

13 Failover and Instant Failover

13.1 Failover Introduction

ACP uses specific terms to cover different topics that are concerned with keeping data viable during computer failure.

Replacement: If a terminal fails or is destroyed, the session stays active on the terminal server while the thin client is replaced. This is covered in Adding Thin Client Hardware.

Failover: Failover is the ability to switch between multiple terminal servers if a terminal server fails. This is built in to every ThinManager System and ThinManager Ready thin client. This is covered in Failover.

Instant Failover: Instant Failover is the ability of ThinManager Ready thin clients to connect and login to two terminal servers simultaneously. This allows applications to be pre-loaded so that a failure to one terminal server causes minimal impact because the terminal will quickly switch to an existing session. This is covered in Instant Failover.

Redundancy: Redundancy refers to multiple ThinManager Servers. ThinManager Ready thin clients are not dependent on ThinManager after booting and will continue to run if the ThinManager Server fails. However, rebooted terminal will wait until the ThinManager Server is restored until it boots and receives its configuration. For this reason many people use a backup, or Redundant ThinManager Server. This is covered in Redundancy Overview.

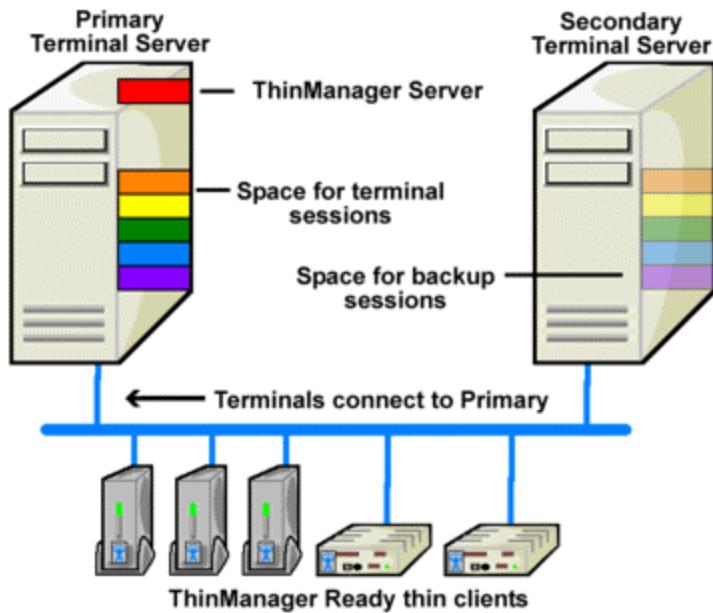
13.2 Failover

Every ThinManager Ready thin client has the ability to switch between multiple terminal servers if a terminal server fails. Each thin client has a program that monitors its terminal server. If the terminal server fails to respond to the terminal, it will drop the broken connection and connect to a backup terminal server, allowing it to continue to function.

Failover requires:

- Two or more terminal servers
- Identical Microsoft user accounts on each, or domain permissions on both
- Identical applications on each, with the same path, to make life easier

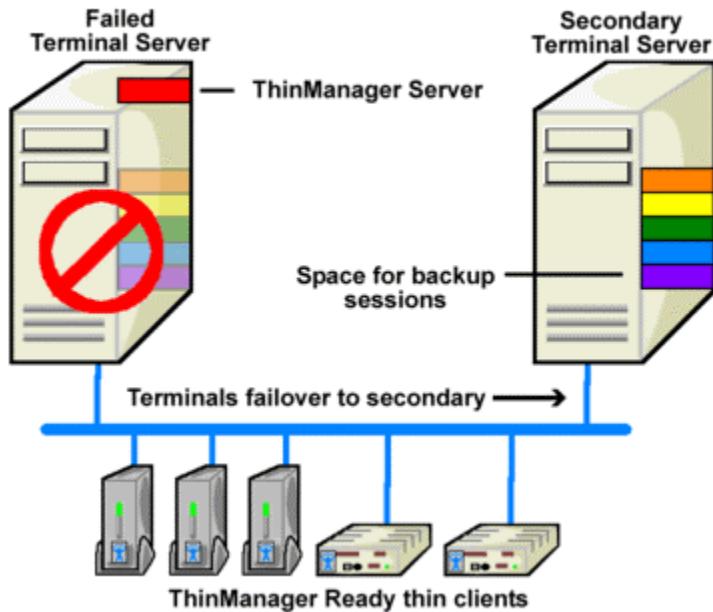
Failover without Redundancy



Simple Failover - Before Failure

This shows a pair of terminal servers, one used as the primary with the terminals connected and running sessions, and a second terminal server as the backup, or secondary terminal server.

Failover without Redundancy



Simple Failover, After Failure

This shows the results of a failure of the primary terminal server. The thin clients would detect the failure and switch to the secondary terminal server where they would login and continue running.

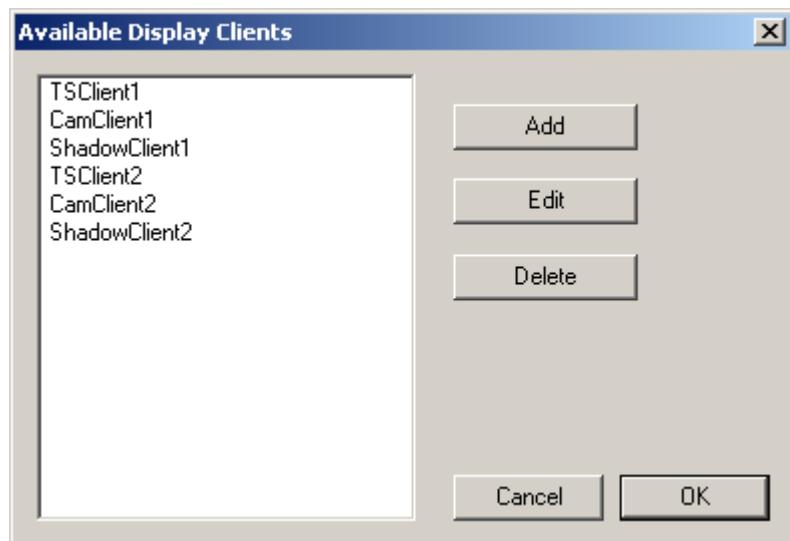
Note: This does not synchronize the hard drives. Failover gives you the ability to continue to run the thin client by connecting to a backup. Data pulled from an outside source like a PLC or file server would be the same on either terminal server.

13.2.1 Failover Setup For a Terminal Using Terminal Services Display Clients

Failover is configured in the Terminal Configuration Wizard. It is configured differently when using individual terminal servers and Display Clients.

