Quick Start with Leostream and PCoIP

Advanced Connection Management For Hybrid and Multi-Cloud Environments

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Patents

Leostream software is protected by U.S. Patent 8,417,796.
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Chapter 1: Overview

The Leostream Connection Broker makes it possible to manage connections to pools of workstations that have installed PCoIP Remote Workstation card. The PCoIP Remote Workstation Cards provide the full frame-rate rendering capabilities necessary to create complex designs and images, without ever having to be in the same office; with their sensitive corporate IP protected. For an introduction to the Leostream Connection Broker, see our guide Getting Started with Connection Broker Concepts.

⚠️ The Remote Workstation Card must use Teradici firmware version 4.9 to use all the broker functionality provided by the Leostream Connection Broker.

Teradici® PCoIP® technology provides an optimal end-user experience when connecting users to hosted desktops by delivering a true PC experience over standard IP networks. For more information on the PCoIP protocol, please visit http://www.teradici.com/pcoip-technology.

If you want to use Leostream and Teradici to build a virtual workspaces solution using the Teradici Cloud Access Software or Cloud Access Platform, see the Leostream Quick Start Guide for Using Leostream with the Teradici Cloud Access Platform.

Teradici PCoIP Components

The Leostream Connection Broker manages three distinct components in environments that include workstations with PCoIP Remote Workstation cards.

- **Desktop operating systems**: Leostream manages connections to remote workstations running Microsoft® Windows®, Linux, and macOS operating systems. Desktops that support the PCoIP protocol appear in the > Resources > Desktops page of the Connection Broker.

- **PCoIP Remote Workstation Cards**: Leostream automatically pairs the PCoIP Remote Workstation card, the PCoIP hardware technology used to transfer information from the desktop to the client, to the desktop operating system running in the workstation. PCoIP Remote Workstation cards appear in the > Resources > PCoIP Host Devices page of the Connection Broker.

- **PCoIP Zero Clients**: A number of client vendors, such as Amulet Hotkey and Dell Wyse®, have embedded PCoIP processors into their end-point, zero client hardware. With the single purpose of image decompression and decoding, the PCoIP processor eliminates endpoint hard drives, graphic processors, operating systems, applications and security software. PCoIP client devices appear in the > Resources > Clients page of the Connection Broker.
Using PCoIP Clients with Leostream

You can use any supported PCoIP software, mobile, or zero client to log into Leostream. The type of client you use and whether the client communicates with the Leostream Connection Broker or the PCoIP Connection Manager, determines what types of resources the client can connect to. The following table describes the types of resources users can connect to using different types of PCoIP clients.

<table>
<thead>
<tr>
<th>If the user logs into</th>
<th>And the client communicates with</th>
<th>The client can connect to Virtual Machines</th>
<th>The client can connect to Physical Machines</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCoIP Software (Mac, Windows, ChromeOS), PCoIP Mobile, PCoIP Zero</td>
<td>PCoIP Connection Manager</td>
<td>Running the PCoIP Standard or Graphics Cloud Access Software</td>
<td>N/A</td>
</tr>
<tr>
<td>PCoIP zero client</td>
<td>Leostream Connection Broker</td>
<td>Running the VMware Horizon View Direct Connection Plug-In</td>
<td>With an installed Remote Workstation Cards</td>
</tr>
</tbody>
</table>
| Leostream Connect | Leostream Connection Broker | • Running the VMware Horizon View Direct Connection Plug-In – Leostream Connect launches the VMware Horizon View Client to establish the connection  
• Running the Teradici Cloud Access Software – Leostream Connect launches the PCoIP software client to establish the connection | With an installed Remote Workstation Cards – Leostream Connect launches the PCoIP Software client to establish the connection |
Chapter 2: Configuring the Connection Broker

Step 1: Preparing the Connection Broker to Integrate with PCoIP Remote Workstation Cards

The Connection Broker is configured using the Administrator Web interface, where you define the Leostream concepts that control your environment. For more information on Leostream concepts, see the Introduction to the Leostream Platform guide.

The following procedure steps you through a general Connection Broker configuration. It assumes you already installed and licensed your Leostream Connection Broker. For information on installing and licensing the Leostream components, see the Leostream Installation Guide.

⚠️ Teradici firmware version 4.9 requires TLSv1.0, while Teradici firmware version 5.x requires TLSv1.1. To use these firmware versions with Leostream, ensure that you enable TLSv1.0 and/or TLSv1.1 on your Connection Broker > System > Settings page, as follows.

1. In the Connection Broker Security Options section, check Accept connections using TLS version 1.0 and Accept connections using TLS version 1.1, for example:

2. Click Save.

After licensing your Connection Broker and, if necessary, changing the TLS settings, ensure that you reboot your Connection Broker to enable PCoIP Remote Workstation Card discover. To reboot your Connection Broker:

1. Go to the > System > Maintenance page.
2. Select Reboot the Connection Broker.
3. Click Next.
Step 2: Registering PCoIP Devices with the Connection Broker

After you apply your Leostream license and reboot your Connection Broker, the > Setup > Centers page includes a PCoIP Devices center. The Connection Broker uses this center as a repository for the PCoIP Remote Workstation Cards in your environment. In addition, you can use this center to setup any client binding or firmware updating information, as described in Appendix B.

You can register your PCoIP Remote Workstation Cards with your Connection Broker using one of the techniques described in the following sections.

In production environments, you should configure the pcoip-broker DNS SRV records as described in Discovering PCoIP Remote Workstation Cards Using a DNS SRV Record. This technique automates the discovery of PCoIP devices by your Connection Broker. In addition, you can manually register PCoIP Remote Workstation cards and PCoIP zero clients with your Connection Broker.

