



Connection Broker

Where Virtual Desktops Meet Real Business

Multiple Display Support

Versions 6.0
April 27, 2009

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Patents

Leostream products are patent pending.

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Multiple Display Support

Overview

Leostream's support for multiple displays provides your end users with true multi-monitor behavior when they log into their remote sessions, including:

- Splitting or spanning remote desktop connections over multiple monitors.
- Restricting the taskbar to the primary monitor.
- Centering the Microsoft® Windows® login and logout dialogs, along with most message boxes, in the middle of the primary monitor.
- Maximizing application windows intuitively. For example, if the user places the majority of an application window within one monitor, maximizing the windows fills that monitor. If, on the other hand, the window is resized to cover a large percentage of two monitors, maximizing the windows fills both monitors.
- Positioning and resizing application windows dragged between monitors, based on the size of the new monitor.
- Returning to single monitor mode if the extra monitors are disconnected from the client.

Multiple display support is available for clients that are attached to multiple monitors with the following characteristics.

- All monitors are arranged horizontally.
- The primary monitor is the left-most monitor.
- All monitors in the layout have the same resolution.
- There are between 2 and 16 monitors.

The remote session can be invoked with any remote viewer protocol, including Microsoft RDP, Citrix® ICA, HP® RGS, etc.

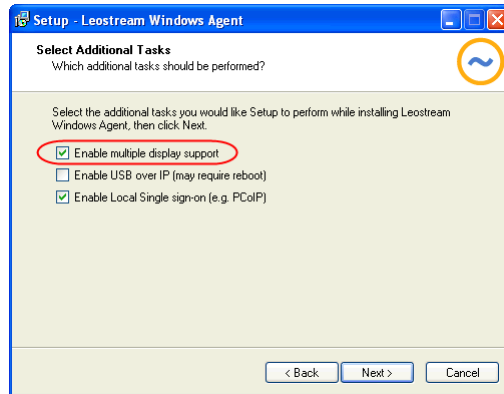
System Requirements

In order to use the Leostream multiple display feature, you must be using Connection Broker 6.0. In addition, you must install Leostream Agent 4.2 on every remote machine connected to by clients with multiple monitors



Leostream does not currently support multiple displays when connecting to Linux® desktops.

To enable the multiple display support, install the Leostream Agent with the **Enable multiple display support** component selected, as shown in the following figure.



Configuring Your Connection Broker

To roll-out multiple display support to your end users, you must do the following:

1. Install the Leostream Agent on each remote desktop.
2. Ensure that any Connection Broker policies that specify the Microsoft RDP remote viewer protocol in the **Leostream Connect Configuration** section contain the following line:

```
span monitors:i:{LEO_SPAN}
```

The Leostream multiple display feature requires a spanned RDP session. The Connection Broker replaces the dynamic tag `LEO_SPAN` with 1 or 0, depending on if the client is assigned a monitor layout.

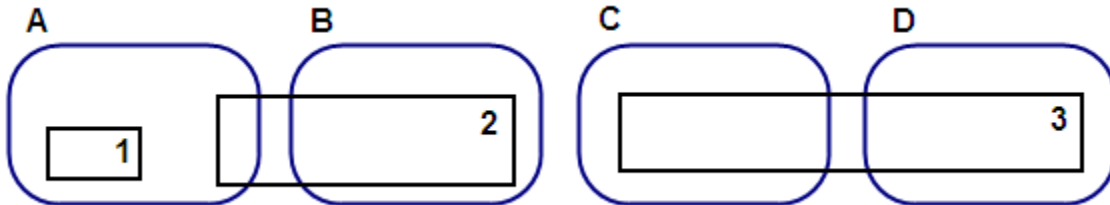
3. In the Connection Broker, define common monitor layouts and assign them to clients.

A *monitor layout* describes a common monitor configuration; for example, two monitors that sit side-by-side. When you create the monitor layout, you assign it to clients based on the client's attributes, similar to creating Connection Broker Locations.

When a user logs in through a client with attributes that match a particular monitor layout, the Connection Broker assigns that monitor layer to the client, and communicates that monitor layout to the Leostream Agent. The Leostream Agent on the remote desktop then handles positioning and resizing of application windows, including the Windows Taskbar, within the monitors in the layout.

Maximizing Windows over Multiple Displays

The Leostream Agent intelligently maximizes application windows based on their location across all monitors. For example, consider the four monitors arranged side by side, depicted in the following figure.