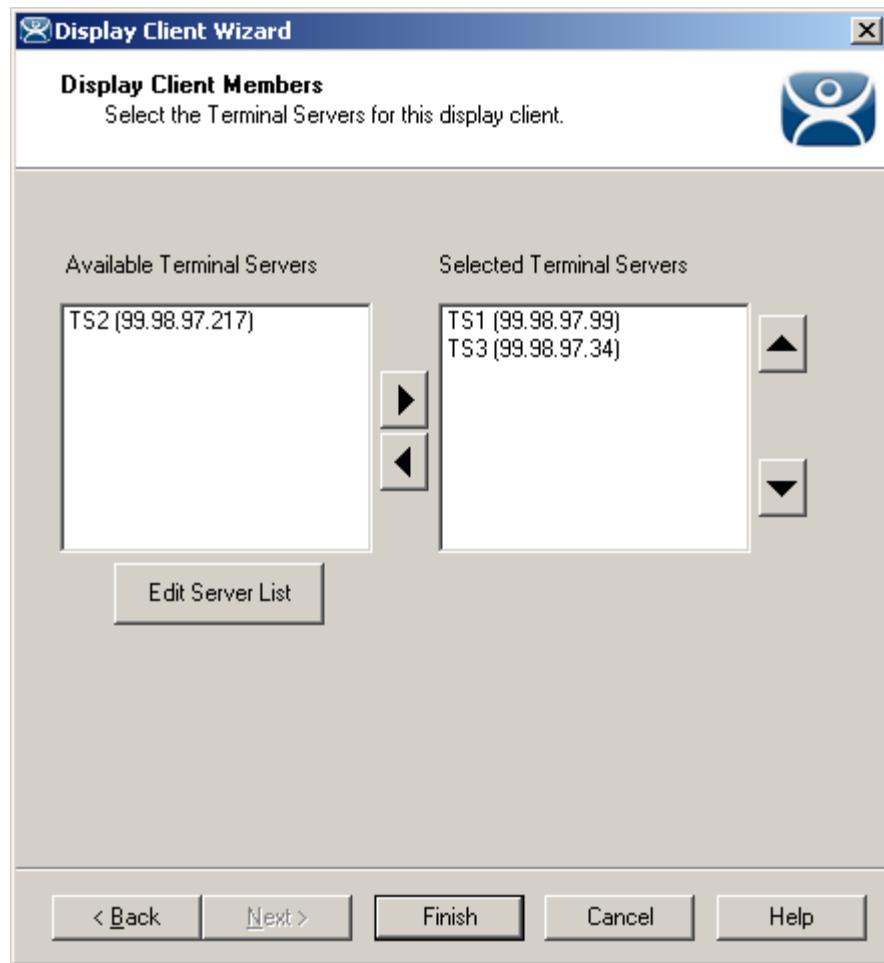
Terminal Services Display Clients allow a terminal to run a session from a list of terminal servers. The Display Client will have Failover capability if two or more terminal servers added to it. This is configured in the Terminal Services Display Client Wizard.

Launch the Display Client Wizard by right clicking on the Display Clients branch in the tree. Alternatively, you can right click on an existing Terminal Services Display client in the tree and select **Modify**.



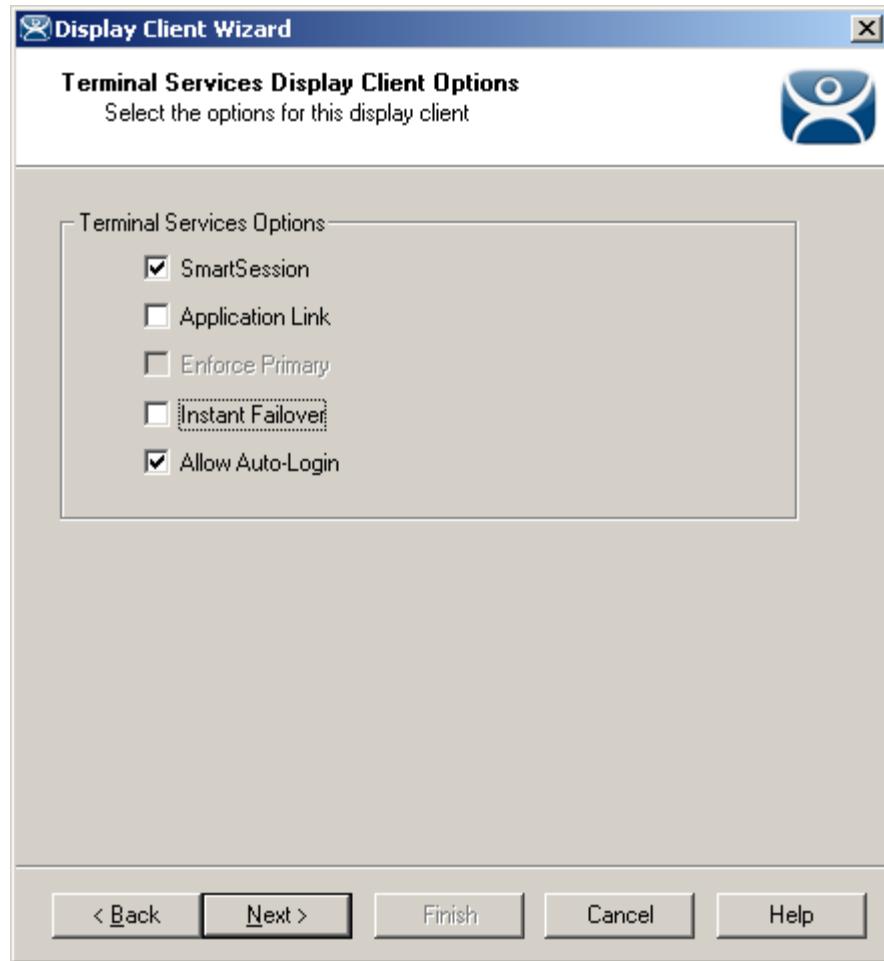
Display Client List

Select the **Add** button to add a new Display Client, or highlight an existing Terminal Services Display Client and select the **Edit** button to edit an existing Display Client.



Application Group Wizard - Application Group Members

Member terminal servers are added on the Display Clients Members page. Adding two or more terminal servers to the **Selected Terminal Servers** field will enable failover. The terminal will connect to the terminal servers in the order given, unless the Display Client is using SmartSession.



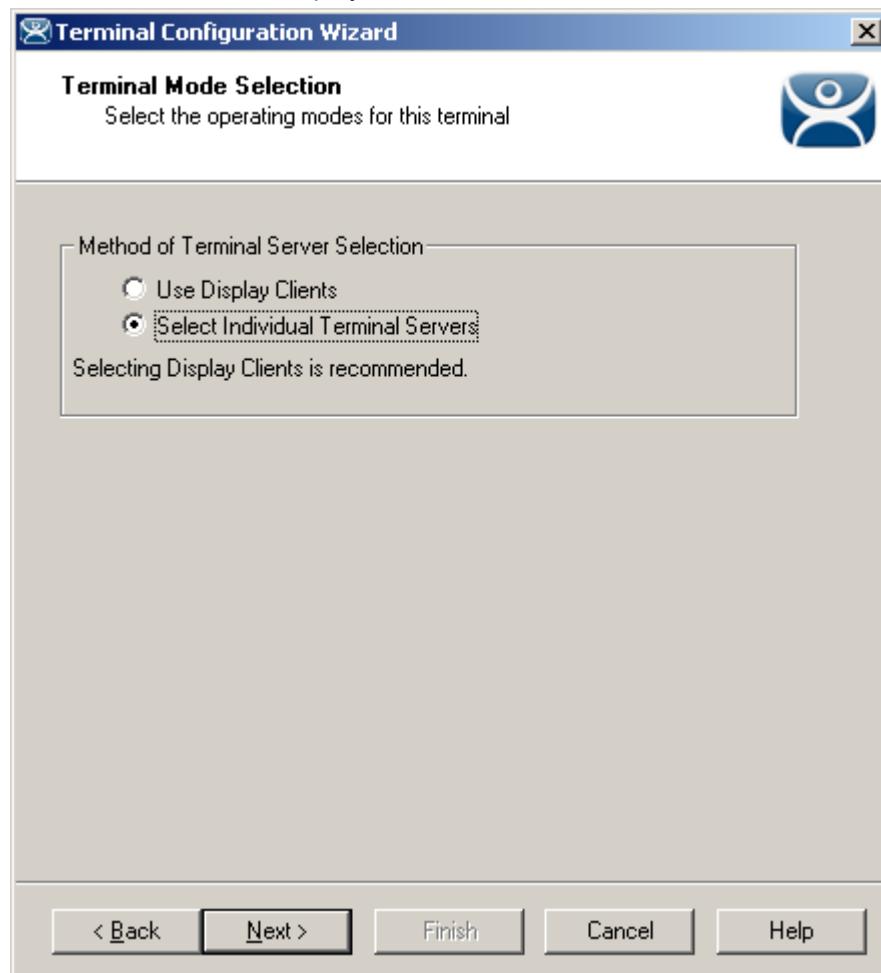
Terminal Services Display Client Options

SmartSession uses the CPU usage, Memory usage, and the number of sessions on a terminal server to determine its load. Terminals using Terminal Services Display Clients with SmartSession will start a session on the server with the lightest load, instead of the order listed.