Discovering PCoIP Remote Workstation Cards Using a DNS SRV Record

When the PCoIP Remote Workstation Card is running firmware version 4.9, it can automatically discover the location of the Connection Broker through your network’s DNS server. When a PCoIP Remote Workstation Card starts, it queries your DNS server for an SRV record that points to the Connection Broker.

The Leosteam Agent running in the desktop operating system queries a different SRV record to find the location of the nearest Connection Broker. The two relevant DNS records are:

- Leostream Agent: _connection_broker
- PCoIP devices: _pcoip-broker

When setting up the _pcoip-broker record, ensure that you point to an A record for your Connection Broker, not to the Connection Broker IP address, and that the record uses port 50000.

When you add a new PCoIP Remote Workstation Card to your network, the card contacts the Connection Broker specified in the DNS SRV record. The Connection Broker then adds the card to the > Resources > PCoIP Host Devices page.

If new Remote Workstation Cards are not appearing in your Connection Broker, ensure that your Connection Broker accepts communications using TLS version 1.0 and reboot your Connection Broker to ensure that port 50,000 is open.

You can check for the DNS SRV records using nslookup. After you start nslookup, enter the following commands at the nslookup prompt:

```bash
set querytype=SRV _pcoip-broker._tcp.domain.name
```

Where domain.name is your domain name. If the record exists, nslookup returns the priority, weight, port, and SRV hostname. Otherwise, it returns a message indicating the record is not found.
Adding PCoIP Remote Workstation Cards to the Connection Broker

If you are not using a DNS SRV record to inventory your cards, or your DNS SRV record is pointing to a different Connection Broker, you can manually add PCoIP Remote Workstation cards to the Connection Broker, in one of two ways.

1. Manually add individual cards, as described in this section.
2. Upload a CSV-file describing multiple cards, as described in the following section.

To create individual PCoIP Remote Workstation cards in your Connection Broker.

1. Go to the > Resources > PCoIP Host Devices page.
2. Click the Add PCoIP Host Device link.
3. In the Add PCoIP Host Device form that opens:
    a. Enter a name for the PCoIP host device in the Name edit field.
    b. If available, enter the device’s DNS name in the Hostname edit field.
    c. Enter the device’s IP address in the IP Address edit field.
    d. Click Save.

Uploading Multiple PCoIP Remote Workstation Cards

You can use the Upload PCoIP host devices option on the > System > Maintenance page to upload a group of PCoIP host devices into the Connection Broker. In order for the Connection Broker to associate PCoIP host cards with the desktops they are installed in, the host cards must be present in the Connection Broker before the Leostream Agent on the desktop registers with the broker.

By default, the uploaded CSV-file modifies existing PCoIP host cards, but does not create new host cards. To create new host cards select the Allow creation of new PCoIP host devices option, shown in the following figure.

If you do not select the Allow creation of new PCoIP host devices option, the Connection Broker indicates if it cannot find an existing host device and skips that row in the CSV-file.

When uploading PCoIP host devices data, the CSV-file must have the following format.
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- The CSV-file must be comma delimited
- Quotes must be double quotes
- The first row must contain the field names, separated by commas with no additional blank spaces, and the data must be in the remaining rows
- The field names must match the field names in the terahost table in the data dictionary
- The only modifiable fields are:
  - name
  - serial_number
  - mac
  - ip
  - hostname
  - notes
- One of the following fields is required and must uniquely identify the host card
  - id (for updating existing PCoIP host devices, only)
  - ip
  - hostname (either ip or hostname must be specified, but do not enter both)

Specify new PCoIP host devices using either the ip or hostname field, but not using both fields. New host cards cannot be created using an id field.

After uploading a CSV-file of PCoIP host devices, the Connection Broker performs a scan of the PCoIP Devices center and updates the PCoIP records with any additional information provided by the host card.

⚠️ If you are uploading information for Remote Workstation Cards running firmware version 5.0, specify as much information as possible. You must specify the devices MAC addresses. The Connection Broker cannot communicate with Remote Workstation Cards running firmware version 5.0 to retrieve additional information.

For a list of field names and values in the PCoIP host card table, go to:

https://cb-address/download/account_db.html#terahost

Where cb-address is your Connection Broker address.

Removing PCoIP Remote Workstation Cards from your Connection Broker

You can remove PCoIP Remote Workstation cards from the > Resources > PCoIP Host Devices page using any of the following methods.

1. Click the Delete action associated with a PCoIP Remote Workstation card
2. Select the Bulk action check box for multiple PCoIP Remote Workstation cards, as shown in the following figure, then select Delete from the bulk action drop-down menu at the top of the column of check boxes.
If bulk action check boxes are not included on your Resources > PCoIP Host Devices table, use the Customize columns link at the top-right of the page to add the Bulk action column.

Step 3: Adding Authentication Servers

The Connection Broker can inventory physical desktops and workstations using the Computer records found in your Active Directory tree. To import workstations from your Microsoft Active Directory tree, you must first add an Active Directory authentication server.

The Connection Broker also uses your Active Directory server to authenticate users and assign policies. Therefore, even if you don’t plan to inventory your workstations using an Active Directory center, ensure that you finish this step before continuing with your Connection Broker configuration.

Note: Any options not covered in the following procedure remain at their default values.

1. Navigate to the > Setup > Authentication Servers menu.

2. Click the Add Authentication Server link, shown in the following figure.

3. The Add Authentication Server form opens. In the Authentication Server name edit field, enter a name for this server in the Connection Broker.

4. In the Domain edit field, enter the domain name associated with this Active Directory server.
5. In the **Connection Settings** section, shown in the following figure, use the following procedure to integrate with your Active Directory authentication server.

