

14 Failover and Instant Failover

14.1 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 thin client. This is covered in Failover.

Instant Failover: Instant Failover is the ability of 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.

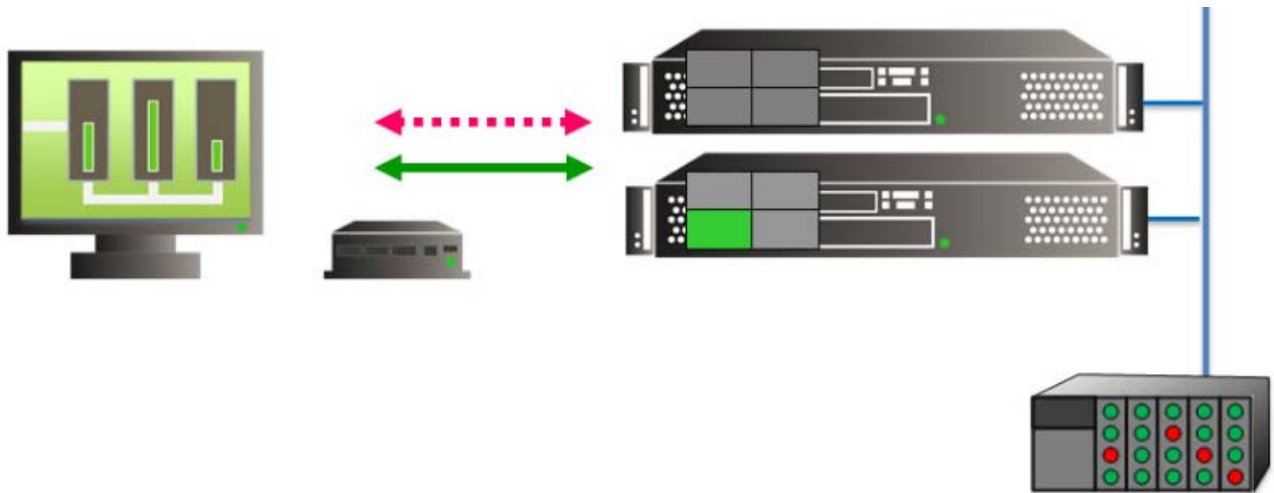
Redundancy: Redundancy refers to multiple ThinManager Servers. Thin clients are not dependent on ThinManager after booting and will continue to run if the ThinManager Server fails. However, rebooted terminal will wait until the ThinManager Server is restored until it boots and receives its configuration.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

14.2 Failover

ThinManager gives every thin client has the ability to switch between multiple terminal servers if a terminal server fails. Each thin client has a socket connection to its terminal servers. If the socket breaks the thin client will try to reconnect to the primary 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.

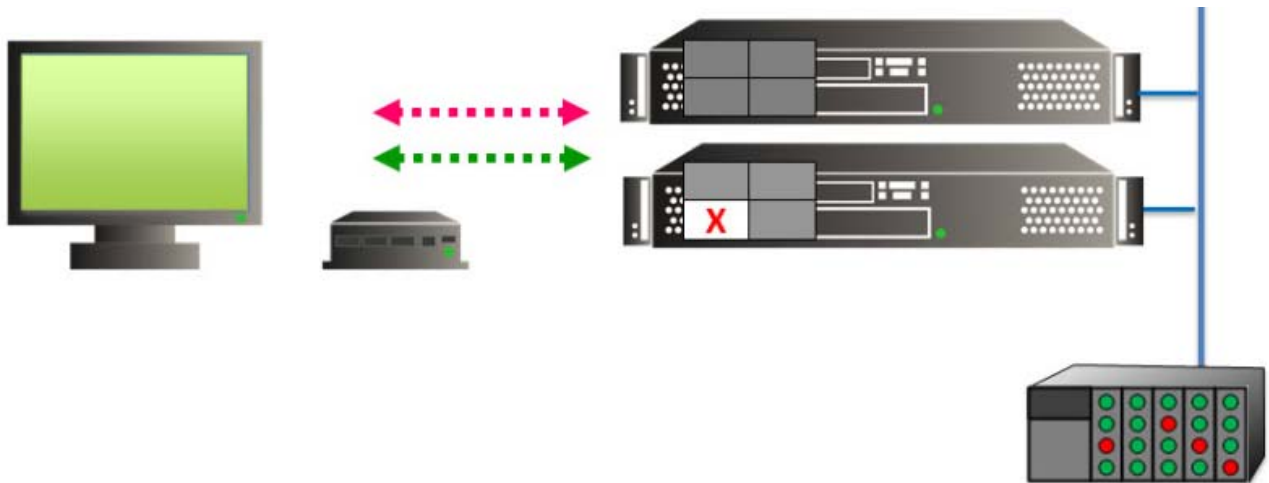
Failover requires:

- 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



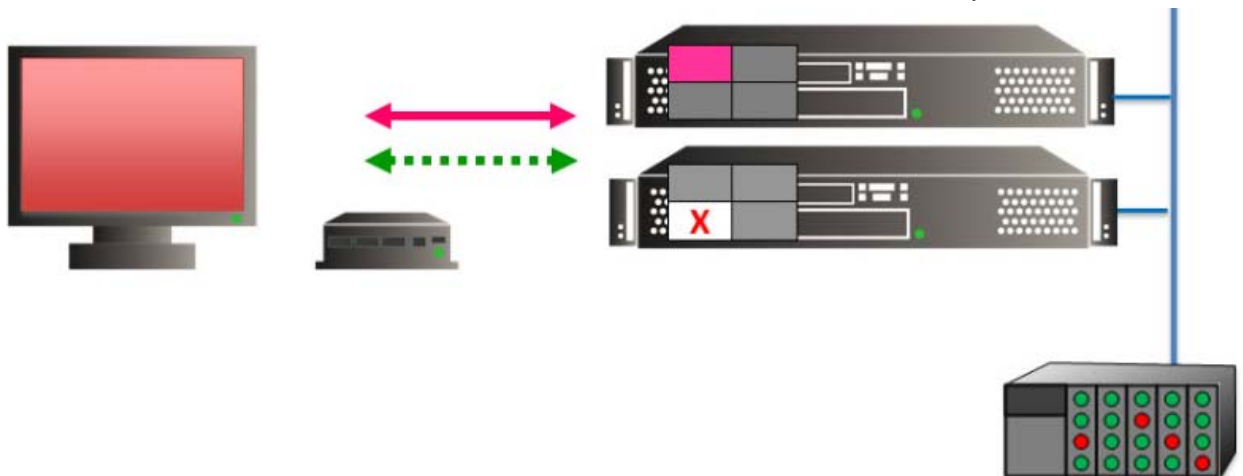
Failover Step 1 – Session on Primary Terminal Server

The thin client is configured to use two or more terminal servers.



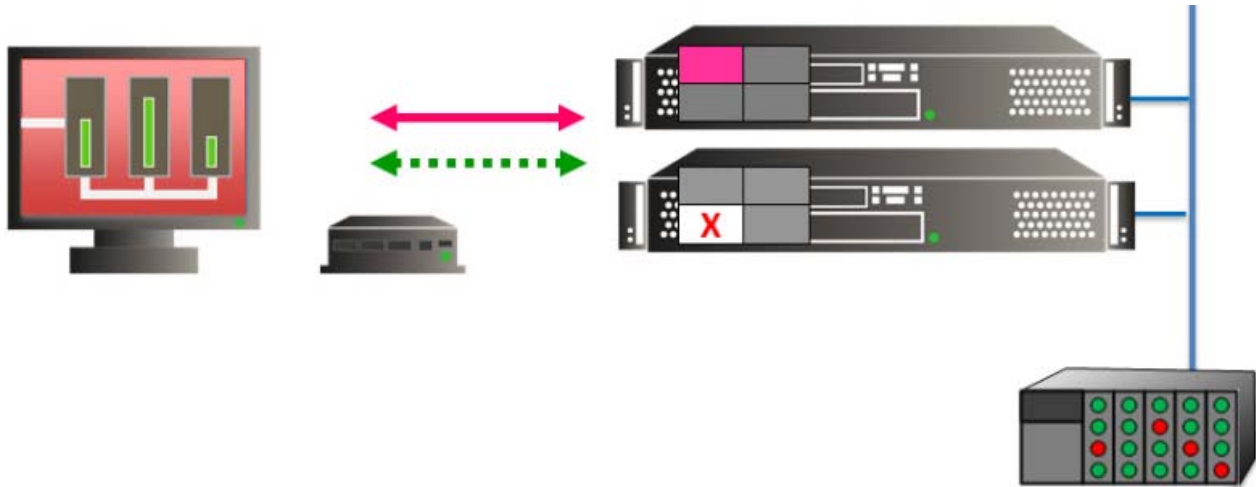
Failover Step 2 – Primary Terminal Server Failure

If the connection between the thin client and terminal server fails the thin client will retry the connection.



Failover Step 3 – Thin Client Automatically Switches to Secondary Terminal Server

If the thin client cannot connect to the primary terminal server it will automatically switch to the next terminal server in the list, and start a new session.



Failover Step 4 – Thin client has Session Running on Secondary Terminal Server

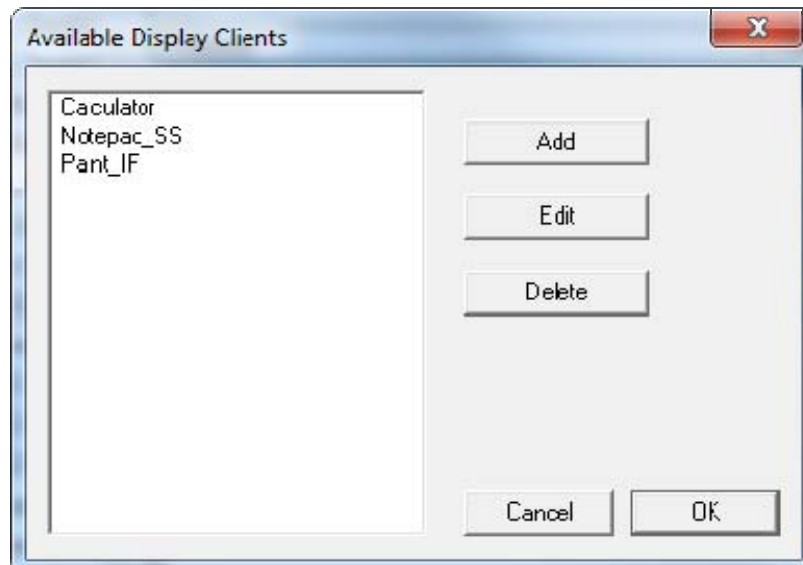
Once connected it will login and launch the AppLink application. Any runtime data will remain constant since both servers are drawing the same runtime data from the production floor.