Selecting the **SmartSession** checkbox on the **Display Client Options** page of the **Display Client Wizard** configures SmartSession. When SmartSession is used the **Enforce Primary** checkbox is no longer relevant.

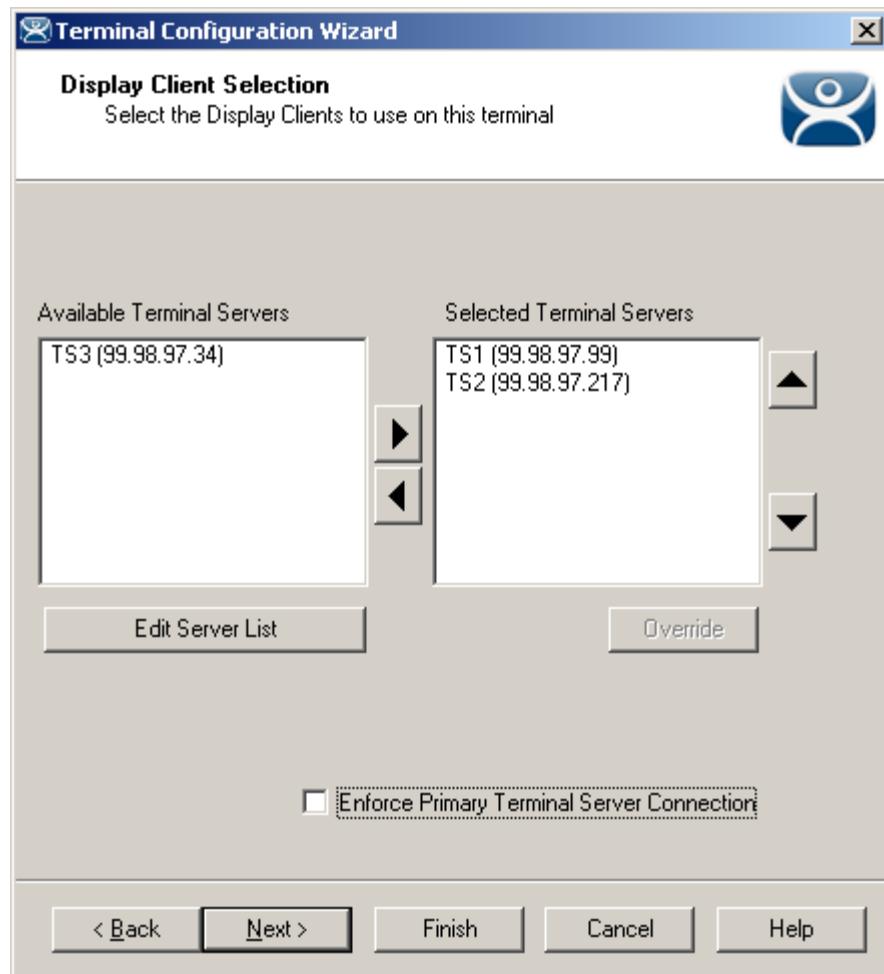
13.2.2 Failover Setup For a Terminal Using Individual Terminal Servers

Failover is configured in the Terminal Configuration Wizard. It is configured differently when using individual terminal servers and Terminal Services Display Clients.



Terminal Configuration Wizard - Select Individual Servers

If individual terminal servers are to be used, select the **Select Individual Terminal Servers** radio button on the **Terminal Server Selection** page.



Terminal Configuration Wizard - Terminal Server Selection

Configure failover on the Terminal Server Selection page by adding two or more terminal servers in the **Selected Terminal Servers** field. Upon boot up, the terminal will connect to the first terminal server in the list, considered the primary terminal server. If the primary fails, the terminal will connect to the next terminal server in the list. The terminal will use each of the terminal servers in the list, if needed.

The **Enforce Primary Terminal Server Connection** checkbox will keep the terminal monitoring the first terminal server in the list, even if it has failed. If the terminal detects that the primary terminal server is back on line, it will drop its connection to the backup and reconnect to the primary terminal server.

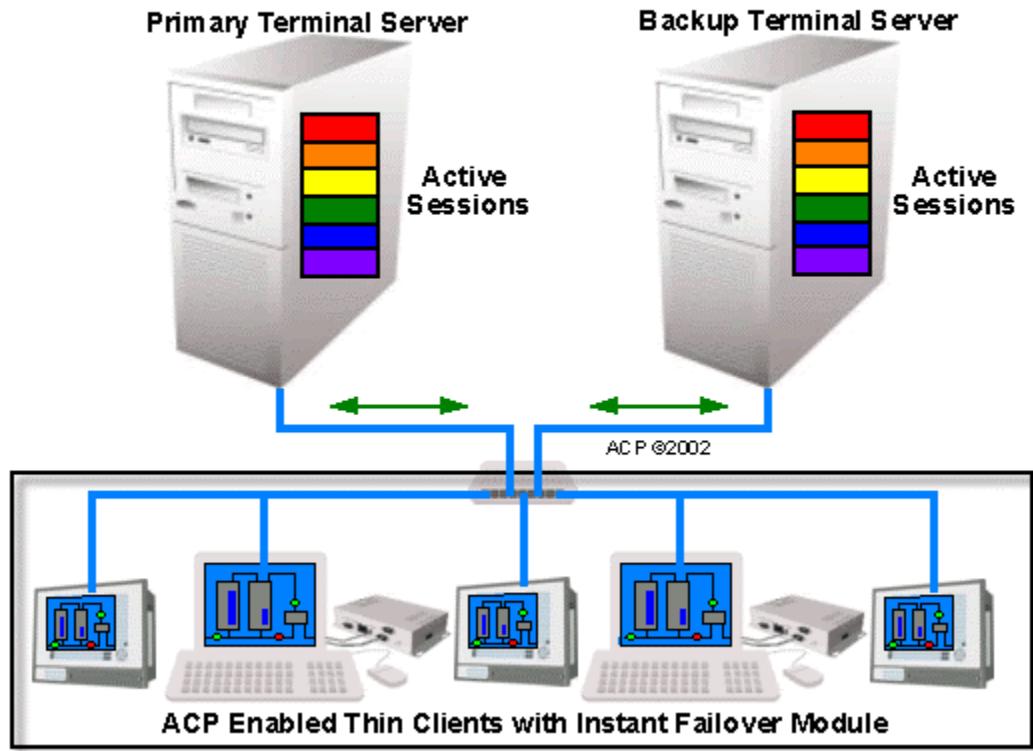
13.3 Instant Failover

Basic failover is built into every ThinManager Ready thin client. Detecting that the primary server is down and connecting to a backup server is usually achieved in 10 to 20 seconds, depending on the monitoring configuration. Some applications will need additional time to launch and initialize the programs. Instant Failover was developed for people who need the session to switch to another terminal server and start running immediately, without any delays for starting the applications.

When using Instant Failover, the ThinManager Ready thin client starts sessions on two servers at once. The sessions are cascaded on the thin client, with the primary session on top. If the primary terminal server fails, the preexisting secondary session is switched to the forefront.

