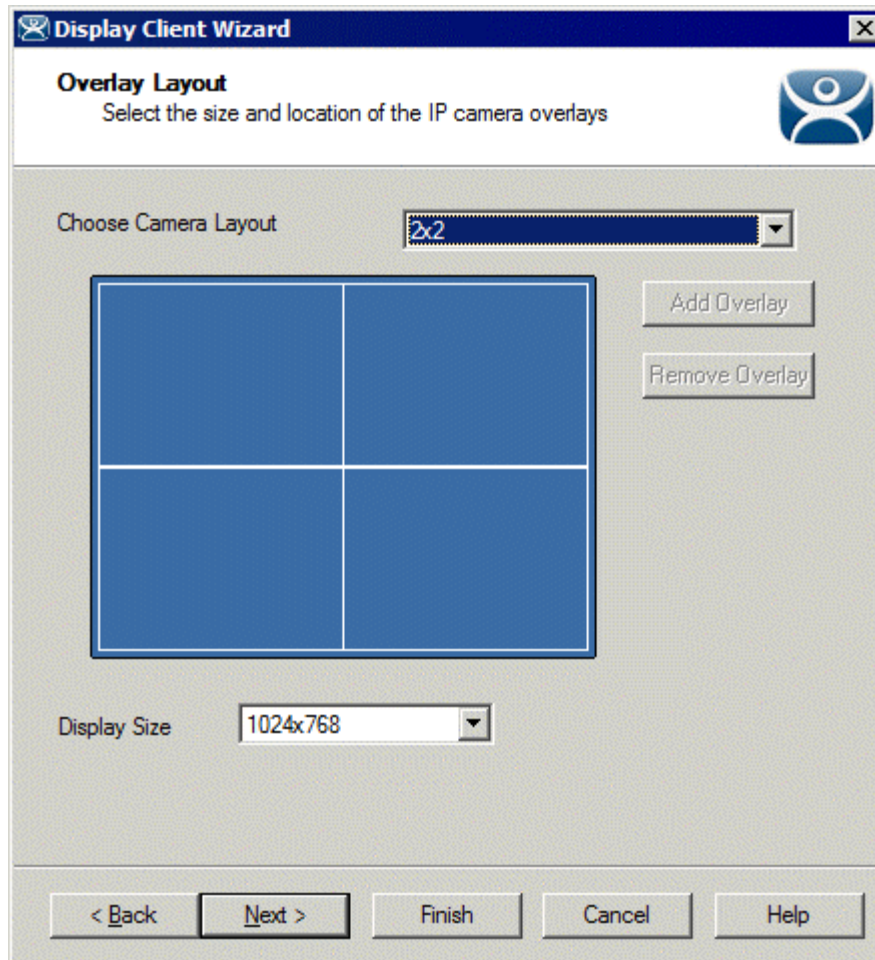
Camera Display Client 2x2 Layout Selection

Once a layout has been selected, it will be represented graphically. Select **Next** to configure the overlays.

13.3.1.2   Overlay Cameras Page

Camera Display Client Overlay definition

Importance of Page: Configures the overlays.

Fields:

- **Overlay Name** – Name for the overlay (filled in by default).

Settings:

- **Left** – Sets the left side of the overlay in pixels.
- **Top** – Sets the top of the overlay in pixels.
- **Width** – Sets the overlay width in pixels.
- **Height** – Sets the overlay height in pixels.

Buttons:

- **Add** – Adds a camera to the overlay.
- **Delete** – Removes a highlighted camera from the overlay.
- **Set Initial Camera** – Sets the initial camera from a series of cameras.
- **Overlay Options** – Launches the **Overlay Options** page.

Checkbox:

- **All Cameras Available** – This makes all cameras available if checked. If unchecked the *Add* button allows specific cameras to be added.

Why Change from Default Settings: Each Camera Display Client needs overlays.

Each overlay will be given a default name. The grey region of the screen representation is the overlay which is currently being configured. If the *All Cameras Available* checkbox is checked, all of the cameras will be available to be selected by the user at the terminal.
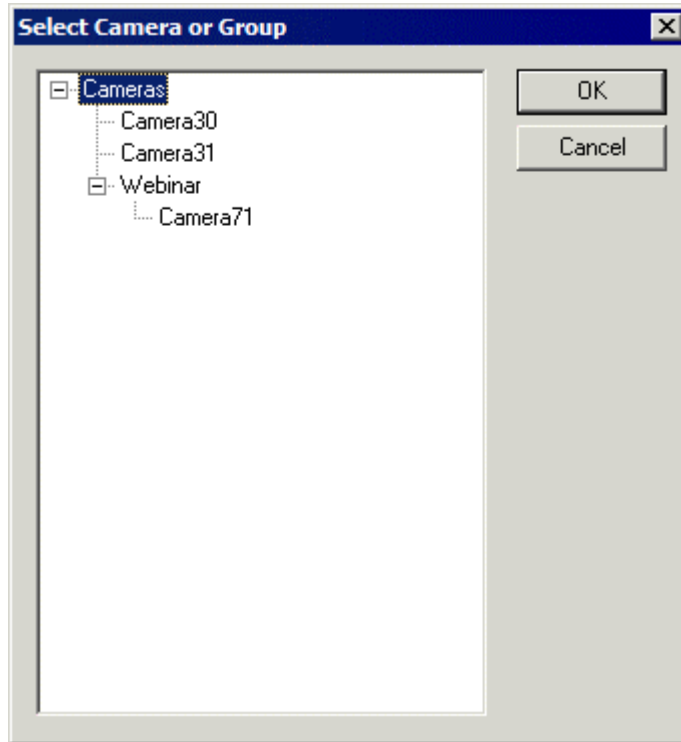
Set Initial Camera Dialog

Selecting the *Set Initial Camera* button allows the camera the overlay will start on at boot up to be selected.
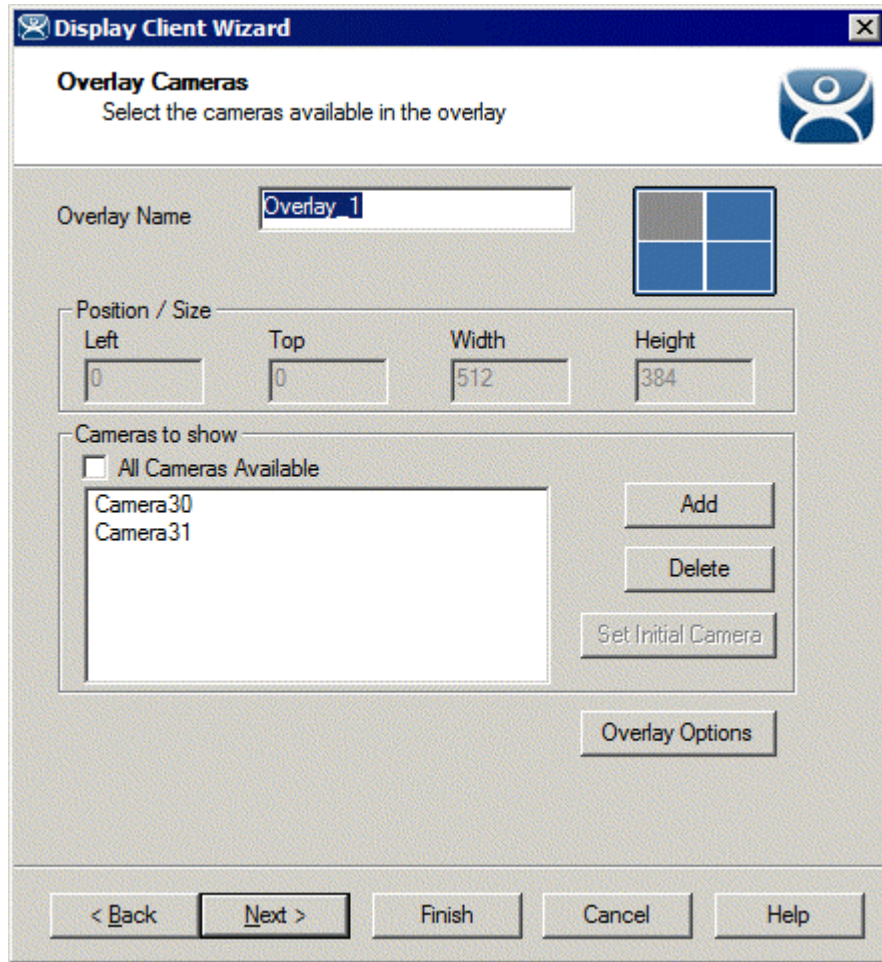
Overlay Camera Selection