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.

14.2.1 Failover Setup in Terminal Services Display Clients

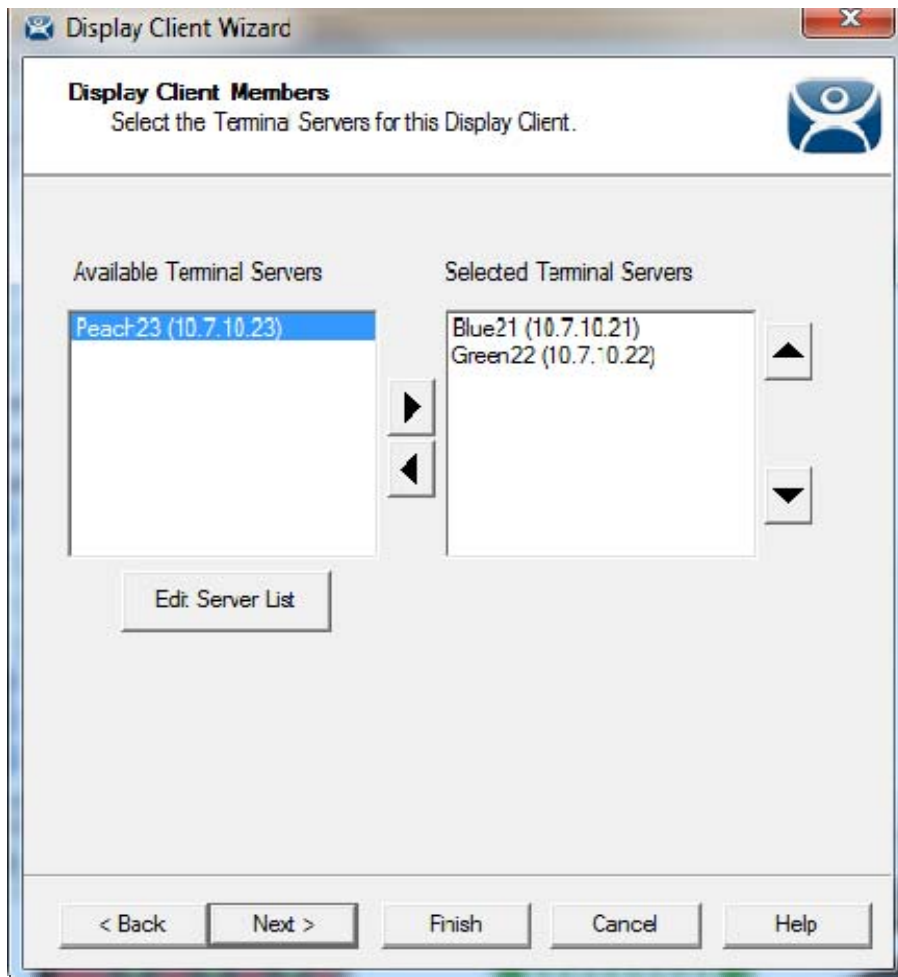
Failover is configured in the Display Client Configuration Wizard. Terminal Services Display Clients allow a terminal to run a session from a list of terminal servers. The Display Client will have Failover capability if two or more terminal servers are added to it.

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**.