   ![Connection Settings](image)

   a. Select **Active Directory** from the **Type** drop-down list.

   b. From the **Specify address using** drop-down menu, select **Hostname or IP address**.

   c. Enter the authentication server hostname or IP address in the **Hostname or IP address** edit field.

   d. Enter the port number in the **Port** edit field.

   e. Check on the **Encrypt connection to authentication server using SSL (LDAPS)** checkbox if you need a secure connection to the authentication server. The port number automatically changes to 636. Re-edit the **Port** edit field if you are not using port 636 for secure connections.

6. In the **Search Settings** section, shown in the following figure, enter the username and password for an account that has read access to the user records. Leostream does not need full administrator rights to your Active Directory authentication server.

   ![Search Settings](image)

7. In the **User Login Search** section, ensure that the **Match Login name against this field** edit field is set to **sAMAccountName**. This is the attribute that the Connection Broker uses to locate the user in the authentication server, based on the information the user enters when logging into Leostream.

8. Click **Save**.
Quick Start

For more detailed instructions, see the chapter “Authenticating Users” in the Connection Broker Administrator’s Guide.

Step 4: Adding Workstations to your Connection Broker

After you import your PCoIP Remote Workstation Cards and connect Leostream to your authentication servers, inventory your workstations using either an Uncategorized Desktops center or Active Directory center. If all your Workstations have Computer records in Active Directory, create an Active Directory center. Otherwise, use the Leostream Agent to register your workstations with the Uncategorized Desktops center.

⚠️ To simplify your Connection Broker configuration, use either an Active Directory center or an Uncategorized Desktops center. Simultaneously using both types of center can lead to duplicate desktop records in your Connection Broker.

Creating an Active Directory Center

To add an Active Directory center:

1. Go to the > Setup > Centers page.

2. Click Add Center.

3. Select Active Directory from the Type drop-down menu. The form updates, as shown in the following figure.
4. Enter a name for the center in the **Name** edit field.

5. Select the associated Active Directory authentication server from the **Authentication Server** drop-down menu. The list contains only the Active Directory server you entered into your Connection Broker in step 3.

6. In the **Sub-tree** edit field, specify the sub-tree within the Active Directory system that contains the machines. If you do not specify a sub-tree, the Connection Broker assumes the same start point as the Active Directory search start point.

7. Leave the remaining fields at their default values and click **Save**.

After you create your Active Directory center, go to the > **Resources > Desktops** page. This page lists the workstations the Connection Broker imported from the Active Directory tree.
Creating an Uncategorizd Desktops Center

If your desktops are not part of your Active Directory structure, you can inventory your desktops using an Uncategorizd Desktops center. To add the Uncategorizd Desktops center:

1. Go to the > Setup > Centers page.

2. Click Add Center.

3. Select Uncategorizd Desktops from the Type drop-down menu.

4. Click Save.

Workstations do not appear in the Uncategorizd Desktops center until you install a Leostream Agent on the machine (see Step 5: Installing the Leostream Agent on Workstations).

Removing Duplicate Desktop Records

If you add an Active Directory center and an Uncategorizd Desktops center, you may have desktops that are inventoried twice on the > Resources > Desktops page. The Connection Broker uses information provided by the Leostream Agent to determine which desktop records represent the same desktop and marks the entry in the Uncategorizd Desktops center as a duplicate.

To remove duplicate desktop records, you can remove the desktop records, as follows.

1. Go to the > Resources > Desktops page.

2. From the drop-down menu at the top of the Availability column, select Duplicate, as shown in the following figure.

3. Click the checkbox at the top of the column of check boxes, pointed out in the previous figure.

4. From the drop-down menu at the top of the row of checkboxes, select Remove.
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Do not select Delete. The Delete option is intended for deleting virtual machines from disk.

5. Click OK in the Remove Desktop confirmation dialog that opens.

**Troubleshooting Missing Workstations**

If some workstations are not appearing in your Resources > Desktops list, check for the following conditions.

- Is the workstation powered on?
- Is the Leostream Agent installed and running on the blade? If the workstation is imported using the Uncategorized Desktops center, the Leostream Agent must be installed, running, and able to communicate with the Connection Broker. Stopping and restarting the agent forces the agent to announce itself to the Connection Broker.

To stop and start the agent:
1. Open the Leostream Agent control panel
2. Go to the Status tab
3. Click the Stop and/or Start button.

- Is the DNS SRV record for your Connection Broker configured correctly? If this record is not correct and your Leostream Agents are configured to discover the broker using that record, the agents cannot find the Connection Broker.

If you do not want to use a DNS SRV record for the Connection Broker, you can hard-code the Connection Broker IP address into the Leostream Agent, as follows.

1. Open the Leostream Agent dialog from your machine’s Control Panel.
2. Go to the Options tab.
3. In the Leostream Connection Broker section, uncheck the Obtain Connection Broker address automatically check box.
4. Enter the Connection Broker address and port into the Address and Port edit fields.
5. Click OK.

**Step 5: Installing the Leostream Agent on Workstations**

The Leostream Agent performs the following crucial tasks when managing connections to workstations with installed PCoIP Remote Workstation Cards.

- The Leostream Agent registers with the Connection Broker, resulting in a desktop record in the Uncategorized Desktops center
The Leostream Agent provides information about the installed PCoIP Remote Workstation Card, allowing the Connection Broker to map the PCoIP Remote Workstation Card record in the Connection Broker to the underlying operating system on the workstation.

The Leostream Agent provides single-sign on to the underlying operating system.