Instant Failover - Part 1

Terminals with Instant Failover module login to two terminal servers at once

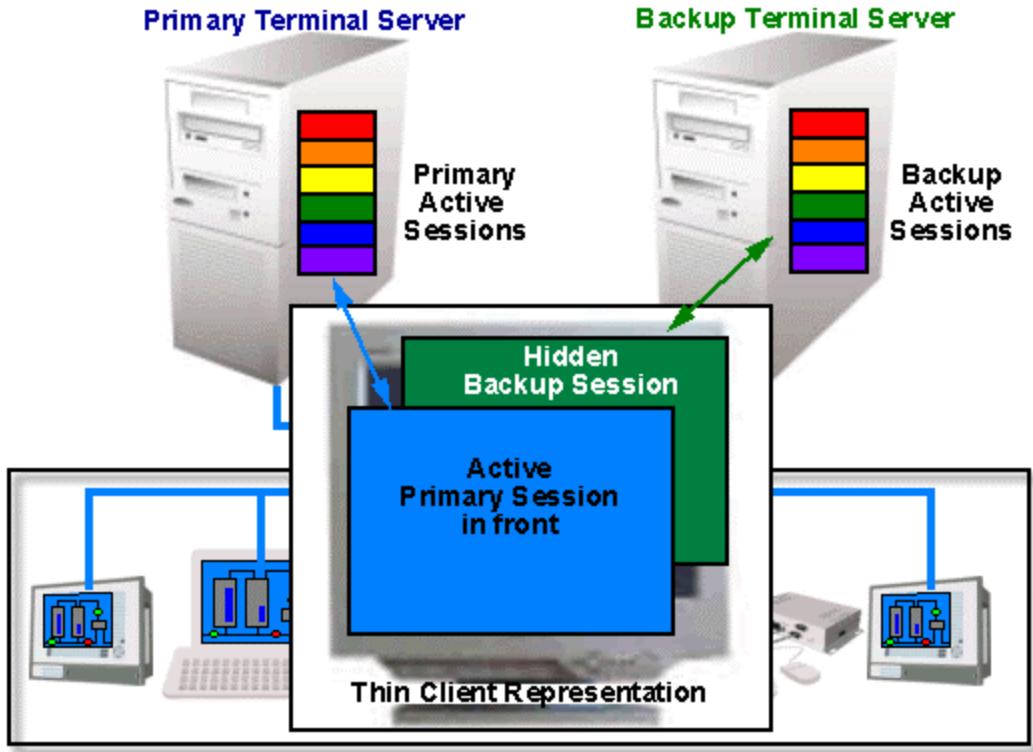


Instant Failover, Part 1

When a ThinManager Ready thin client using Instant Failover boots, it connects to two terminal servers, logs in, and starts two sessions.

Instant Failover - Part 2

Terminals run both sessions
The active Primary session is cascaded to hide Backup session

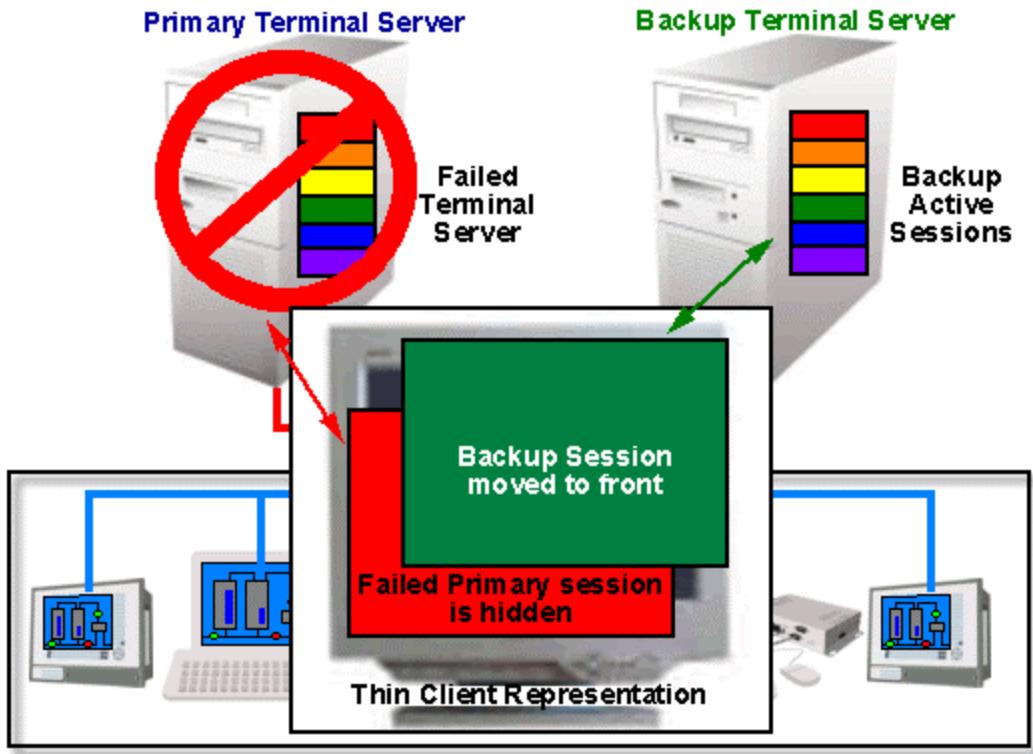


Instant Failover, Part 2

The thin client cascades both sessions and displays the primary session in front. You cannot see the secondary session as it is hidden in back. There is an optional hot key toggle available to allow toggling between sessions. See Hotkey Configuration for details.

Instant Failover - Part 3

If the Primary fails, the terminal will toggle the cascaded windows, displaying the Backup session in front



Instant Failover, Part 3

If the primary server fails, the thin client monitoring program will detect its failure. The thin client will then switch the focus of the window, showing the secondary session. This session is already initialized so the user is able to proceed at once.

Note: Use a *Username*, *Password*, and *Initial Program* to allow the ThinManager Ready thin client to login automatically and start a program so that the background session is immediately ready and not needing a login and program launch.

If the **Enforce Primary** feature is used, the thin client will switch back to the primary once it is back online.

Note: ThinManager Ready thin clients that use instant failover may require 64 MB of memory.

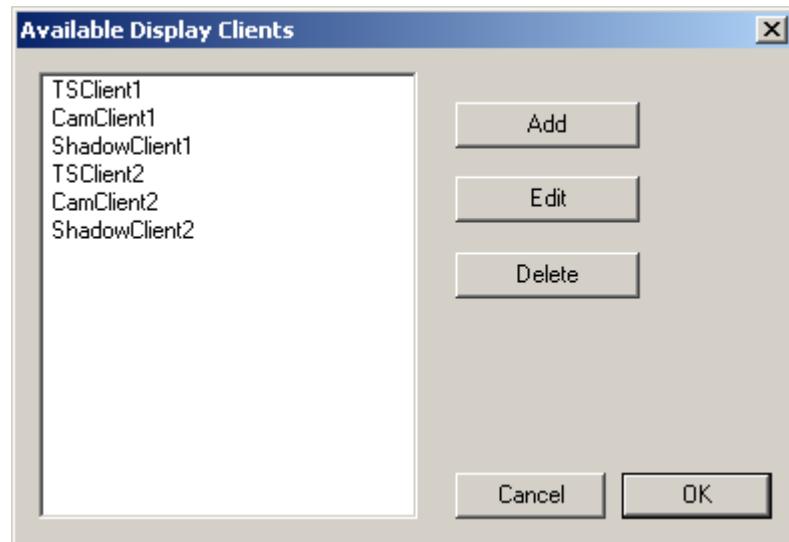
13.4 Instant Failover Configuration

Instant Failover is configured as part of Terminal Services Display Clients if Display Clients are used or added as a module if the ThinManager Ready thin client is using individual terminal servers.