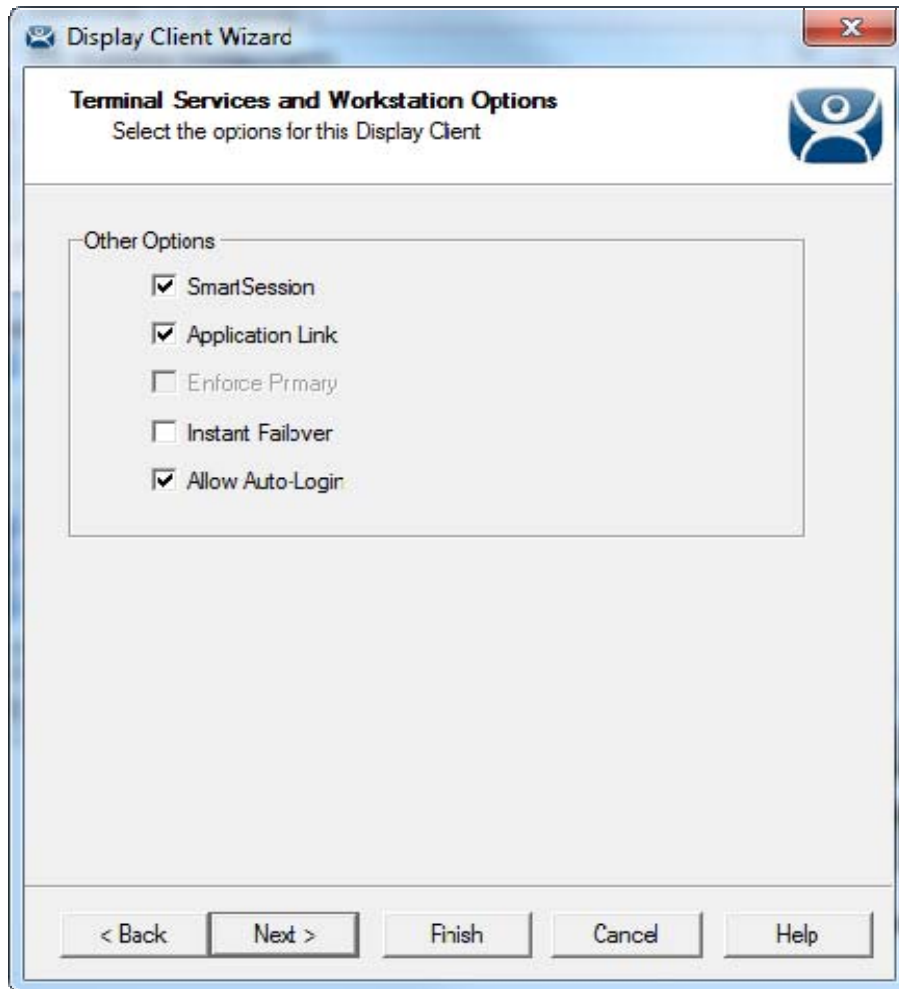
Display Client List

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 – Display Client 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.

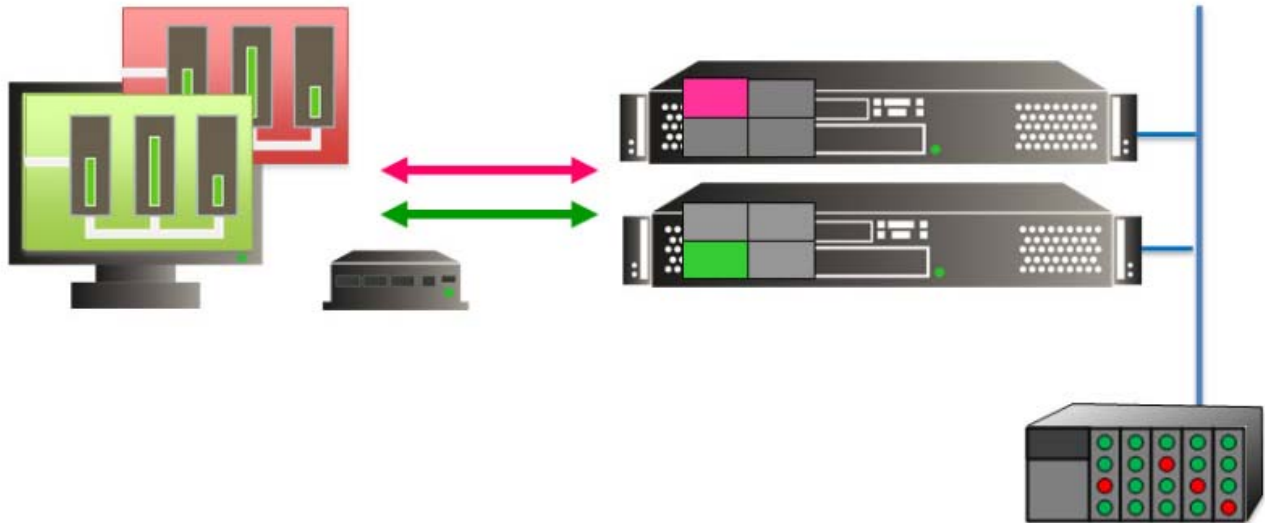
Selecting the **SmartSession** checkbox on the **Display Client Options** page of the **Display Client Wizard** configures SmartSession. When SmartSession is used the **Enforce Primary** checkbox is no longer relevant.

14.3 Instant Failover

Every ThinManager thin client can be configured to use basic failover. 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 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.

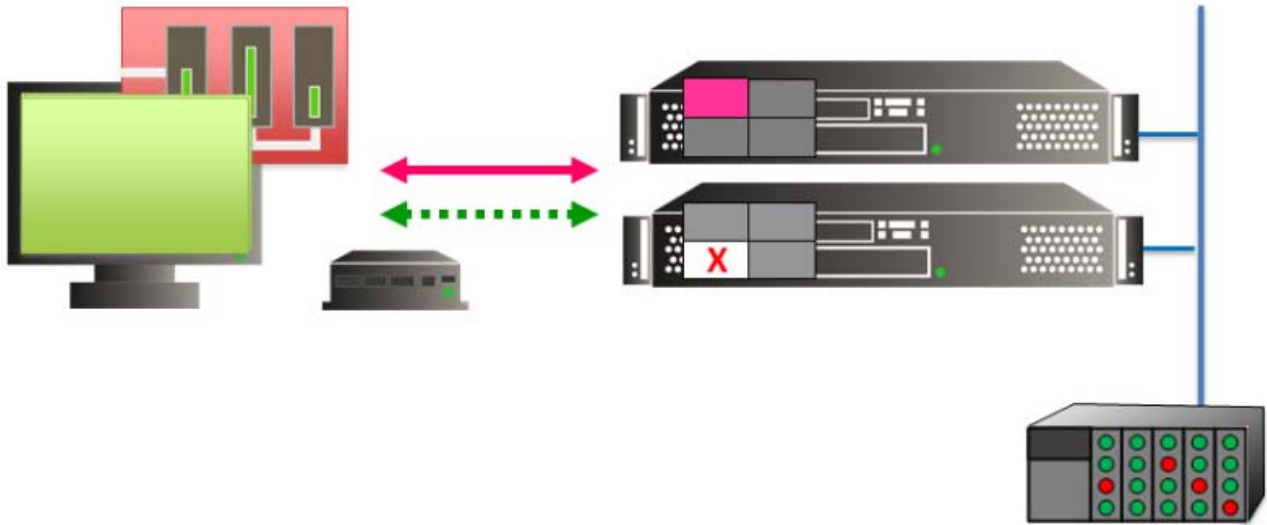
Note: Use a *Username*, *Password*, and *Initial Program* to allow the thin client to login automatically and start a program so that the background session is immediately ready and not needing a login and program launch.