If the ***All Cameras Available*** checkbox is unchecked, cameras must be added manually. Use the ***Add*** button to add cameras to the list. Adding more than one camera allows the user to select from these cameras at the terminal and allows the cycling between the listed cameras.
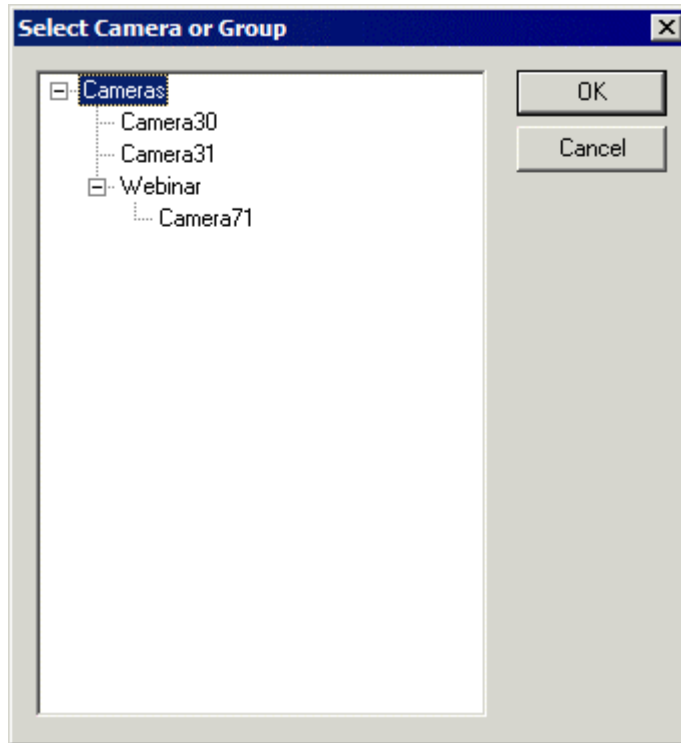
Camera Selection
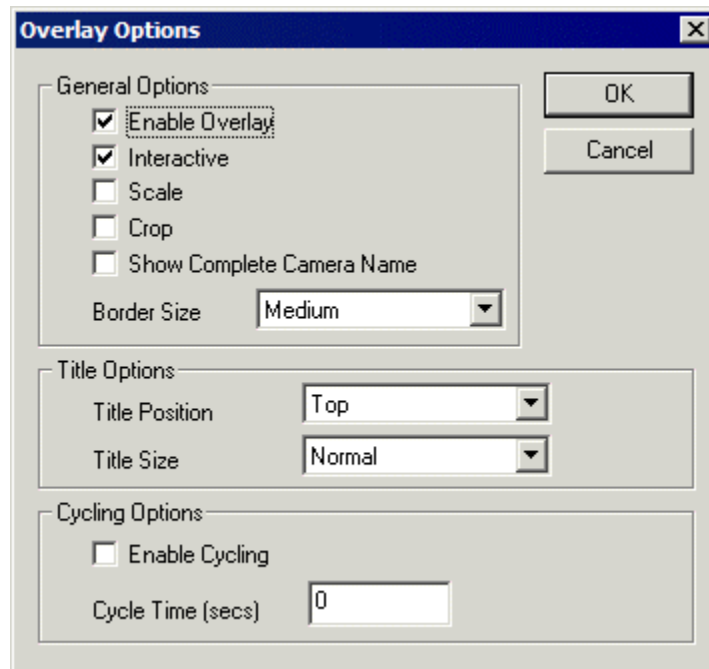
Overlay Options

Clicking the **Overlay Options** button will allow the setting of additional overlay options.

General Options:

- **Enable Overlay** – This option allows the overlay to be started in a disabled non-visible state. The TermMon ActiveX Control can be used by an application to enable the overlay.

- **Interactive** – This option allows the user on the terminal to interact with the overlay. If the user clicks in the overlay area, he can perform functions such as switching cameras and making the overlay full screen.

- **Scale** – This option will scale camera frames to be to the size of the overlay window. Aspect ratio will be maintained.

- **Crop** – This option will crop the camera frame if it is larger than the camera overlay. This option when combined with the *Scale* option will always fill the entire overlay area.

- **Show Complete Camera Name** – Using this option allows the entire path of the camera to be displayed. The path includes any groups of which the camera is a member.

- **Border Size** – This setting determines the size of the overlay outside border.

Title Options:

- **Title Position** – This is the position of the camera name within the overlay.

- **Title Size** – This is the size of the camera name when displayed within the overlay. Set this to *Don't' Show Title* if you do not want the camera name displayed.

Cycling Options:

- **Enable Cycling** – Check this setting to cycle between the cameras assigned to the overly.