13.4.1 Instant Failover Setup using Terminal Services Display Clients

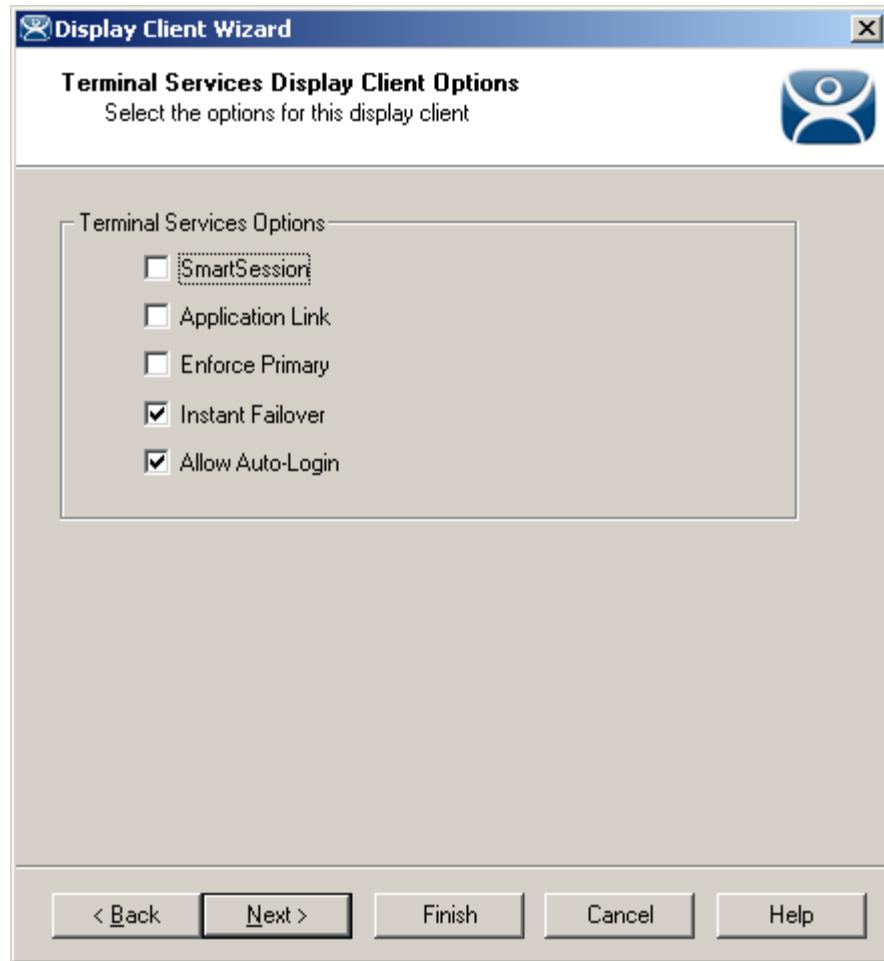
Terminal Services Display Clients allow a terminal to run a session from a list of terminal servers. The Display Client will have Instant Failover capability if two or more terminal servers added to it and the Instant Failover option is selected. This is configured in the Terminal Services Display Client Wizard.

Launch the Display Client Wizard by right clicking on the Display Clients branch in the tree. Alternatively, you can right click on an existing Terminal Services Display client in the tree and select **Modify**.



Display Client List

Select the **Add** button to add a new Display Client, or highlight an existing Terminal Services Display Client and select the **Edit** button to edit an existing Display Client.



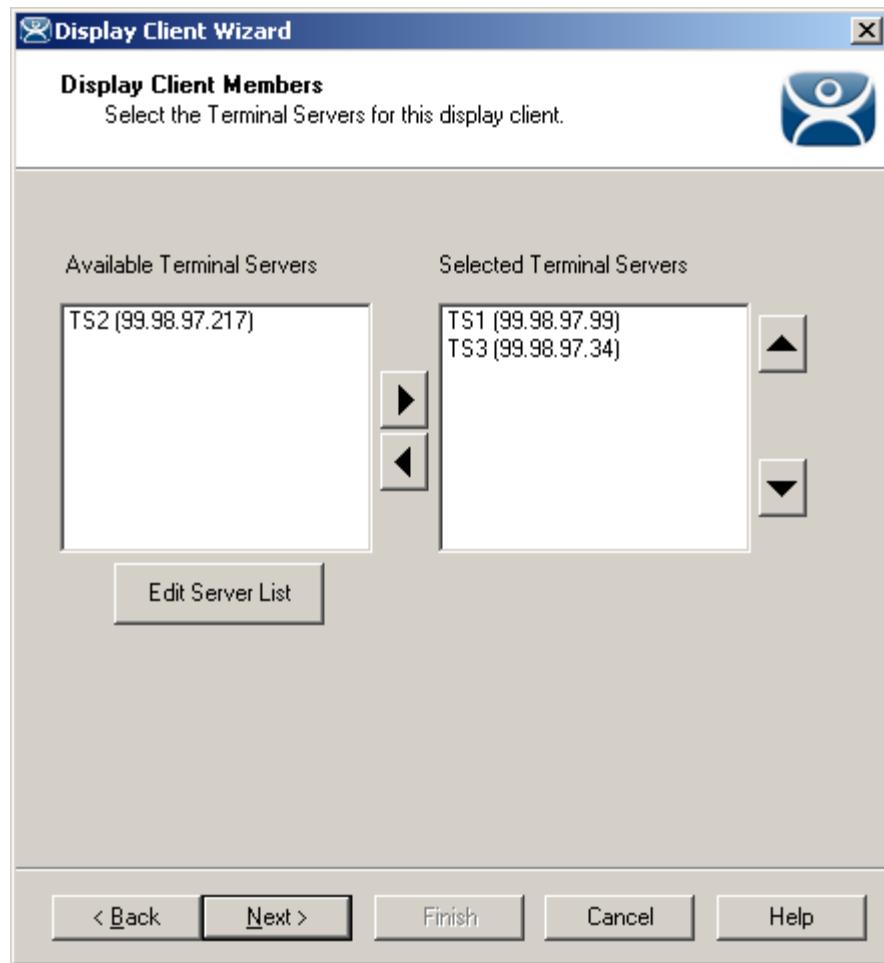
Display Client Wizard – Terminal Services Options Page

Select the **Instant Failover** check box on the **Display Client Options** page to enable instant failover for the Display Client.

Note: Do not use the Instant Failover Module when using Instant Failover within a Display Client

The Terminal Services Options page allows the configuration of other parameters in addition to the Instant Failover such as SmartSession and AppLink. See the Terminal Services Display Client Options for details.

Each Terminal Services Display Client needs two or more terminal servers to get Instant Failover to function. This is done on the **Display Clients Members** page of the Display Client Wizard.



Display Client Wizard – Display Client Members Page

Select two or more terminal servers from the **Available Terminal Servers** list and move them to the **Selected Terminal Servers** list by highlighting and double clicking, or by using the **Arrow** button.