Instant Failover Step 1 – Session on Two Terminal Servers

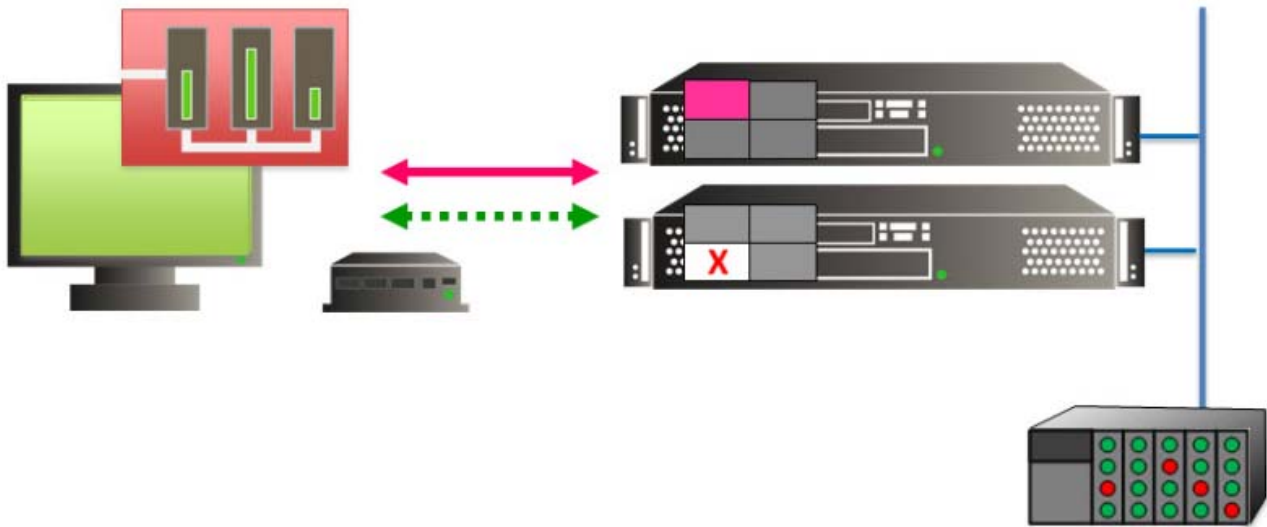
Instant Failover configures the thin client to make connections to two terminal servers for each AppLink Display Client. These will be cascaded so only the primary session is shown. There is an optional hot key toggle available to allow toggling between sessions. See Hotkey Configuration for details.

This allows the thin client to connect and initialize a session on a backup server so you don't have to wait for the session to load.



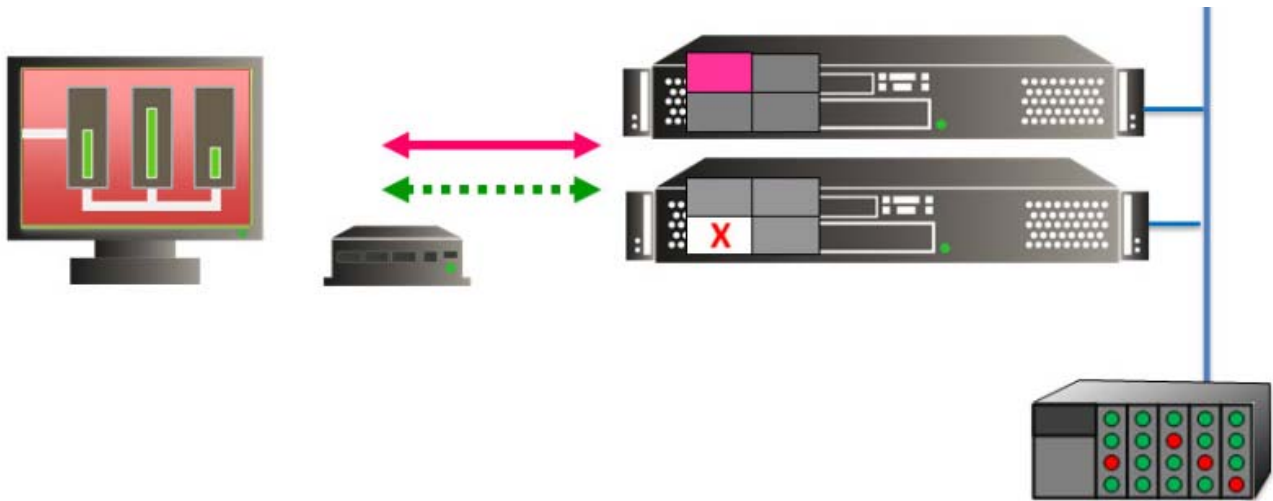
Instant Failover Step 2 – Primary Terminal Server Failure

The thin client has a socket connection to each terminal server so it will quickly detect a terminal server failure.