When installing the Leostream Agent, ensure that you enter a valid Connection Broker address. The Leostream Agent can locate the Connection Broker through the _connection_broker DNS SRV record. If you do not have a DNS SRV record for the Connection Broker, enter the broker IP address.

Also, ensure the appropriate single sign-on tasks are selected.

- On a Windows operating system, install the Windows version of the Leostream Agent with the Install Credential Provider task selected.
- On a Linux workstation, install the Java version of the Leostream Agent with both the Enable SSO option and Desktop Experience option selected.

See the Leostream Installation Guide for instructions on installing the Leostream Agent. For more information on the Leostream Agent, see the Leostream Agent Administrator’s Guide.

**Step 6: Associating PCoIP Remote Workstation Cards and Desktops**

The Connection Broker automatically attempts to match PCoIP Remote Workstation Cards to the desktop operating system running on the workstation, using information provided by the Leostream Agent.

For TERA 2 PCoIP cards associated with a Windows operating system, you must install the PCoIP Agent on the Windows desktop in order for the Leostream Agent to obtain the information needed to perform the automatic host card mapping.

**Automatic PCoIP Remote Workstation Card Matching for a Windows Desktop**

The Connection Broker uses the following procedure to match PCoIP cards to the correct Windows desktops.

1. Load the PCoIP Devices into the PCoIP Devices center. You can accomplish this step using various methods, as described in Step 2: Registering PCoIP Devices with the Connection Broker. After you load a PCoIP Remote Workstation card into the Connection Broker, the Connection Broker calls the card using either its IP address or hostname, in order to obtain additional host card information, such as MAC address.

2. Install the Leostream Agent on the desktop, or restart the Leostream Agent if it was previously installed. When the Leostream Agent starts, it searches the registry for entries in the following key:

   HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Enum\PCI\

   The Leostream Agent selects entries that contain 6549, 1200, and 2200, the Teradici vendor code,
TERA1 host card code, and TERA2 host card code, respectively.

For TERA2 cards, the Leostream Agent relies on the PCoIP Agent to return information about the PCoIP host card.

3. The Leostream Agent sends the Connection Broker all PCoIP information that can be identified from the registry key or PCoIP Agent, including MAC address. The Leostream Agent cannot retrieve the PCoIP host card name or IP address from the registry.

4. In addition, the Leostream Agent sends desktop information to the Connection Broker, including the desktop hostname and IP address.

5. The Connection Broker matches the PCoIP Remote Workstation card MAC address provided by the Leostream Agent to the MAC address of a card inventoried on the > Resources > PCoIP Host Devices page. Based on the desktop information provided by the Leostream Agent, the Broker maps the identified host card record to the desktop record on the > Resources > Desktops page.

**Automatic PCoIP Remote Workstation Card Mapping for a Linux Desktop**

The Connection Broker uses the following procedure to match PCoIP Remote Workstation cards to the correct Linux desktops.

1. Load the PCoIP Devices into the PCoIP Devices center. You can accomplish this step using various methods, as described in Step 2: Registering PCoIP Devices with the Connection Broker. After you load a PCoIP Remote Workstation card into the Connection Broker, the Connection Broker calls the card using either its IP address or hostname, in order to obtain additional host card information, such as MAC address.

2. Install the Leostream Agent onto the desktop, or restart the Leostream Agent if it was previously installed. When the Leostream Agent starts, it issues the following command to search for Teradici PCI information:

   `lspci -xxxx -d6549:*`

3. The Leostream Agent sends the Connection Broker all PCoIP information that can be identified from the PCI, including MAC address. The Leostream Agent cannot retrieve the PCoIP host card name or IP address from the PCI.

4. In addition, the Leostream Agent sends desktop information to the Connection Broker, including the desktop hostname and IP address.

5. The Connection Broker matches the PCoIP Remote Workstation card’s MAC address provided by the Leostream Agent to the MAC address of a host card inventoried on the > Resources > PCoIP Host Devices page. Based on the desktop information provided by the Leostream Agent, the Connection Broker maps the identified host card record to the desktop record on the > Resources > Desktops page.
Confirming and Editing PCoIP Remote Workstation Card Mappings

To confirm or edit the desktop/PCoIP Remote Workstation card mapping:

1. Go to the > Resources > Desktops page.

2. Select the Edit action associated with the appropriate desktop.

3. Use the drop-down menus in the PCoIP Host Device section to assign PCoIP host card associated with this desktop.
   a. If the desktop contains a single PCoIP host card, select that card from the Primary/Master Host Device drop-down menu.
   b. For desktops with two PCoIP host cards, select the second card from the Secondary/Slave Host Device drop-down menu. Desktops with two PCoIP cards can simultaneously attach to two PCoIP client devices, providing support for larger monitor configurations.

4. Click Save.

⚠️ If the PCoIP Remote Workstation cards are not correctly associated with the appropriate desktops, the Connection Broker cannot use PCoIP to connect a PCoIP client to the desktop.

Step 7: Defining Pools of Desktops

After you create your centers and the Connection Broker registers your desktops, you can combine the desktops into logical groups, or pools. Use pools to create sets of desktops that have similar attributes, or come from the same center.

💡 The Leostream Connection Broker defines a pool as any group of desktops or applications.

To create a new pool:

1. Go to the > Configuration > Pools page.

2. Click Create Pool, as shown in the following figure.
3. Enter the basic pool characteristics, as follows:
   a. **Name**: a unique identifier for this pool
   b. **Subset of pool**: The parent pool from which to draw desktops for this pool
   c. **Define pool using**: The information to use when selecting desktops for this pool

4. Based on your selection in part c of step 3, enter the characteristics that define the pool. For example, if you select **Desktop attributes** from the **Define pool using** drop-down menu, the following figure shows the **Pool Definition** configured to create a pool defined as a subset of the **All Desktops** pool and including all desktops running a Windows operating system.