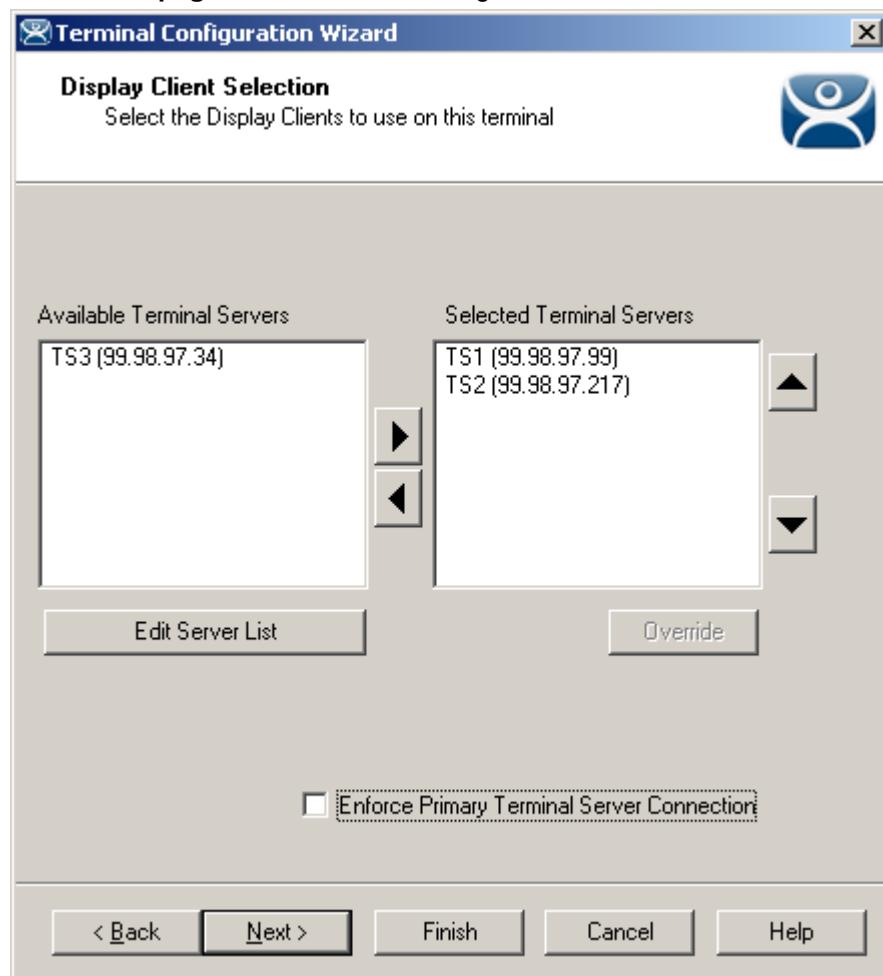
The thin client will start sessions on the top two terminal servers in the **Select Terminal Server** list, with the top terminal server as the primary and the second terminal server as the backup, unless SmartSession was chosen on the Group Options page.

If more than two terminal servers are selected, the thin client will connect to the other terminal servers if one of the other terminal servers fails.

13.4.2 Instant Failover Setup using Individual Terminal Servers

The Instant Failover Module initiates instant Failover if a ThinManager Ready thin client is using individual terminal servers.

Run the **Terminal Configuration Wizard** for the terminal or Group that needs instant failover and proceed to the **Display Client Selection** page of the Terminal Configuration Wizard.



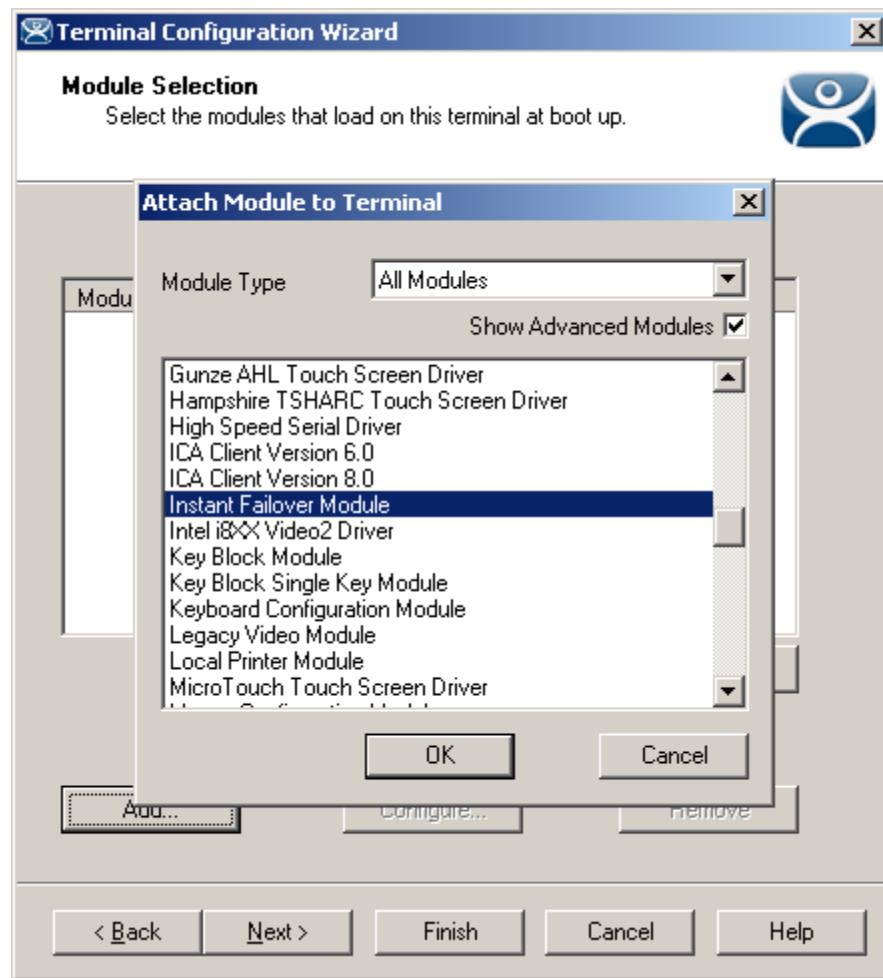
Terminal Configuration Wizard – Terminal Server Selection Page

Select two or more terminal servers from the **Available Terminal Servers** list and move them to the **Selected Terminal Servers** list by highlighting and double clicking, or by using the **Arrow** buttons.

When Instant Failover is initiated the thin client will start sessions on the top two terminal servers in the **Select Terminal Server** list, with the top terminal server as the primary and the second terminal server as the backup.

If more than two terminal servers are selected, the thin client will connect to the other terminal servers if one of the other terminal servers fails.

Proceed to the **Module Selection** page of the **Terminal Configuration Wizard** to add the Instant Failover module.