Instant Failover Step 3 – Switching to Backup Session on Secondary Terminal Server

As soon as the thin client detects the failure of the primary terminal server the thin client will switch to the backup session and pull it to the foreground. Since the session is already initialized you don't have to wait for your control system to load.



Instant Failover Step 4 – Session on Secondary Terminal Server

Instant Failover allows the thin client to use two active sessions to prevent downtime.

Note: Instant Failover is free from ThinManager but usually requires two application licenses since you have two active sessions. Please see your application vendors for details on their licensing policies.

If three or more terminal servers are in the Selected Terminal Server list, the thin client will connect to a new backup to ensure that it has an active backup.

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

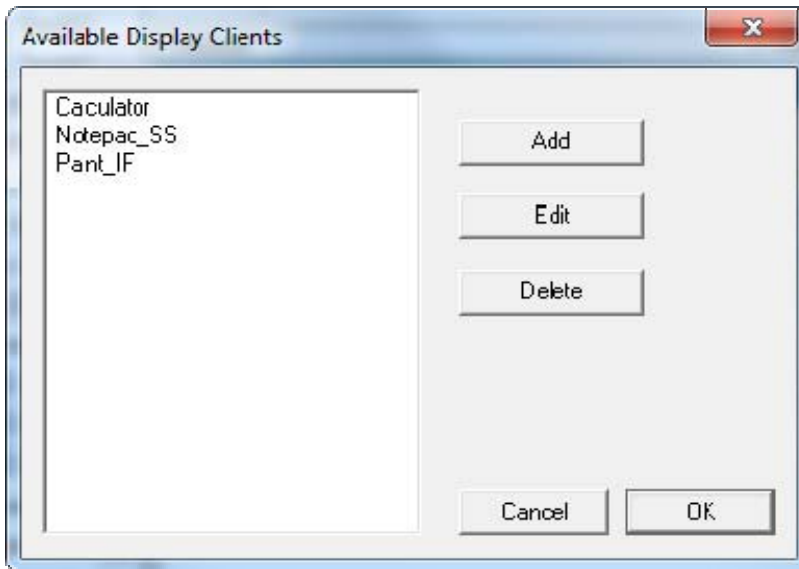
14.4 Instant Failover Configuration

Instant Failover is configured as part of Terminal Services Display Clients Wizard.

14.4.1 Instant Failover Setup in Terminal Services Display Clients

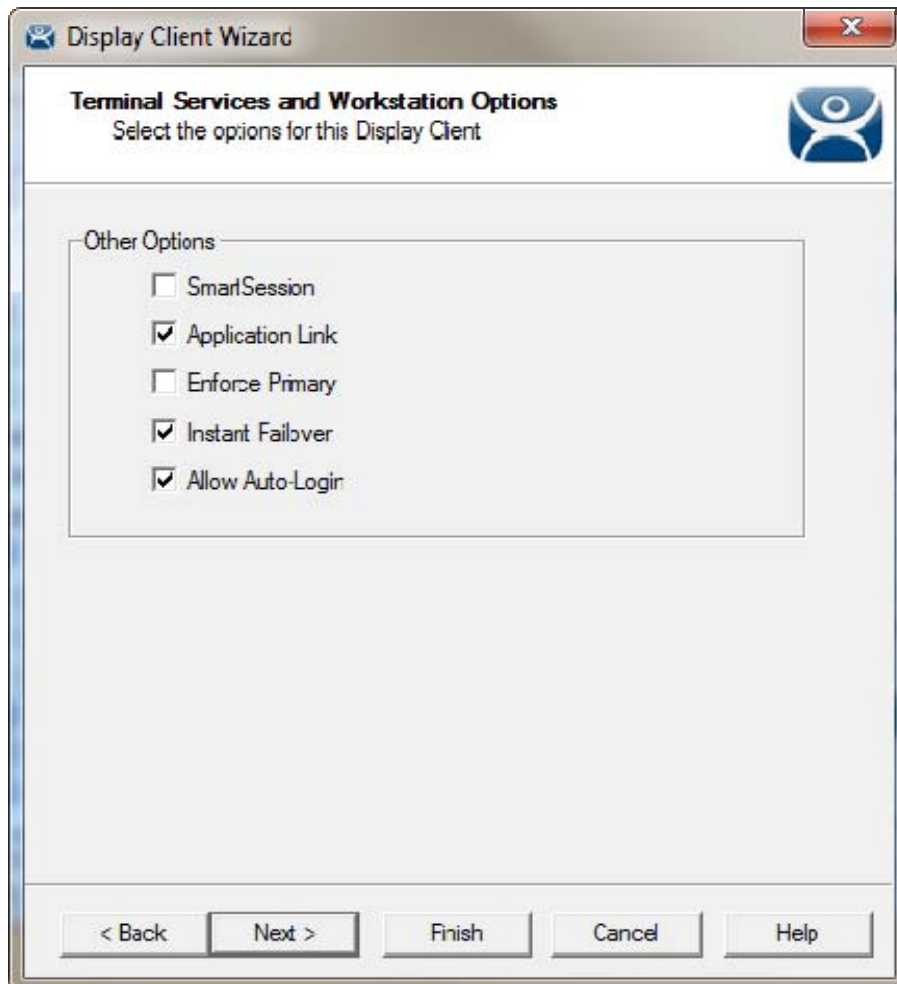
Terminal Services Display Clients allow a terminal to run a session from a list of terminal servers. The Display Client will have Instant Failover capability if two or more terminal servers added to it and the Instant Failover option is selected. This is configured in the Terminal Services Display Client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