- **Cycle Time** – This is the time in seconds that the overlay will display each camera before switching to the next camera.
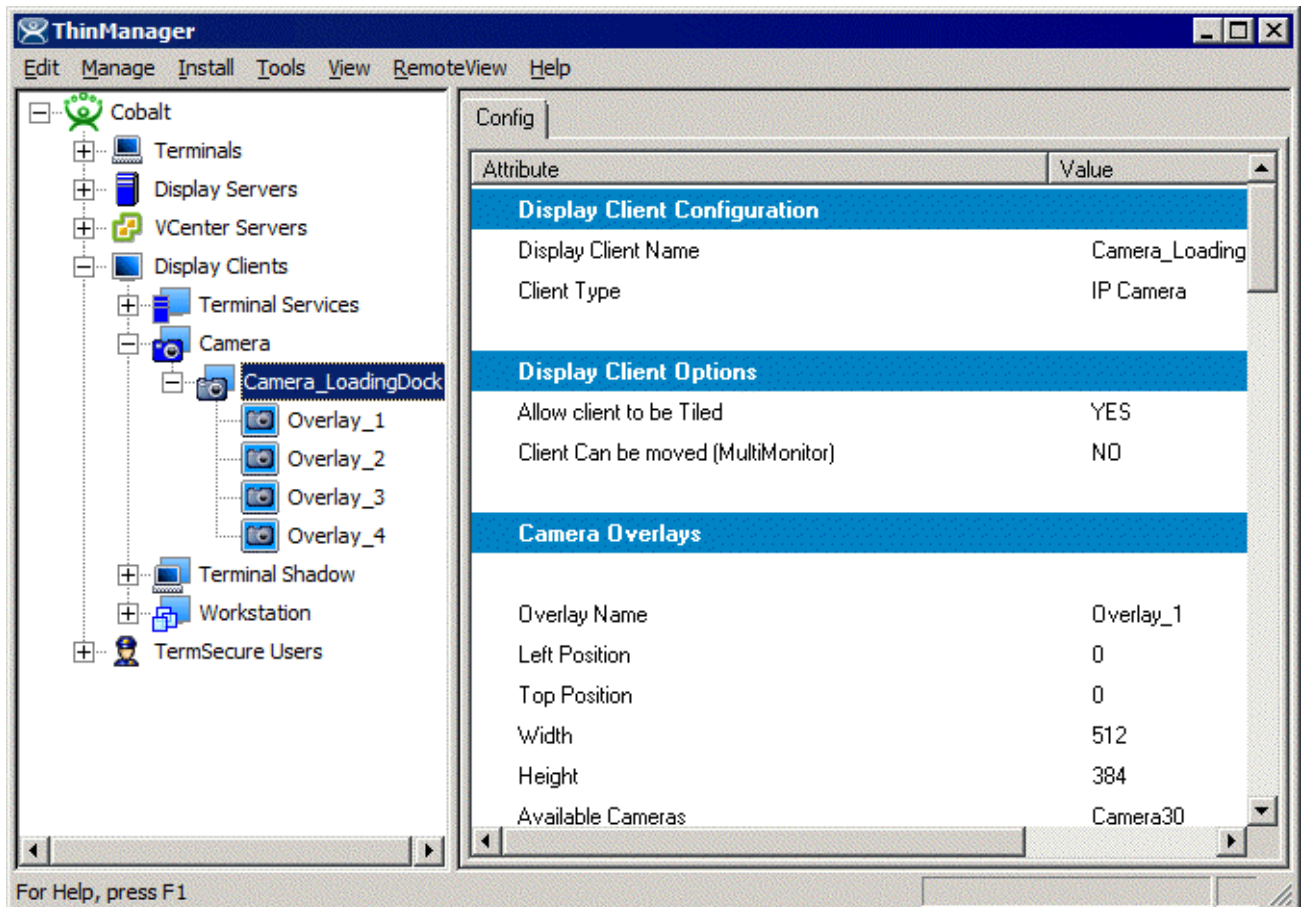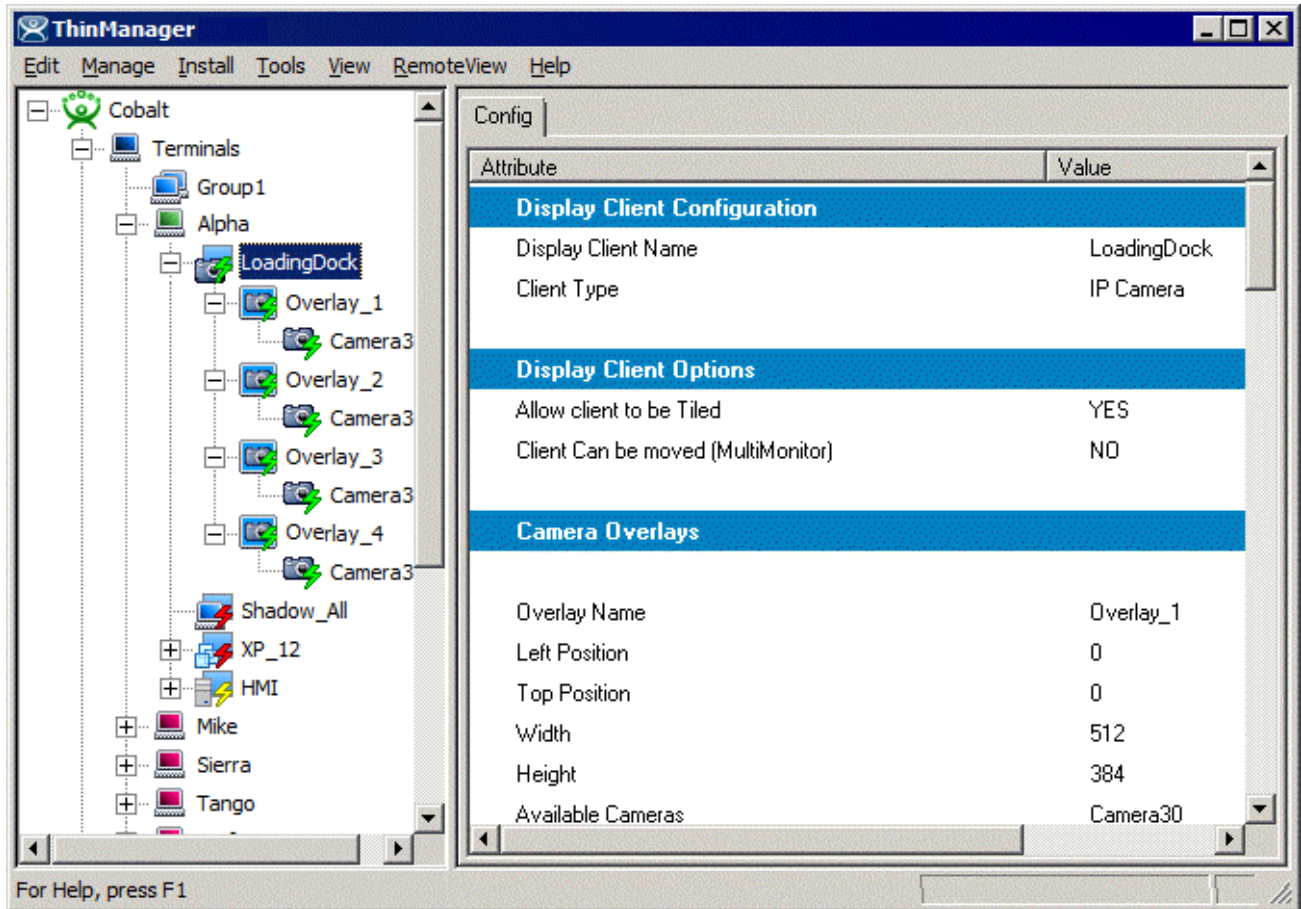