5. **Click Save**.

After you finish entering your pools, the **Pools** page displays a hierarchy of all available pools. For a complete description of pools, see “Chapter 8: Creating Desktop Pools” chapter in the **Connection Broker Administrator’s Guide**.
Step 8: Defining Pool-Based Plans

After you separate your desktops into pools, define plans that determine how the Connection Broker manages the user’s session.

The Leostream Connection Broker defines a plan as a set of behaviors that can be applied to any number of pools. This step describes three types of plans: 1) Power Control, 2) Release, and 3) Protocol.

Protocol Plans

The Connection Broker always establishes a PCoIP connection when a user logs in at a PCoIP client and connects to a desktop with a PCoIP Remote Workstation card. Users can also log in using Leostream Connect, which launches the connection to the Remote Workstation card using a PCoIP software client When logging in from a PCoIP zero client, the protocol plan is used only to configure the port to check when using backup pools. By default, the Connection Broker checks port 4172. If you want to change the default port:

1. Go to the > Configuration > Protocol Plans page.
2. Click the Create Protocol Plan at the top of the page. The Create Protocol Plan form opens.
3. Scroll down to the Teradici PCoIP Client Configuration section, shown in the following figure.

![Teradici PCoIP Client Configuration](image)

4. Enter the new port in the Alternate port for remote viewer port check edit field.
5. Click Save to save the form.

For more information on backup pools and failover desktops, see “Specifying Backup Pools” in the Connection Broker Administrator’s Guide.

Use the Leostream Connect and Thin Clients Writing to Leostream API section of the form to build a protocol plan for Leostream Connect logins. Set the Priority of the Teradici PCoIP Soft Client to 1, as shown in the following figure, and set the Priority of the remaining protocols to Do not use.
When establishing the connection, Leostream Connect launches the PCoIP software client using the parameters included in the **Command line parameters** field. The default value specifies the IP address of the Remote Workstation Card installed on the user’s desktop, passed to the PCoIP software client using the **--hard-host** parameter.

The PCoIP software client does not accept user credentials. Therefore, to provide single sign-on to the remote desktop, ensure that the user’s policy selects the **Enable single sign-on to desktop console** option.

**NOTE:** The **--quit-after-disconnect** parameter forces the PCoIP software client to close after the PCoIP connection disconnects. This parameter does not close the PCoIP software client when the user logs out of the desktop. Therefore, when the Connection Broker receives a log out notification from the Leostream Agent, the Connection Broker attempts to manually disconnect the PCoIP connection at the Remote Workstation Card, which closes the client.

**Power Control Plans**

Power control plans define what power control action is taken on a desktop when the user disconnects or logs out of the desktop or when the desktop is released to its pool. Available power control plans are shown on the > **Configuration > Power Control Plans** page, shown in the following figure.
New Connection Broker installations contain one default power control plan, called Default. You can create as many additional power control plans as needed for your deployment. To build a new power control plan:

1. Click the Create Power Control Plan link on the > Configuration > Power Control Plans page. The Create Power Control Plan form, shown in the following figure, opens.

   ![Create Power Control Plan Form](image)

   Enter a descriptive name. You’ll refer to this name when assigning the plan to a pool.

   Select the amount of time to wait before changing the desktop’s power state. A wait time of zero tells the Connection Broker to immediately execute the selected power control action.

   Select the power control action to take after the wait time elapses. For the Connection Broker to take actions based on disconnect or idle-time events, you must install the Leostream Agent on that desktop.

2. Enter a unique name for the plan in the Plan name edit field.

3. For each of the remaining sections:
   a. From the Wait drop-down menu, select the time to wait before applying the power action.
   b. From the then drop-down menu, select the power control action to apply. Selecting Do not change power state renders the setting in the Wait drop-down menu irrelevant, as no action is ever taken.

4. Click Save to store the changes or Cancel to return to the > Configuration > Power Control Plans page without creating the plan.

⚠ The desktop must have an installed and running Leostream Agent to allow the Connection Broker to distinguish between user logout and disconnect and to perform actions based on idle time.
Release Plans

Release plans determine how long a desktop remains assigned to a user. When the assignment is broken, the Connection Broker releases the desktop back to its pool, making it available for other users. Available release plans are shown on the > Configuration > Release Plans page, shown in the following figure.

New Connection Broker installations contain one default release plan. The default release plan is designed to keep the user assigned to their desktop until they log out. When the user logs out, the Connection Broker releases the desktop back to its pool. You can create as many additional release plans as needed for your deployment.

For example, the following procedure shows how to build a release plan that forcefully logs the user out an hour after they disconnect from their desktop. The logout event then triggers the When User Logs Out of Desktop section of the release plan, which releases the desktop back to its pool and removes the user’s assignment to the desktop.

1. Click the Create Release Plan link on the > Configuration > Release Plans page. The Create Release Plan form, shown in the following figure, opens. The figure describes additional use cases you can model using Release Plans.
Quick Start

2. Enter a unique name for the plan in the Plan name edit field.

3. In the When User Disconnects from Desktop section, select after 1 hour from the Forced Logout drop-down menu.

4. Click Save.

⚠️ The desktop must have an installed and running Leostream Agent to allow the Connection Broker to distinguish between user logout and disconnect and to perform actions based on idle time.
Chapter 2: Configuring the Connection Broker

Step 9: Defining User Policies

After you define pools and plans, build policies.

The Leostream Connection Broker defines a policy as a set of rules that determine how desktops are offered, connected, and managed for a user, including what specific desktops are offered, which Power Control and Release plans are applied to those desktops, what USB devices the user can access in their remote desktop, and more.