Module Selection Page - Attach Module to Terminal Window

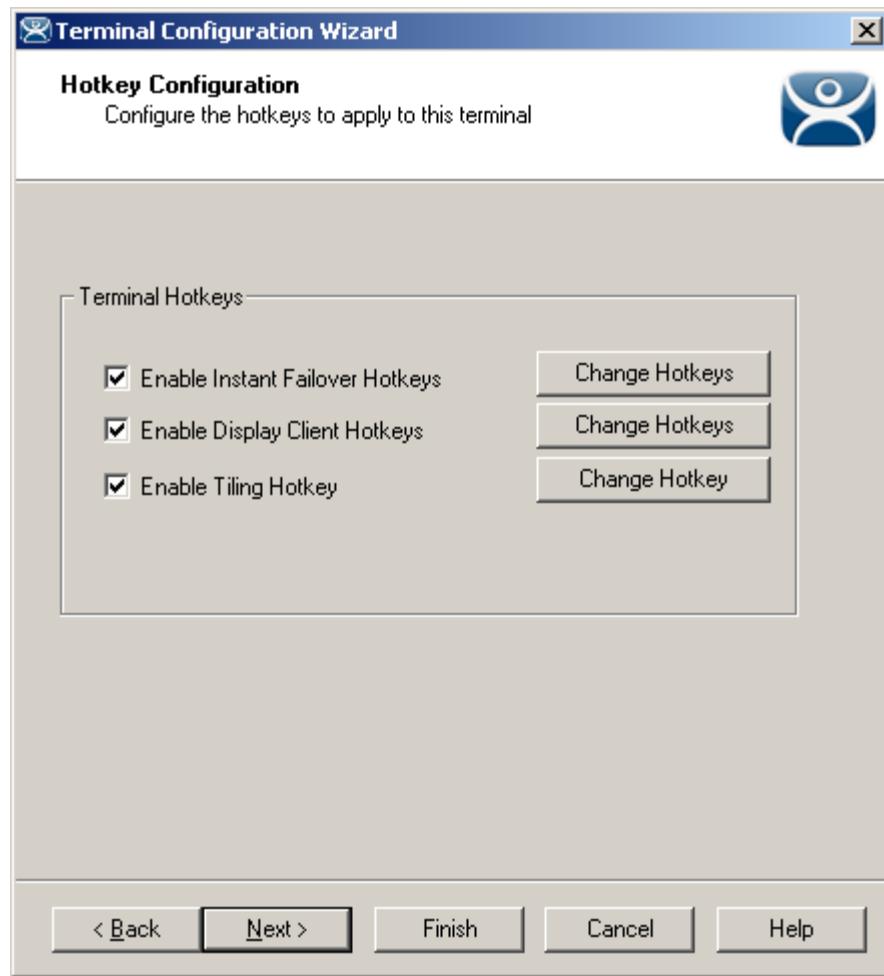
On the Module Selection page of the Terminal Configuration Wizard, select the **Add** button to launch the **Attach Module to Terminal** window. Highlight the **Instant Failover Module** and select **OK**. This will apply Instant failover to the terminal when it reboots.

13.4.3 Switching Between Instant Failover Sessions

Instant Failover can be configured to allow a user to toggle between the two instant failover sessions. This is done differently when using individual terminal servers and Display Clients.

13.4.4 Switching Between Sessions with Display Clients

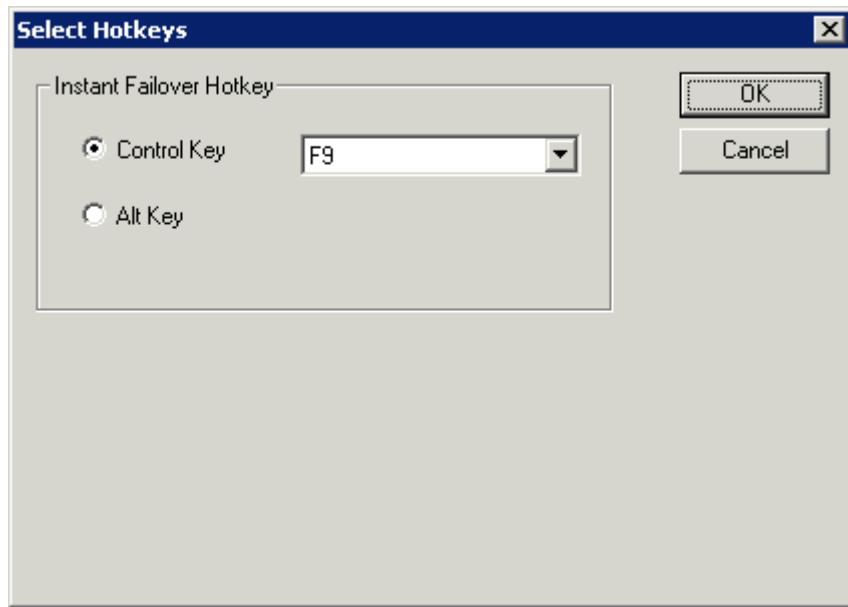
Instant Failover can be configured to allow a user to toggle between the two instant failover sessions when the thin client is using Display Clients by using a hotkey. To configure the hotkey run the Terminal Configuration Wizard for the terminal or terminal group that is using a Terminal Services Display Client with Instant Failover and proceed to the **Hotkey Configuration** page.



Terminal Configuration Wizard – Hotkey Configuration Page

When a thin client is using Terminal Services Display Clients, selecting the **Enable Instant Failover Hotkeys** check box will allow the user to switch between instant failover sessions using the default **CTL + F9** hot key.

The default hotkey can be changed by selecting the upper **Change Hotkeys** button and launching the **Select Hotkeys** windows.

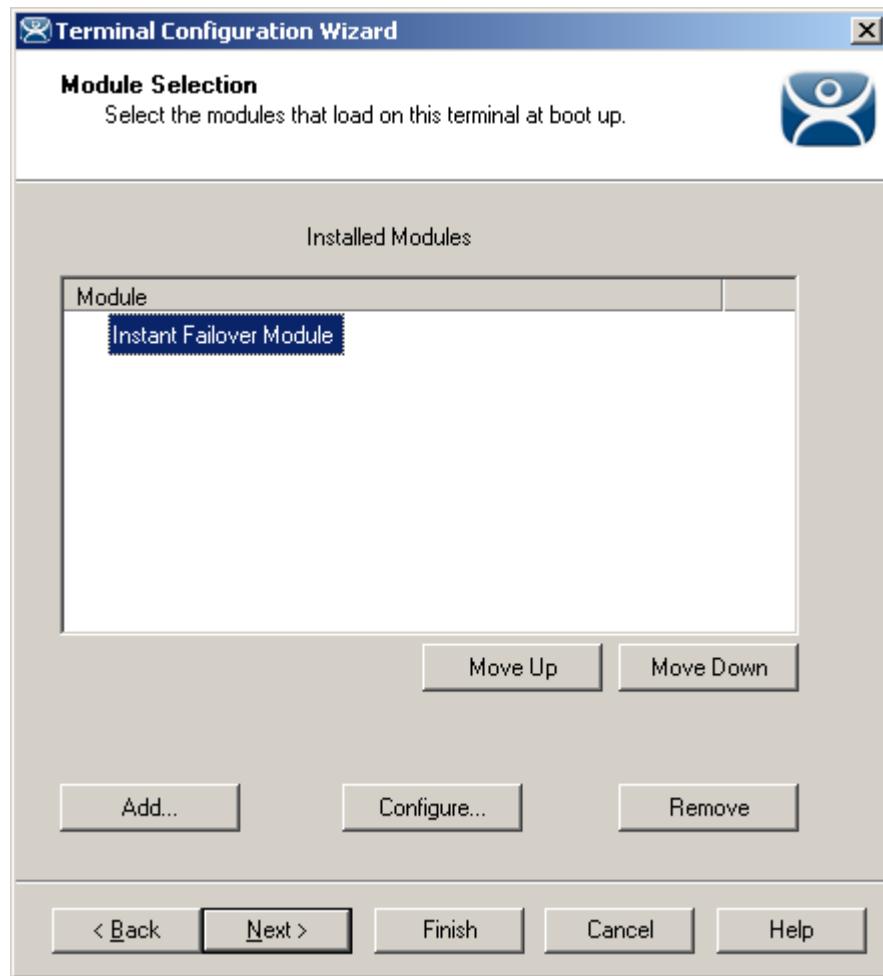


Select Hotkeys Windows

The hot keys needed to switch between instant failover sessions can be changed on the **Select Hotkeys** window. Select the **Control Key** or **Alt Key** radio button and a **function key** from the drop down box and select the **OK** button to accept the changes.