Camera Display Client Tree View

Once a Camera Display Client has been configured it will be reflected in the ThinManager tree under **Display Clients->Camera.**
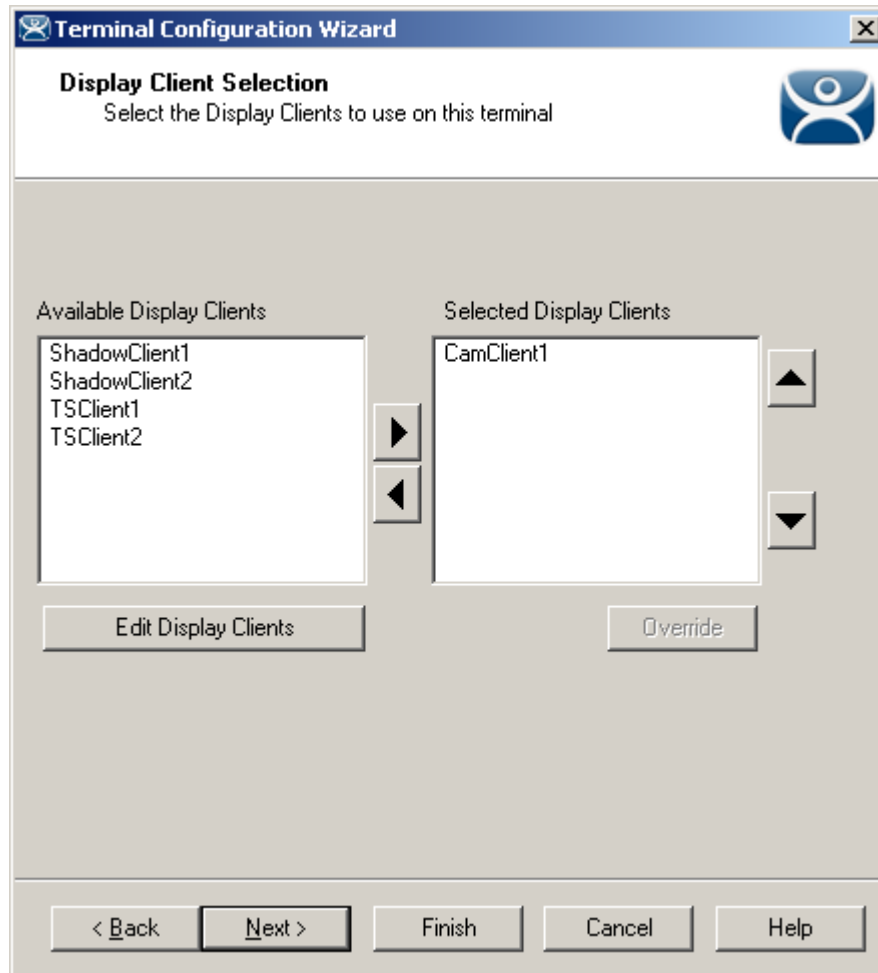
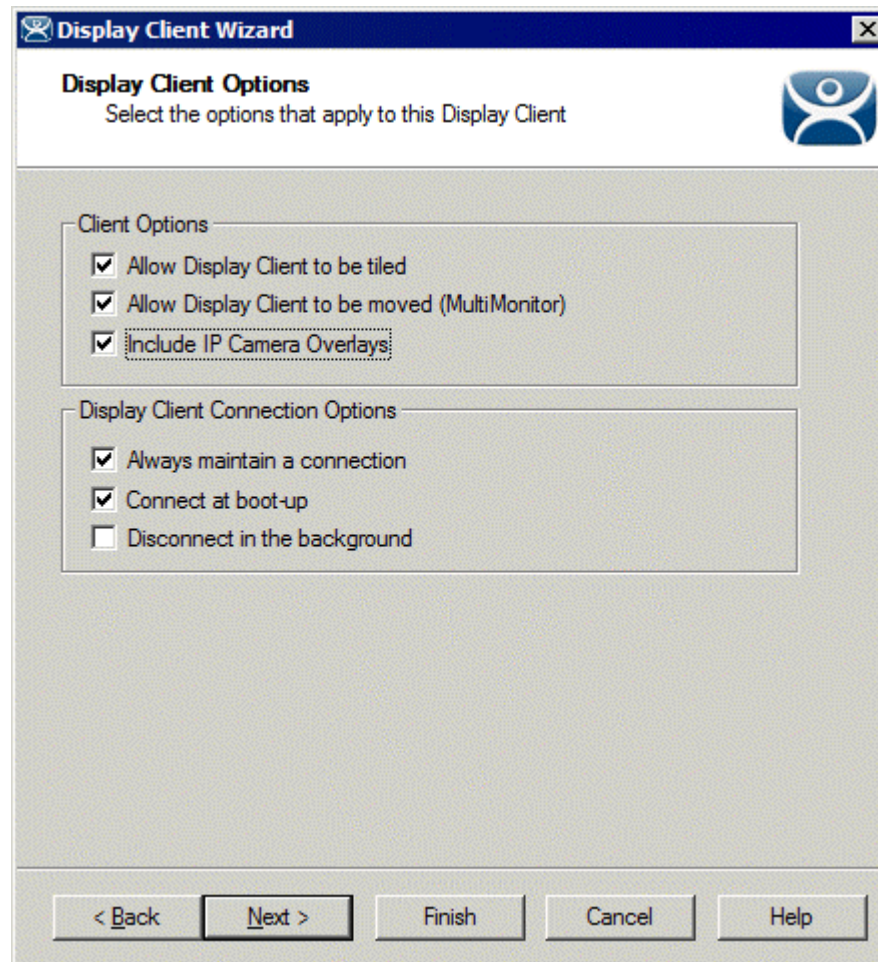*Terminal Configuration Display Client Selection*

During the terminal configuration, select the desired Display Clients for the terminal. Multiple Display Clients can be added to the configuration for a MultiSession configuration.

Camera Display Client Terminal Tree View

When the terminal is running, the Camera Display Client status will be reflected in the ThinManager terminal tree view. The status of each Camera Overlay and Camera will be displayed. A green lightning bolt on the Display Client icon represents that Display Client is in the foreground. A yellow lightning bolt on the Display Client icon represents that the Display Client is in the background. A green lighting bolt on the overlay icon represents an active overlay. A green lightning bolt on the camera icon represents an active connection to the camera.

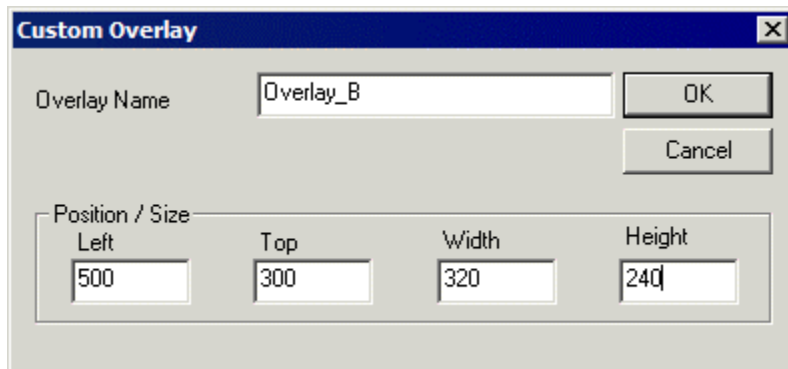## 13.3.2 Adding a Camera Overlay to a Display Client