The Connection Broker provides a Default policy that applies if no other policy exists or is applicable. The Default policy assigns one desktop from the All Desktops pool. You can create additional policies, as follows:

You can create additional policies, as follows:

1. Go to the > Configuration > Policies page.
2. Click Create Policy, shown in the following figure.

3. In the Create Policy form, enter a name for the policy in the Policy name edit field. For a discussion of the remaining general policy properties, see the Connection Broker Administrator’s Guide.

4. Scroll down to the When User Logs into Connection Broker sub-section under the Desktop Assignment from Pools header and use the Number of desktops to offer drop-down menu to indicate the number of desktops to offer to a user of this policy.

5. Also in this sub-section, use the Pool menu to select the pool to offer desktops from. When a user is offered this policy, the Connection Broker sorts the desktops in the selected pool based on the
other policy settings, then offers the user the top \( n \) desktops from the pool, where \( n \) is the number selected in the **Number of desktops to offer** drop-down menu.

6. In the **When User is Assigned to Desktop** section, shown in the following figure, select the **Enable single sign-on to desktop** console option to have the Connection Broker pass the user’s credentials to the Leostream Agent for single sign-on.

7. In the **Plans** section, select the protocol, power control, and release plans we created in this example. When the user requests a connection to one of the offered desktops in the pool, the Connection Broker associate these plans with that desktop.

8. Click **Save**.

For a complete description of setting up policies, see “Configuring User Experience by Policy” in the **Connection Broker Administrator’s Guide**.

**Step 10: Assigning Policies to Users**

When a user logs in to the Connection Broker, the Connection Broker searches the authentication servers on the **Setup > Authentication Servers** page for a user that matches the credentials provided by the user.

The Connection Broker then looks on the **Configuration > Assignments** page, shown in the following figure, for the assignment rules associated with the user’s authentication server. For example, if the Connection Broker authenticated the user in the **LEOSTREAM** domain defined on the **Setup > Authentication Servers** page, the Connection Broker would look in the **LEOSTREAM** assignment rules in the following figure.
To assign policies to users in a particular authentication server, click the Edit link associated with that authentication server on the > Configuration > Assignments tab, shown in the previous figure. The Edit Assignment form for this authentication server appears, shown in the following figure.
By default, the Connection Broker matches the selection in the **Group** drop-down menu to the user’s **memberOf** attribute in Active Directory.

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*If you modified your groups since you last signed into your Connection Broker, you must sign out and sign back in to have your Connection Broker reflect the authentication server changes.*

To assign rules based on the user’s group attribute:

1. Select the group attribute from the **Group** drop-down menu
2. If you are using locations, select a location from the **Client Location** drop-down menu
3. Assign permissions to this group and client location pair by selecting an item from the **User Role** drop-down menu
4. Assign a policy to this group and client location pair by selecting an item from the **User Policy** drop-down menu

If you need to assign roles and policies based on a different user attributes, see “Assigning Roles and Policies Based on any Attribute” in Chapter 14 of the **Connection Broker Administrator’s Guide**.
Step 11: Testing User Login

To test your Connection Broker, ensure that users are being correctly assigned to their desktops, as follows:

1. Navigate to the Resources > Users page. As users log into your Leostream environment, their user information is added to this page. You do not need to load users before they can log in.

2. Click Test Login, as shown in the following figure:

3. In the Login Test form that opens, enter the name of the user to test in the User Name edit field.

4. If you are allowing the user to specify their domain, select a domain from the Domain drop-down menu.

5. Use the Filter client list by location drop-down menu to restrict the clients shown in the Clients drop-down menu. You create these locations on the Configuration > Locations page. If you are not using locations, select All.

   See “Creating Locations” in the Connection Broker Administrator’s Guide for more information on client locations.

6. If you have any clients loaded into your Connection Broker, use the Client menu to select the client you want to test this user logging in from.

7. Click Run Test. The Connection Broker searches the authentication server for your user, and then presents a report, for example:
The test login results show the role and policy assigned to the user, and what desktops the user will be offered.
Appendix A: Working with PCoIP Zero Clients

Configuring PCoIP Zero Clients for Leostream Logins

Users can log into Leostream using any PCoIP Zero client.

⚠️ If you previously used the PCoIP zero client in a VMware Horizon View environment, you must reset the PCoIP processor to its factory defaults before you can manage the PCoIP zero client with the Leostream Connection Broker.

To log into Leostream from a PCoIP Zero Client running firmware version 5.x:

1. In the PCoIP client’s Configuration dialog or Web interface, go to > Configuration > Session
2. Set the Connection Type to PCoIP Connection Manager.
3. In the Server URI field, enter the address of your Leostream Connection Broker.
4. Save the changes.

For PCoIP zero clients running firmware version 4.x, you can use the _pcoip-broker DNS SRV record, or manually configure the client, as follows.

1. In the PCoIP client’s Configuration dialog or Web interface, go to > Configuration > Session.
2. From the Session Connection Type drop-down menu, select the Connection Management Interface option.
3. Enter your Connection Broker address in the DNS Name or IP Address edit field.
4. Save the changes.

Firmware version 4.x and the Connection Management Interface is required to use certain Leostream features, described in Appendix B.

You do not need to reboot the PCoIP zero client for the changes to take effect. However, the client does not appear on the > Resources > Clients page until you click Connect on the PCoIP zero client.

If you need to register multiple PCoIP zero clients with the Connection Broker, you can bulk upload clients listed in a CSV-file. See Uploading PCoIP Zero Clients for more information.
Hard Assigning Workstations to PCoIP Zero Clients

You can hard-assign a workstation to a single PCoIP zero client to ensure that any user logging in at that client receives the same desktop.