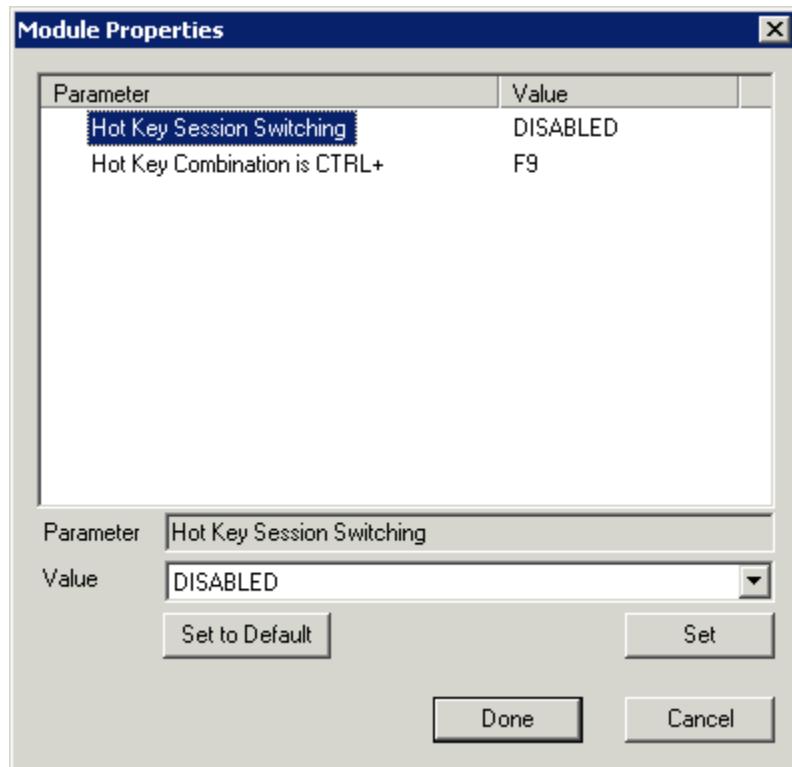
13.4.5 Switching Between Sessions using Individual Terminal Servers

Instant Failover can be configured in the Instant Failover Module to allow a user to toggle between the two instant failover sessions when the thin client connects to individual terminal servers. Run the **Terminal Configuration Wizard** for the thin client or Group that needs instant failover and proceed to the **Module Selection** page. See Instant Failover Module for details.



Terminal Configuration Wizard - Module Selection Page

Highlight the Instant Failover Module and select the **Configure...** button to launch the **Module Properties** window.



Module Properties Window

To enable hot key switching between sessions, highlight the **Hot Key Switching** parameter, select the **Enabled** value from the **Value** drop down and select the **Set** button.

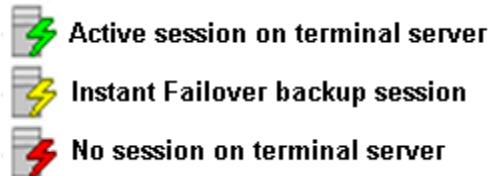
The hot key combination can be changed by selecting the **Hot Key Combination is CTRL+** parameter, changing the key in the **Value** drop down and selecting the **Set** button.

Select the **Done** key when finished, close the wizard, and reboot the thin client.

The thin client will toggle between the instant failover sessions when the configured hot key combination is selected.

13.4.6 Instant Failover Tree Icons

Under each Terminal are icons representing the Terminal Servers that they connect to. The lightning bolt color indicated the connection status.

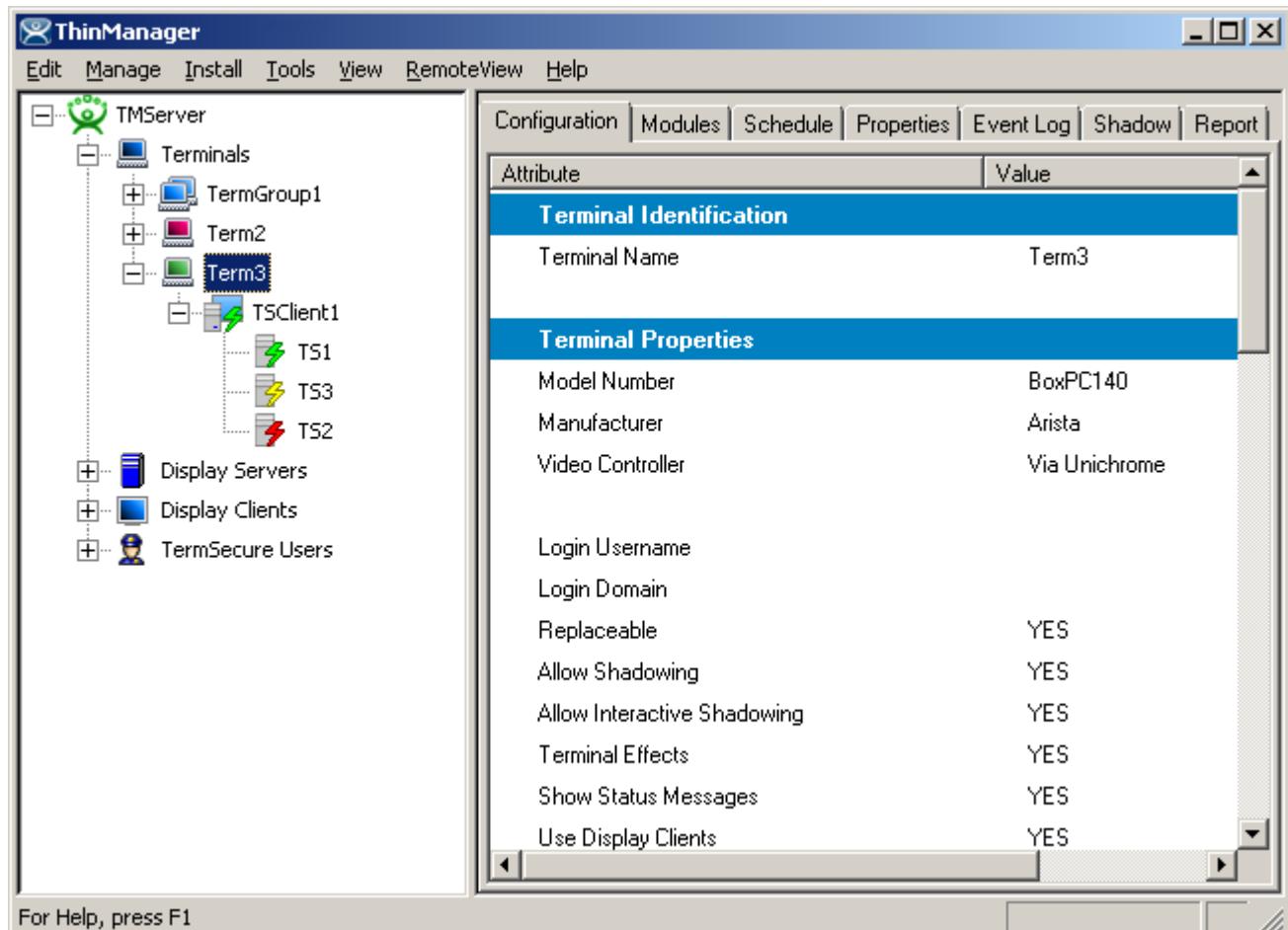


Terminal Server Connection Icons

A **Red lightning bolt** represents a lack of connection to the terminal server.

A **Green lightning bolt** represents a connection to the terminal server with an active session.

A **Yellow lightning bolt** represents a connection to the terminal server with an active session that is the backup in Instant Failover mode.



Instant Failover

If a terminal that is configured for Instant Failover is expanded in the ThinManager tree, the Primary Terminal Server should have a green lightning bolt, while the Secondary Terminal Server should have a yellow lightning bolt, as shown in the example.