Terminal Configuration Display Client Options

During the terminal configuration check the **_Include IP Camera Overlays_** option to add camera overlays to a Display Client.
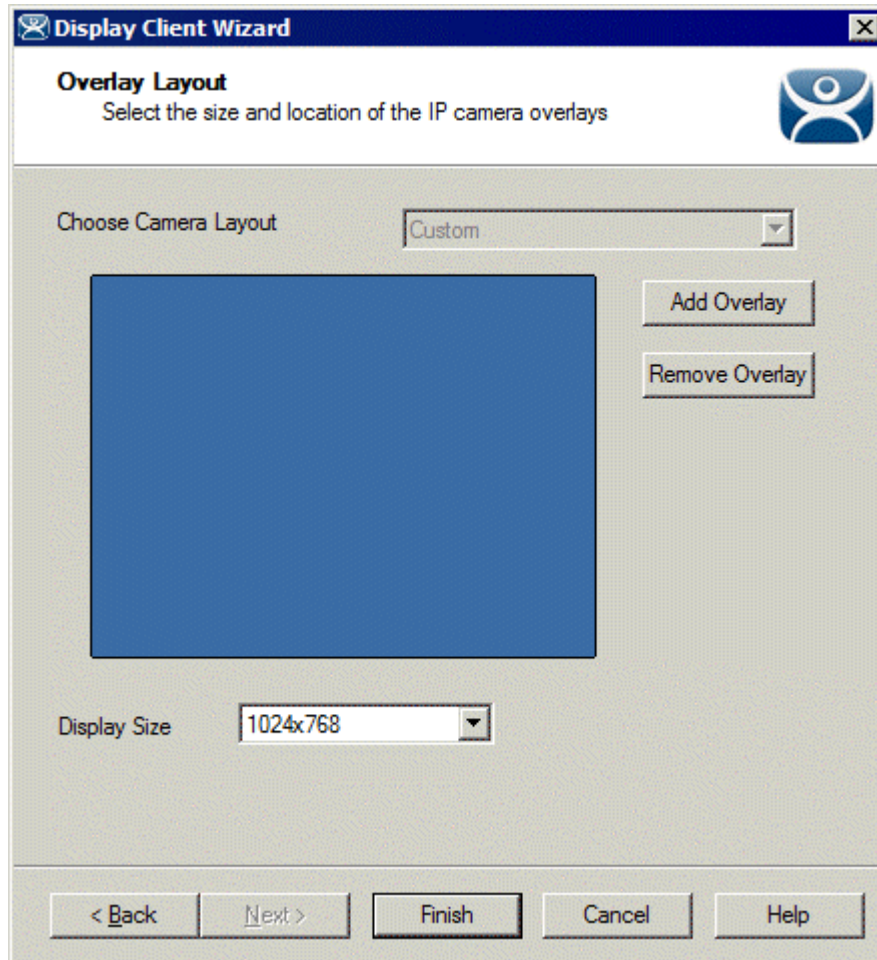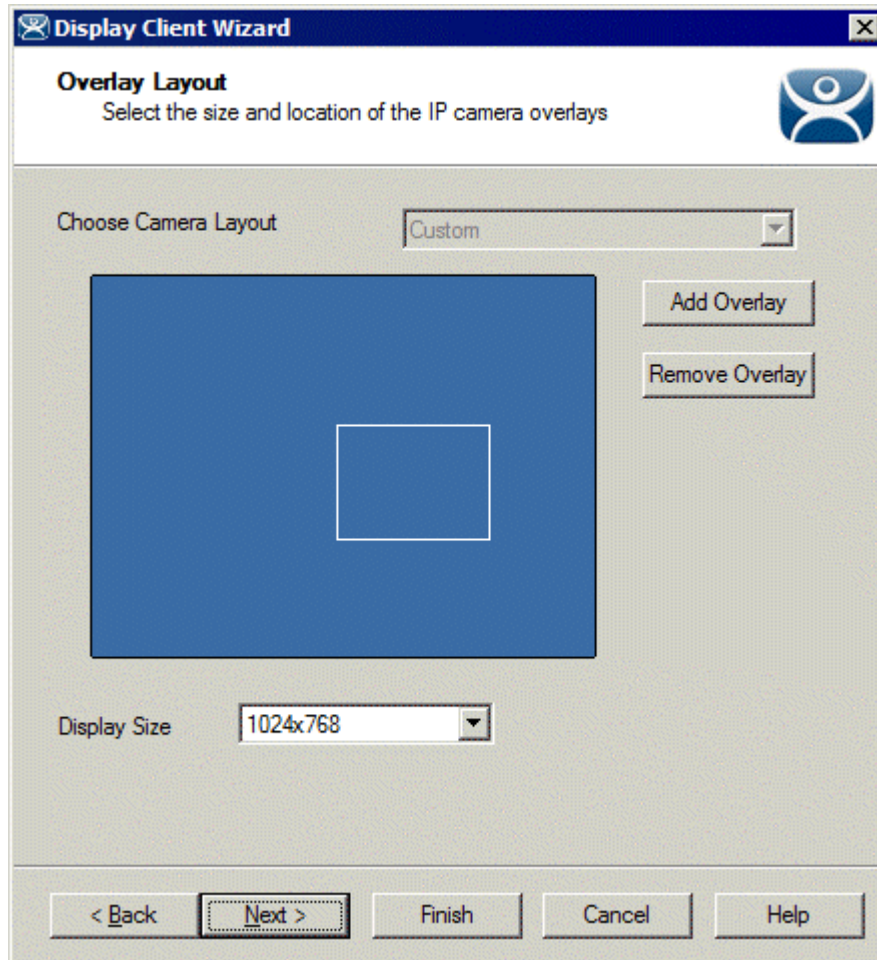
Terminal Configuration Overlay Layout

Camera Overlays can be configured before completing the Terminal Configuration wizard,
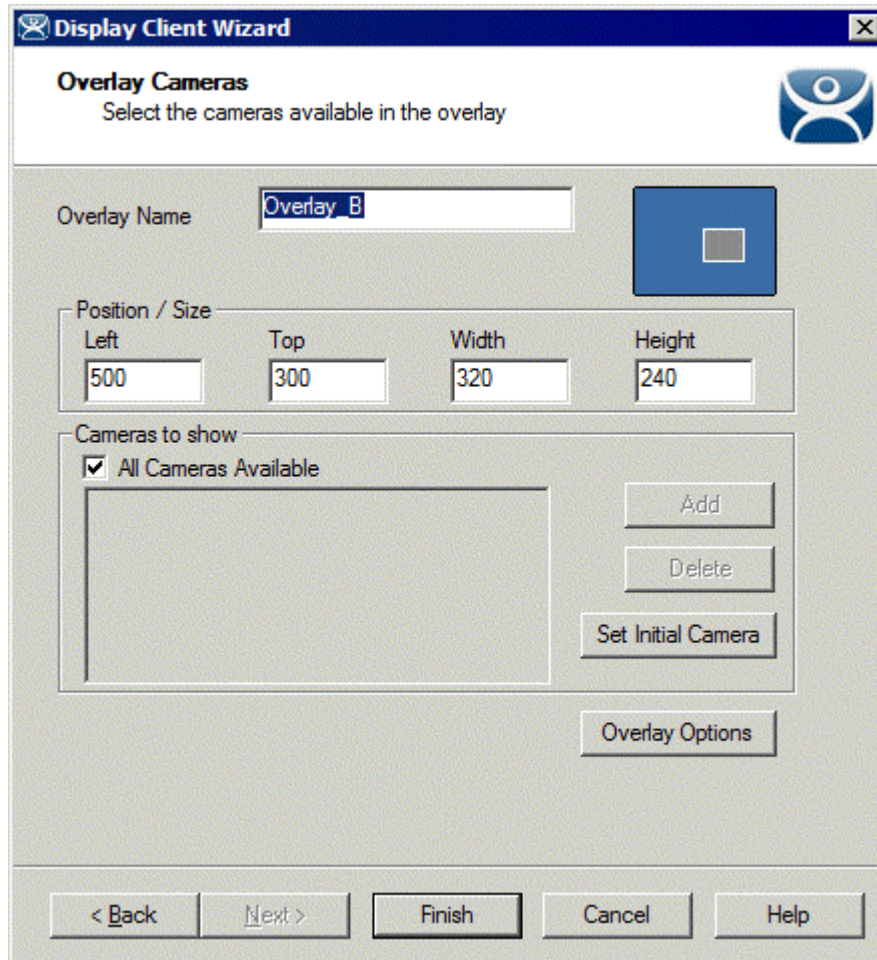