A user who logs in at a client that is hard-assigned to a desktop is *not* offered their hard-assigned or policy-assigned desktops.

To hard-assign a desktop to a client:

1. Go to the > Resources > Clients page.
2. Select the Edit action for the appropriate client. The Edit Client form opens.
3. Select the Hard-assigned to a specific desktop option from the Desktop assignment mode drop-down menu. The Assigned desktop drop-down menu appears, as shown in the following figure.
4. Select the desktop you want to assign to this client from the Assigned desktop drop-down menu.
5. Click Save. All users that log in at this client receive the same hard-assigned desktop.

For PCoIP Zero clients, you can configure the client to establish the PCoIP connection to that desktop without requiring a preliminary login to the Connection Broker. In this configuration, when the client boots and registers with the Connection Broker, the broker returns the hard-assigned desktop information and the client immediately connects to the desktop.

The user authenticates at the desktop operating system. Direct connections are useful if the desktop operating system requires the user to accept a legal disclaimer prior to logging into the desktop, for example.
Appendix A: Working with PCoIP Zero Clients

To retain the PCoIP connection when the user logs out of the remote operating system select the **Retain console connection (VNC and PCoIP, only)** option in the **Desktop Hard Assignments** section of the user’s policy. With this option selected, the user is returned to the operating system login page, not the client login page.

You configure a client to perform a direct connection, as follows.

1. Go to the > **Resources > Clients** page.

2. Click the **Edit** link associated with the client you want to direct connect to its hard-assigned desktop.

3. In the **Assignment** section of the **Edit Client** form, shown in the following figure, click the **Direct connect client to desktop** option.

   ![Direct connect client to desktop option](image)

   This option does not appear until you switch the **Desktop assignment mode** drop-down menu to **Hard-assigned to specific desktop**. For information on hard-assigning a client to a desktop, see **Hard-Assigning Clients to Desktop**.

4. The Connection Broker requires a policy to define how the hard-assigned desktop is managed. Typically, this policy is determined by the identity of the user who logs into the Connection Broker.

   In direct-connection mode, no user logs into the Connection Broker prior to the desktop connection. Therefore, you must specify the policy to apply in the **Apply policy options from** drop-down menu.

5. Click **Save** on the **Edit Client** form to save the changes.

Use the **Bulk Edit** option to enable direct-connection mode on multiple clients, simultaneously. If the clients are not inventoried in the Connection Broker, upload a CSV-file of client information to create the clients and enable the direct-connection flag, as described in the following section.

**Uploading PCoIP Zero Clients**

You can upload a group of clients into your Connection Broker by uploading a CSV-file of client attributes. Uploading clients is useful if you need to hard-assign clients to particular workstations.

By default, the uploaded CSV-file modifies existing clients, but does not create new clients. To create new
clients, select the **Allow creation of new clients** option, shown in the following figure. Specify new clients using the name, mac, or serial_number field. New clients cannot be created using an id field.

If you do not select the **Allow creation of new clients** option, the Connection Broker provides a message indicating it cannot find the client, and skips that row in the CSV-file.

When uploading client data, the CSV-file must have the following format.

- The CSV-file must be comma delimited
- Quotes must be double quotes
- The first row must contain the field names, separated by commas with no additional blank spaces, and the data must be in the remaining rows
- The field names must match the field names in the client table in the data dictionary
- One of the following fields is required to uniquely identify the client
  - id (for updating existing clients, only)
  - ip (for PCoIP clients, only)
  - name
  - mac
  - serial_number
- Additional modifiable fields are:
  - client_assignment_mode – set to H to hard-assign the client to a desktop
  - client_type – must be set to blade
  - direct_to_host_policy_id – Set to a policy name or policy ID to enable direct-connect to the hard-assigned desktop (see Hard Assigning Desktops to PCoIP Clients)
  - vm_id – indicates the hard-assigned desktop
- The vm_id and direct_to_host_policy_id fields can contain either the numeric ID of the associated record or the name of the associated record

For a list of field names and values in the client table, go to:

https://cb-address/download/account_db.html#client

Where **cb-address** is your Connection Broker address.

After the clients are uploaded, the Connection Broker performs a scan of the PCoIP Devices center. The center scan updates any PCoIP client records running firmware version 4.x with the additional information provided by the client. Also, for clients running firmware version 4.x, if the client is currently set to connect to a host, the Connection Broker switches the client to the Connection Management Interface.
Appendix B: Additional Features for Client Firmware Version 4.x

Updating the Connection Broker Address

For PCoIP zero clients running firmware version 4.x and the Connection Management Interface, you can force the client to communicate with your Connection Broker, as follows:

1. In the Connection Broker, go to the > Resources > Clients page.
2. Edit the client.
3. Select the **Configure client for use with this Connection Broker** option.
4. Click **Save**.

After you click **Save**, the Connection Broker resets the PCoIP client’s Connection Management Interface address to the first valid address from the following sequence.

1. The address located in the **Connection Broker VIP** edit field on the Connection Broker > System > Settings page
2. The address contained in the _connection_broker SRV record
3. The local Connection Broker address

Resetting PCoIP Zero Clients

You can use the **Reset** action on the > Resources > Clients page, shown in the following figure, to reset a PCoIP zero client running firmware version 4.x.
Clicking **Reset** instructs the Connection Broker to reboot the PCoIP zero client, disconnecting any user with an active PCoIP connection at that client. When the user is disconnected, the Connection Broker invokes the **When User Disconnects from Desktop** section of the user’s release plan.