The monitors are lettered A, B, C, and D. The numbered rectangles inside the monitors represent application windows. When an end user maximizes each of the application windows, the Leostream Agent sizes the windows to fill the monitors, as follows.

- Application 1:** Fills monitor A
- Application 2:** Fills monitor B
- Application 3:** Fills monitors C and D

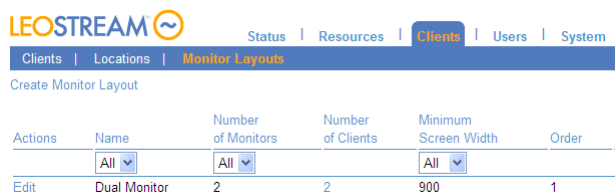
When the Leostream Agent detects that an application covers the majority of multiple monitors, it will maximize the application to fill all of those monitors.

Creating Monitor Layouts

To begin using multi-monitor support, define the typical monitor layouts used by your end users. You then use these monitor layouts to define groups of clients with a similar monitor configuration. If these clients connect to desktops with an installed Leostream Agent, the end user experiences the Leostream multiple display behavior.

Defining Monitor Layouts

To define a monitor layout, go to the > **Clients > Monitor Layouts** page, shown in the following figure.



This page lists all monitor layouts you previously define. By default, the Connection Broker does not contain any monitor layouts, and all clients adhere to the display settings specified in the user's policy for the remote viewer protocol. For example, if the user's policy selects RDP, and the configuration file sets the `span monitors` option, the Connection Broker spans the remote session across the user's monitors.

To create a monitor layout:

1. Click the **Create Monitor Layout** link. The **Create Monitor Layout** form, shown below, opens.

2. Enter a name for the layout in the **Name** edit field.
3. From the **Number of monitors** drop-down menu, select the number of monitors attached to clients in this layout.
4. In the **Assume single monitor if screen width is less than** edit field, enter the width (in pixels) of the smallest resolution monitor in this layout. For example, if clients in this group are attached to monitors with a resolution of 1200x800, enter 1210. If the client is attached to two monitors, the total width is 2400 and the Connection Broker applies the monitor layout. If, however, one of the monitors is disconnected, the client has a total display width of 1200. The Connection Broker sees that this value is less than the threshold of 1210 and switches to a single monitor layout.
5. Select the **Lock taskbar to a primary monitor** option to restrict the Windows task bar to span across only the primary (or left-most) monitor. If this option is not selected, the task bar spans across all monitors.
6. By default, Leostream controls the positioning of all application windows. If you do not want Leostream to control the windows for particular applications, enter the process name for these applications, separated by commas, into the **Applications to exclude** edit field. All windows associated with these processes will position, maximize, and resize as usual in a spanned remote session.
7. If you have multiple monitor layouts, use the **Monitor Layout Order** drop-down menu to reorder the layouts. If this is your first monitor layout, the form does not include the **Monitor Layout Order** drop-down menu.

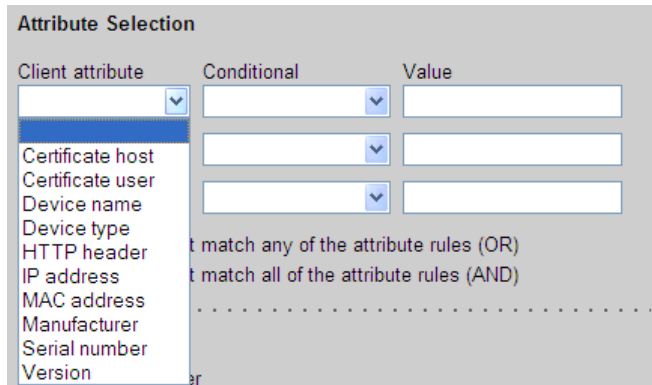
The Connection Broker applies monitor layouts in the order they are listed in the **> Clients > Monitor Layouts** page. When an end user logs in, the Connection Broker assigns the client to the first monitor layout that matches the client's attributes.

8. Uncheck the **Active monitor layout** option if you want to disable this monitor layout, so the Connection Broker will not apply it to any clients, but do not want to delete the monitor layout.
9. Click **Save**.

Assigning Monitor Layouts to Clients

Use the **Attribute Selection** section of the **Create Monitor Layout** form to assign monitor layouts to clients. Each row in the **Attribute Selection** section reads as a rule that defines clients assigned to this monitor layout.