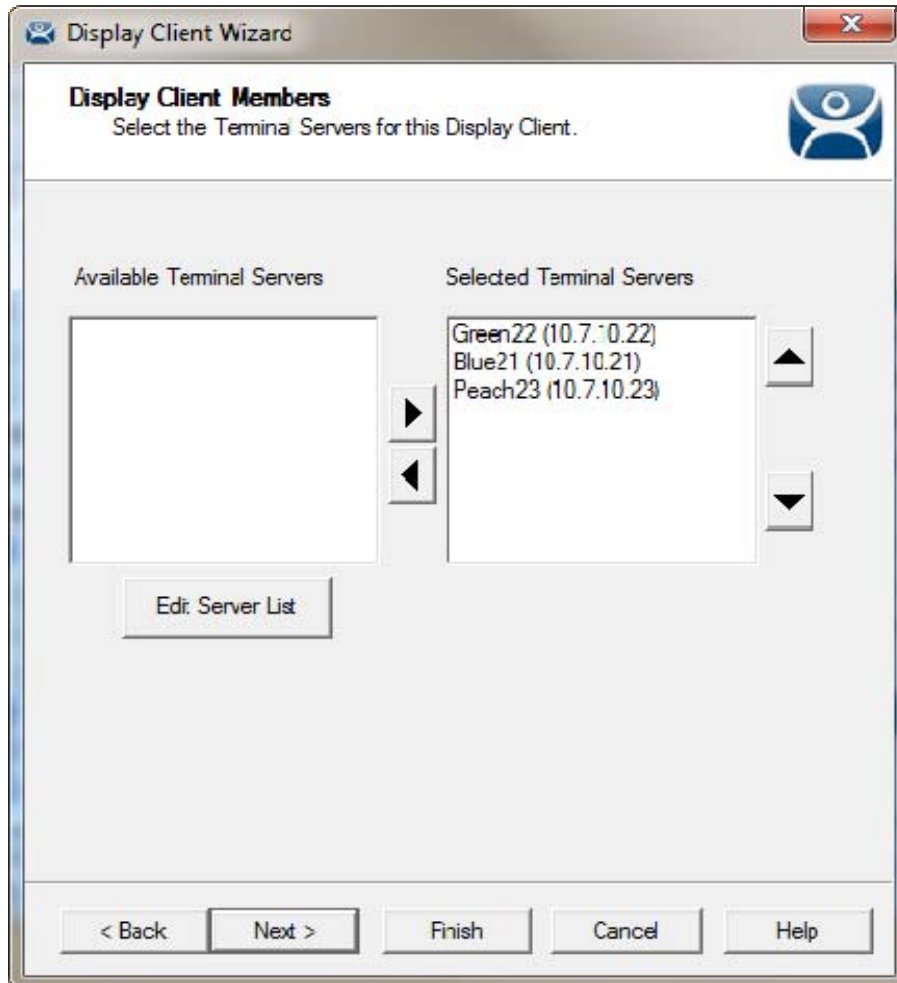


Select the **Instant Failover** check box on the **Display Client Options** page to enable instant failover for the Display Client.

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 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.

14.4.2 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.