### Receiving Disconnect Notices from a PCoIP Zero Client

Pressing the **Session Disconnect** button on the PCoIP zero client sends a disconnect message to the Connection Broker. The Connection Broker executes the **When User Disconnects from Desktop** section of the Release and Power Control plans associated with the user’s session.

### Multi-Monitor Support with PCoIP Client Binding

TERA 1 PCoIP host cards and PCoIP zero clients running firmware version 4.x can support up to two monitors. To support a quad monitor layout, the desktop must contain two PCoIP host cards, and each of these cards must connect to a unique PCoIP zero client.

To provide a seamless user experience while supporting quad-monitor configurations, you **bind** two PCoIP Zero Clients into a master/slave configuration.

- The **master** PCoIP client connects to the desktop’s primary/master PCoIP host card. End user’s log into the Connection Broker using the keyboard/mouse attached to the master client.

- The **slave** PCoIP client connects to the desktop’s secondary/slave PCoIP host card. When the user logs in through the master client, the slave client automatically connects to its host card without requiring any action from the user.

After the two clients are bound, when the user logs into the master client, the Connection Broker
Appendix B: Additional Features for Client Firmware Version 4.x

automatically connects the slave client to the other PCoIP device, providing single sign-on with quad-monitor support. The following sections describe how to set up your Connection Broker to support these quad-monitor configurations.

Configuring Desktops for Quad-Monitor Support

The first step in configuring any PCoIP deployment is associating the PCoIP host cards with the desktops that contain them. The Connection Broker displays the host cards in the > Resources > PCoIP Host Devices page. In some cases, when the desktop has two host cards, you must manually associate the PCoIP host cards with the desktop, as follows.

1. Go to the Edit Desktop page for the desktop with two PCoIP host cards.

2. Go to the PCoIP Host Device section, shown in the following figure.

3. From the Primary/Master Host Device, select the PCoIP host card to connect to PCoIP desktop portal in the master client device.

4. From the Secondary/Slave Host Device, select the PCoIP host card to connect to PCoIP desktop portal in the slave client device.

5. Click Save.

Desktops with two PCoIP host cards provide quad-monitor support when logged into from a pair of master/slave bonded PCoIP clients.

Manually Binding Two Clients

The > Resources > Clients page contains separate entries for every PCoIP desktop portal card contained in a client device. Therefore, client devices such as Amulet Hotkey quad-head desktop portals, which contain two PCoIP desktop portal cards in a single device, result in two entries on the > Resources > Clients list.

To support quad-monitors with TERA 1 cards, you must bind two PCoIP desktop portal cards into a master/slave configuration. To specify a pair of bonded clients, go to the Edit Client page for the master client. Use the Select slave client drop-down menu in the Client Binding section, shown in the following figure, to select a slave client to bind to this master client.
If you display the **Client Binding** column on the **Clients** page, the Connection Broker displays information about how clients are bound together, including which clients are masters and which are slaves, as shown in the following figure.

![Client Binding](image)

A slave client becomes read-only. If you need to set the screen resolution on the slave client, do so before binding the client to its master. All other settings for the slave client are configured on the **Edit Client** page for the master client.

### Automatically Binding Two Clients

The Connection Broker can automatically bind two PCoIP clients together if the clients have sequential MAC addresses. The Connection Broker always designates the master client as the client with the even MAC address, and the slave client as the client with the sequential odd MAC address.

To turn on automatic bind clients:

1. Go to the > Setup > Centers page.
2. Select the **Edit** action associated with the **PCoIP Devices** center. The **Edit Center** page opens.
3. In the **Automatic Client Bonding** section, select the **Automatically bind PCoIP Devices with sequential MAC addresses**.
4. In the **Minimum MAC address** field, enter an even MAC address to use as the minimum MAC address in the range of clients to bind together. Enter the MAC address as six pairs of characters delimited by colons, dashes, or periods.
5. In the **Maximum MAC address** field, enter an odd MAC address to use as the maximum MAC address in the range of clients to bind together. Enter the MAC address as six pairs of characters delimited by colons, dashes, or periods. For example, if using Amulet Hotkey quad-head desktop portals, the following figure instructs the Connection Broker to bind the PCoIP desktop portal cards in the range 00:17:FD:00:00:00 thru 00:17:FD:FF:FF:FF.
6. Click **Save**.

7. After the **PCoIP Devices** center is saved, select the **Refresh** action associated with the center, to bind any clients already loaded into the Connection Broker.

   The Connection Broker continues to bind new clients every time the **PCoIP Devices** center is refreshed.

### Managing another User’s Resources via PCoIP

If you log into the Connection Broker with a role that has the **Allow user to manage another user’s resources** option selected, PCoIP client devices allow you to log in to the desktops offered to another user. For a description of the feature for managing another user’s resources, see the “Managing Resources” section in the **Leostream Connect Administrator’s Guide and End User’s Manual**.

To manage another user’s resources from a PCoIP client:

1. Log into the PCoIP client using your usual credentials.

2. In the **Select a desktop** dialog, select **Manage desktops >>**.

3. Click **OK**.

4. In the **Manage desktops** dialog that opens, enter the **User name**, **Domain**, and **Location** for the user whose resources you need to manage.

5. Click **OK**. The **Select a desktop** dialog now displays a list of desktops that would be offered to that user.

6. Select the desktop you want to manage and click **OK**.

7. The Connection Broker launches a PCoIP connection to the desktop and prompts you for the username and password to use to log into that desktop.

   Typically, if you are assigned a single desktop, the Connection Broker automatically launches a PCoIP connection to that desktop. However, if you have a role that allows you to manage another user’s desktops, the desktop does not automatically launch. You must launch the desktop from the **Select a desktop** dialog.