Terminal Configuration Add Camera Overlay

Clicking the **Add Overlay** button will allow the creation of the overlay. Enter the name position and size of the desired overlay.

Camera Overlay Layout

Once an overlay has been added, it will be represented as a white outlined square on the layout page. Selecting the *Next* button will allow the completion of the configuration camera overlays

Overlay Camera Selection

The camera overlay configuration can be completed as described in the **IP Camera Display Server Configuration Wizard** section.

13.3.3 Camera Overlays and TermMon ActiveX Control

Camera Overlays can be controlled by an application by using the TermMon ActiveX Control. The Control can be used to perform operations such as switching cameras and changing the overlay size and position. See TermMon ActiveX for details.

13.4 Terminal Shadow Display Clients

Terminal Shadow Display Clients allow a terminal to shadow another terminal. The Shadow Display Client can contain a specific terminal or several terminals.

13.4.1.1   Group Name Page

Terminal Shadow Display Client - Group Name Page

Importance of Page: This page starts the configuration wizard, sets the name, and the type of Display Client.

Fields:

- **Group Name** – This field is used to name the Display Client.

Settings:

- *Type of Display Client* drop-down box selects the function of the Display Client.
    - o *Terminal Services* – This creates an Display Client that allows a terminal to connect to a terminal server, login, and run a session.
    - o *Terminal Shadow* – creates an Display Client that allows a terminal to be shadowed by another terminal.

Buttons:

- *Permissions* - The button will launch the **Permissions** window that allows Permissions to be set for TermSecure. This is discussed in Permissions.

Why Change from Default Settings: The group needs a name and a type assigned to it.

This section covers **Terminal Shadow** Display Clients. Configure the Display Client by selecting *Terminal Shadow* from the *Type of Display Client* drop-down after naming the group.

Select the *Next* button to continue.
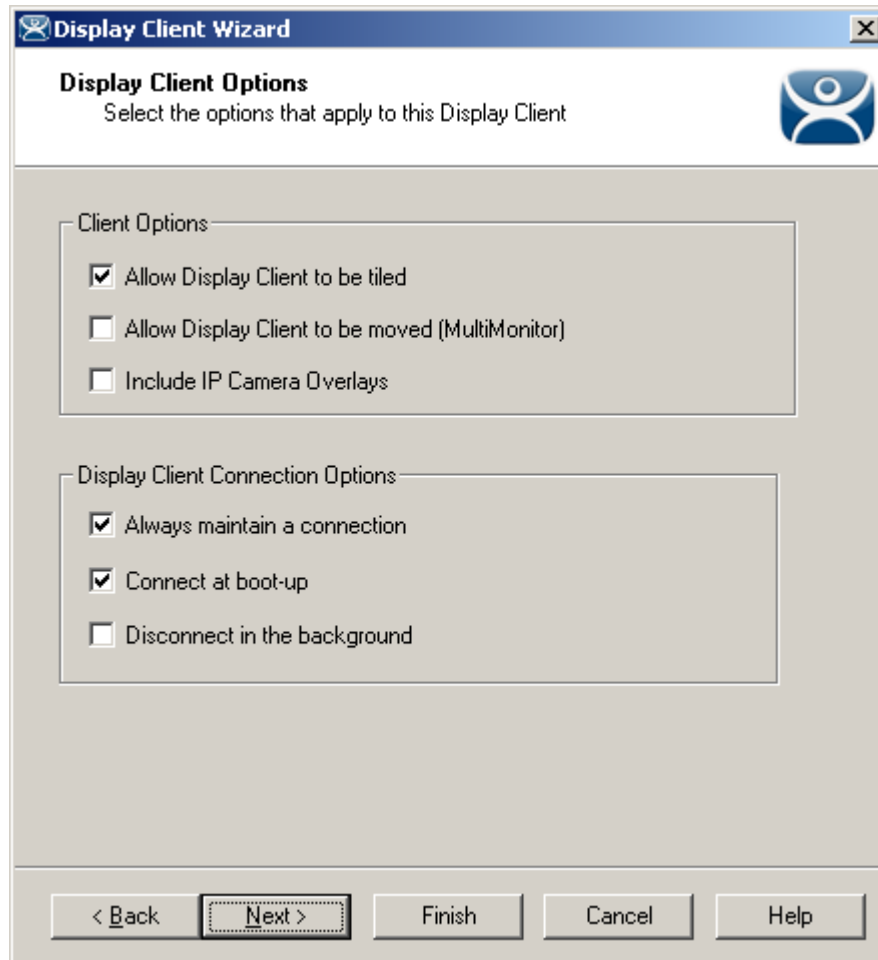
Terminal Shadow Display Client –Display Client Options

Importance of Page: This page allows the configuration of Display Client parameters

Checkbox:

- *Allow group to be tiled* – If checked, this allows the Display Client to be tiled in SessionTiling. See SessionTiling Options for details.

- *Allow Group to be moved (MultiMonitor)* – If checked, this allows a Display Client to be moved from one MultiMonitor screen to another. See MultiMonitor for details.

- **Include IP Camera Overlays** –This will allow IP Camera overlays to be added to this Display Client.

- *Always maintain a connection* – This keeps a session active, reconnecting and restarting if it is closed. If unchecked, the user can close a session and another session won't start automatically.

- *Connect at boot-up* – If checked, the terminal will start a session for this Display Client at boot up. If unchecked, a user action is required to start the session.

- *Disconnect in background* – If checked, a Display Client being used in a MultiSession configuration will disconnect once it is moved into the background. This could be done to require fewer resources.

Why Change from Default Settings: The *Always maintain a session for this group* and *Start a session at boot-up for this group* checkboxes, if unselected, will lower the demand on the terminal servers by allowing sessions to be closed until needed.

Select *Next* to continue, *Finish* to save and close, or *Cancel* to close without saving.