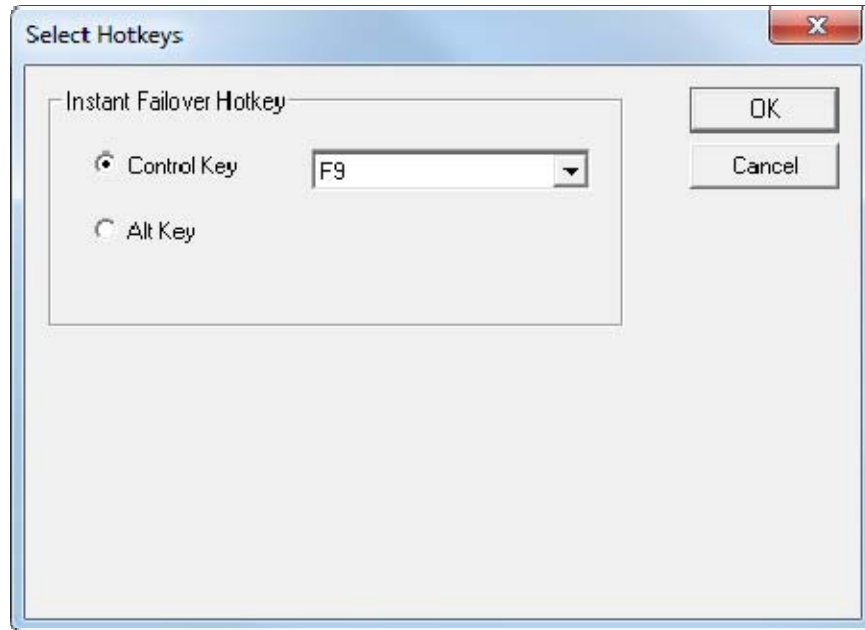


Terminal Configuration Wizard – Hotkey Configuration Page

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.

Note: The hotkey will not work properly if **Enforce Primary** is selected as a Display Client option on the Terminal Services Options page. As soon as you try to switch to the backup the thin client will switch you back to the Primary Terminal Server. It is recommended that you uncheck the **Enforce Primary** option if you plan on using the Instant Failover hotkey.

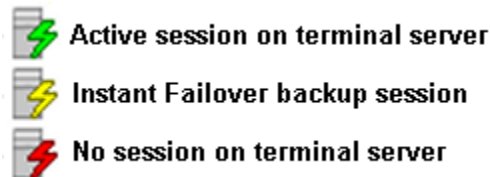


Select Hotkeys Windows

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.

14.4.3 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.

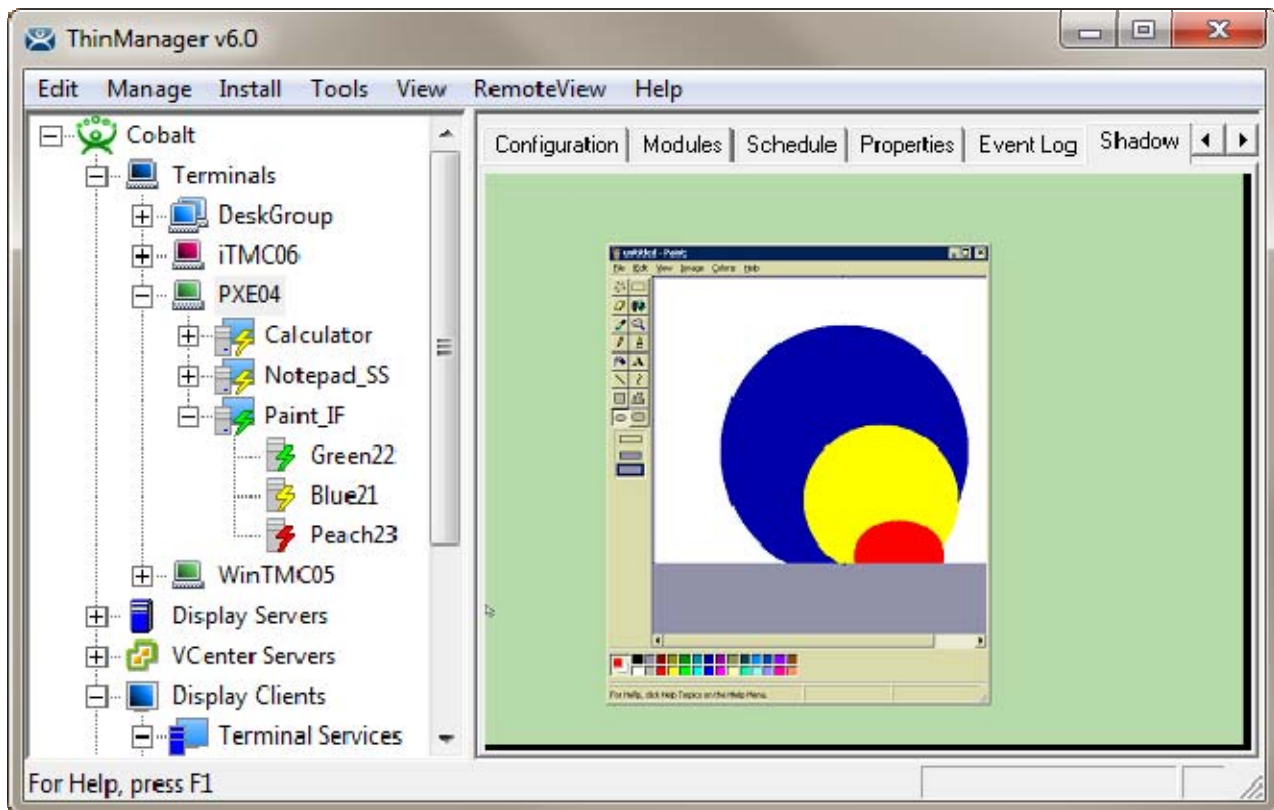


Terminal Server Connection Icons

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.

In this example the primary session is on Green22 and it shows a green lightning bolt icon. Blue21 is the secondary session and has a yellow lightning bolt icon. Peach23 is the third server in the list and has a red lightning bolt icon. This means that it doesn't have an active session but is available if server 1 or server 2 go offline.