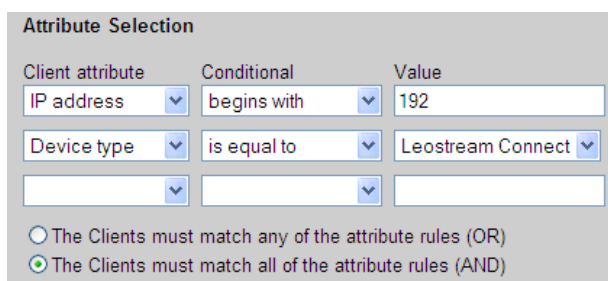
1. Select an attribute from the **Client attribute** drop-down menu, shown in the following figure.



The screenshot shows the 'Attribute Selection' form with three columns: 'Client attribute', 'Conditional', and 'Value'. The 'Client attribute' dropdown menu is open, displaying a list of attributes: Certificate host, Certificate user, Device name, Device type, HTTP header, IP address, MAC address, Manufacturer, Serial number, and Version. The 'Conditional' column has three dropdown menus, and the 'Value' column has three text input fields. Below the dropdowns, there are two radio button options: 'The Clients must match any of the attribute rules (OR)' and 'The Clients must match all of the attribute rules (AND)'. The 'OR' option is currently selected.

2. Select a logic condition from the **Conditional** drop-down menu.
3. Enter or select the appropriate **Value** for this rule.
4. Create up to two additional rules in the remaining rows.
5. Indicate if the client can match any rule (OR) or must match all rules (AND), in order to be assigned to this monitor layout.
6. Click **Save**.

For example, the following figure shows how to apply a monitor layout to all Leostream Connect clients with an IP address that begins with 192.



The screenshot shows the 'Attribute Selection' form with the following configuration: The first row has 'IP address' in the 'Client attribute' dropdown, 'begins with' in the 'Conditional' dropdown, and '192' in the 'Value' text field. The second row has 'Device type' in the 'Client attribute' dropdown, 'is equal to' in the 'Conditional' dropdown, and 'Leostream Connect' in the 'Value' dropdown. The third row has empty dropdowns and text fields. Below the rows, the 'The Clients must match all of the attribute rules (AND)' radio button is selected.

After all of your monitor layouts are defined and assigned to clients, and the Leostream Agents are installed, you are finished configuring your Connection Broker to provide multiple monitor support.

Hard-Assigning a Monitor Layout to a Client

In some cases, you may need to hard-assign a particular monitor layout to a client, or specify that a client does not support multiple monitors. To hard assign a monitor layout to a client:

1. On the **> Clients > Clients** page, select the **Edit** action for appropriate client. The **Edit Client** form opens.
2. In the **Assignment** section, select **Hard-assigned to a specific monitor layout** from the **Monitor Layout Assignment Mode** drop-down menu.

3. Select the appropriate monitor layout from the **Assigned Monitor Layout** drop-down menu, as shown in the following figure.

The screenshot shows the 'Edit Client "KAREN"' form. Under the 'Assignment' section, the 'Desktop Assignment Mode' is 'Policy-driven'. The 'Monitor Layout Assignment Mode' is 'Hard-assigned to specific monitor layout'. The 'Assigned Monitor Layout' is 'Select...'. Red arrows labeled 2 and 3 point to these two dropdown menus respectively. At the bottom are 'Save' and 'Delete' buttons.

4. Click **Save** on the **Edit Client** page.



You must install the Leostream Agent on desktops that connect to a client with a hard-assigned monitor layout.

Opting Out of Multi-Monitor Support

If you want to ensure that a particular client is never assigned a monitor layout, you can opt out as follows:

1. On the **> Clients > Clients** page, select the **Edit** action for appropriate client. The **Edit Client** form opens.
2. In the **Assignment** section, select Opt out from multi-monitor support from the **Monitor Layout Assignment Mode** drop-down menu, as shown in the following figure.

The screenshot shows the 'Edit Client "KAREN"' form. Under the 'Assignment' section, the 'Desktop Assignment Mode' is 'Policy-driven'. The 'Monitor Layout Assignment Mode' is 'Opt out from multi-monitor support'. A red arrow points to this dropdown menu.

3. Click **Save** on the **Edit Client** page.

When a client with no multi-monitor support connects to a remote desktop, the remote viewer configuration file determines the resolution and number of monitors supported in the remote viewing session. For example, you can manually include the following line in your RDP Configuration file to span multiple monitors.

```
span monitors:i:1
```

However, in this case, the Leostream Agent will not handle positioning and resizing of application windows.