13.4.1.2   Terminal Shadow Display Client Page

The Terminal Shadow Display Client page allows the selection of the terminal or terminals to be shadowed.
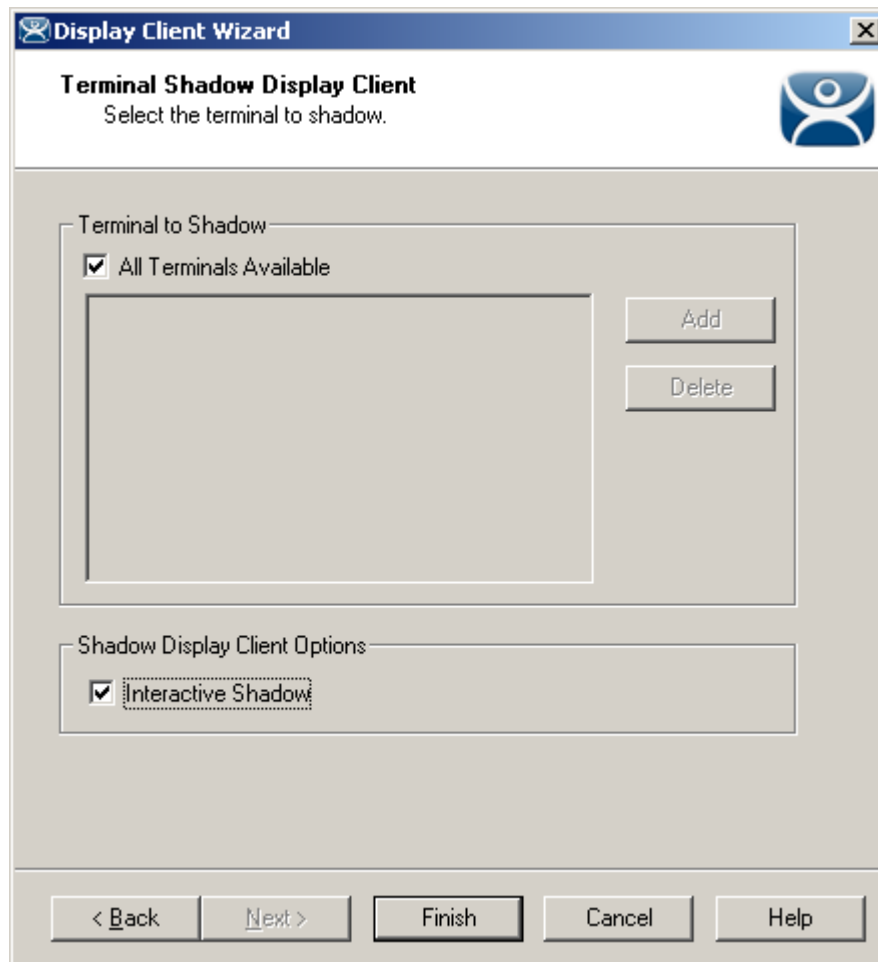
Terminal Shadow Display Client – All Terminals Available

Importance of Page: This page selects what terminals are available to be shadowed using Terminal-to-Terminal Shadowing.

Checkbox:

- **All Terminals Available** – This checkbox allows all terminals to be shadowed. Unselect it to limit Terminal-to-Terminal Shadowing to specific terminals.

- **Interactive Shadow –** This checkbox allows interactive shadowing of the terminals.

Fields:

- **Terminal to Shadow** – This list box shows the terminals available to shadow.

Buttons:

- **Add** – This button adds terminals to the Terminal to Shadow list box when *All Terminals Available* is unselected.

- **Delete** – This button deletes a highlighted terminal from the Terminal to Shadow list box *when All Terminals Available* is unselected.

Why Change from Default Settings: The default setting grants permission to shadow all of the terminals. Unselecting the *All Terminals Available* checkbox allows specific terminals to be added.

Additionally, multiple shadow groups can be created, each with a specific terminal or group of terminals.

By default the Shadow Group is configured to allow all terminals to be shadowed. Unselecting the *All Terminals Available* checkbox will allow the designation of specific terminals.
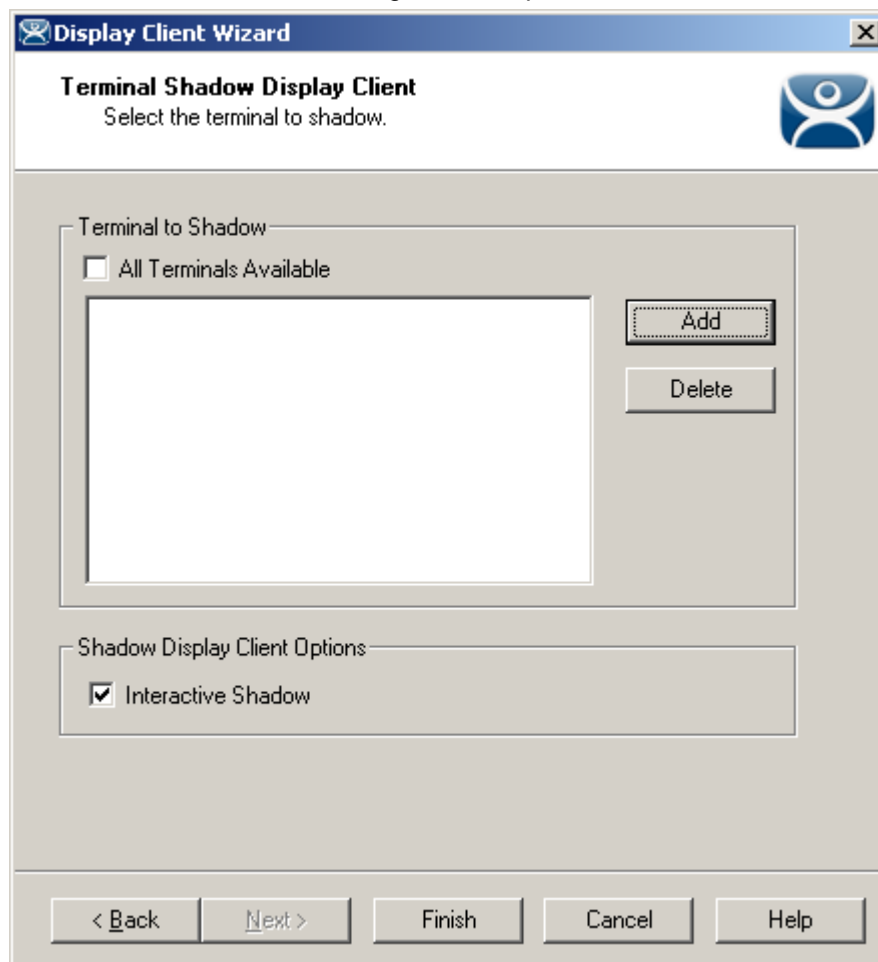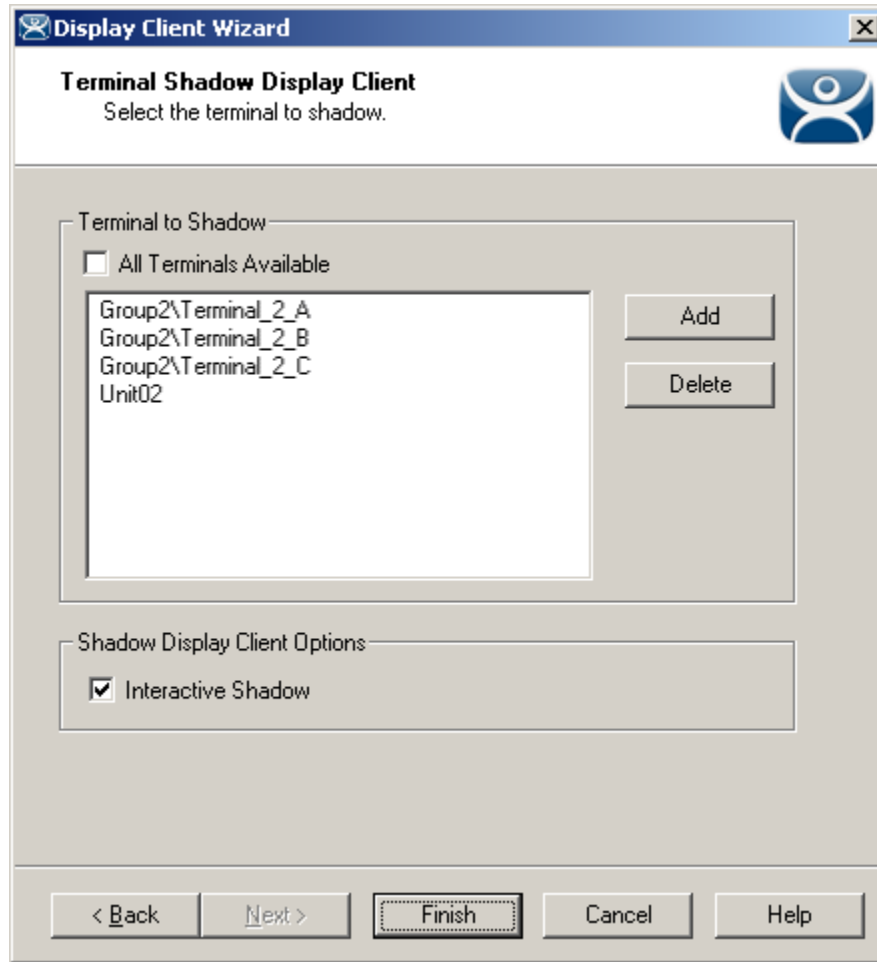

Terminal Shadow Display Client –Select Terminals

Select the *Add* button to launch the terminal selection window.
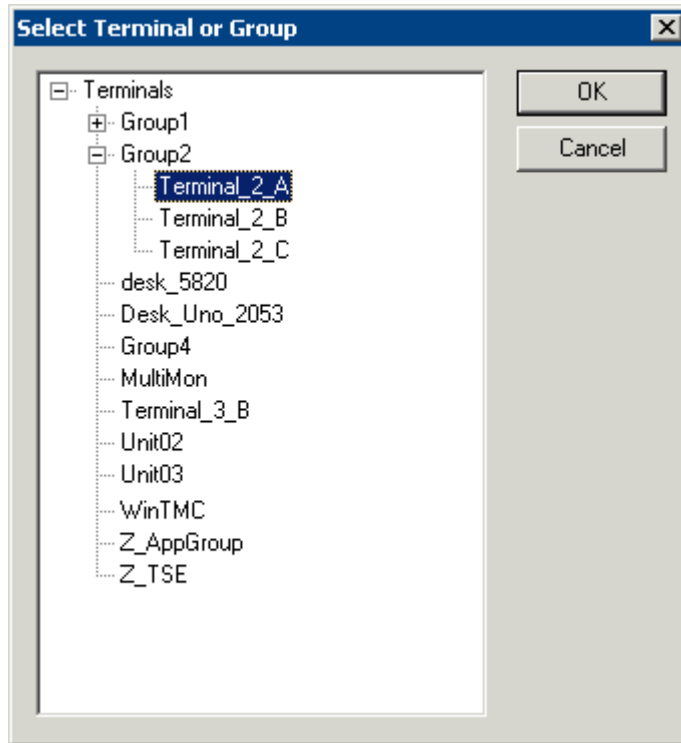
Select Terminal or Group Window

Select a terminal for shadowing by highlighting it in the **Select Terminal or Group** window and selecting the **OK** button. The window will close after each selection.

To add multiple terminals repeat the process by selecting the *Add* button on the **Terminal Shadow Display Client page**.

*Terminal Shadow Display Client – Selected Terminals*

The Terminals to Shadow textbox will display the terminals added to the list.
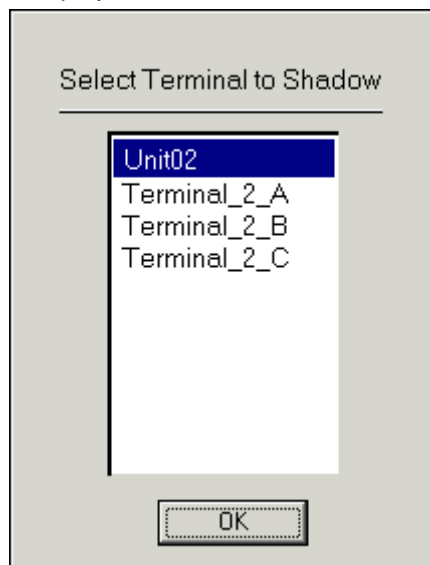
Terminal Selector

When a terminal launches a Shadow Display Client that has multiple members a **Select Terminal to Shadow** window will be displayed to allow the selection of the terminal to shadow. Highlight the desired terminal and select the *OK* button.

13.4.1.3   Display Client List Window
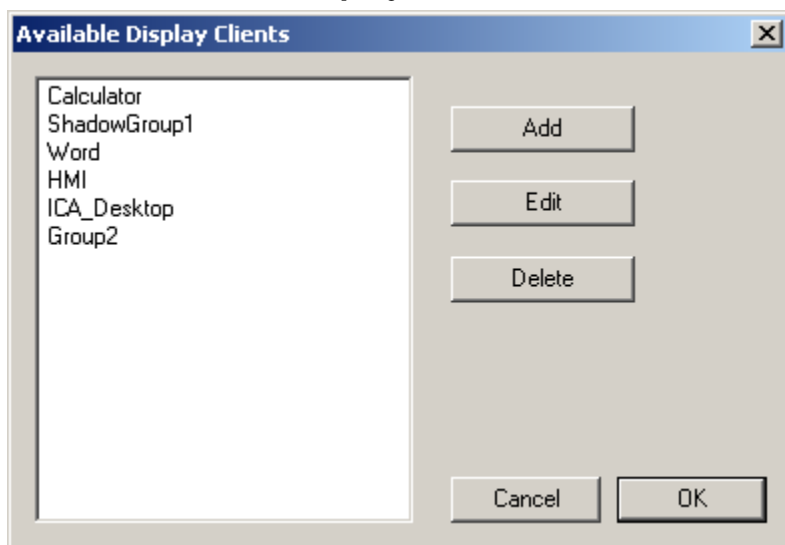
Available Display Clients

After an Display Client is configured the Display Client List will show configured Display Clients.

Additional groups can be configured by selecting the *New Group* button.

The **Display Client List** wizard can be closed by selecting *OK*.