PCoIP Grpahics Agent for Windows Administrators' Guide

24.03

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Anyware Standard Agent for Windows 24.03

This documentation is intended for administrators who are deploying the Standard Agent for Windows as part of an HP Anyware deployment. It assumes thorough knowledge of conventions and networking concepts, including firewall configuration.

> **Command-line tools are required**
>
> Although many agent features and settings can be configured using the Windows user interface, some administrative tasks require use of Windows command line tools. Users should be familiar with both *cmd* and *PowerShell*.

About the Anyware Standard Agent for Windows

The Anyware Standard Agent for Windows is part of HP Anyware. It enables users to deliver virtual Windows desktops or custom applications to remote users. End users connect to their virtual desktops with a Anyware client, either directly or via a connection broker.

Administrators can optionally allow end users to customize their desktops and install or uninstall applications.

Typical end users of the Anyware Standard Agent include task workers and knowledge workers who need a Windows desktop, but do not require high-end GPU-powered graphics applications.

A deployed Standard Agent for Windows requires these components:

- **A host machine** which provides the desktop to remote clients. The host can be physical or virtual, in the cloud, or in a data center. See System Requirements for more information.
- **The Standard Agent for Windows software** installed on the host machine.

Where to Find Information about Other Components

This guide describes the Standard Agent for Windows.

For complete information about all of the components used in PCoIP ecosystems, including architectural diagrams and deployment suggestions, see one of the following documents:

HP Anyware architectures and descriptions:

- PCoIP All Access Architecture Guide

For more information about PCoIP clients, see one of the following:

- Anyware client 24.03 for Windows Administrators' Guide
- Anyware client 24.03 for macOS Administrators' Guide
- Anyware client for 24.03 Linux Administrators' Guide
- Tera2 Anyware Zero Client 24.03 Administrators' Guide

For information about HP Anyware licensing, see our Licensing FAQ. Most Anyware systems use Cloud Licensing. For systems using a local License server instead, refer to the following guides:

- License Server Administrators' Guide for *Online Environments*
- License Server Administrators' Guide for *Offline Environments*

What's New in This Release

Release 24.03 of the Standard Agent for Windows includes:

Smart Card Authentication for Enhanced Security

Version 24.03 of the Graphics Agent introduces support smart card authentication. Linux Clients as well as Trusted Zero Clients connecting to agent machines can now connect using smart cards for authentication and SSO (single sign-on). Additionally, agents can read and process smart card information for in-session tasks such as document signing.

Smart card authentication not only adds a layer of security, but also ensures simplified identity management while accessing PCoIP deployments. For information on agent setup required for smart cards authentication, see Configuring the Agent for Smart Card Authentication.

Note: Supported Deployments

Smart card authentication is only supported in deployments where Linux clients and Trusted Zero Clients connect to Windows Standard agents or Windows Graphics agents.

System Requirements

The Standard Agent for Windows depends on the following system capacities and capabilities:

Supported Instance Types

VMware ESXi (6.0+)	KVM	AWS EC2	Microsoft Azure	Google Cloud Platform
VMware Hardware Version 11	QEMU/ KVM	Any instance type	Any instance type	Any instance type *with virtual displays*

Host Instance Requirements

Global instance requirements	
Operating Systems	• Windows 10 21H2, 22H2 (64-bit Professional and Enterprise) • Windows 11 22H2, 23H2 • Windows Server 2019, 2022 (single-user only)
Remote Host Memory	At least *2GB* of RAM is required on the host desktop. The agent should have at least *512MB* of available memory.
Remote Host CPUs	At least 2 CPUs are required on the host desktop. Processors must support Streaming SIMD Extensions (SSE) 4.2. *To use PCoIP Ultra, processors must support the AVX2 instruction set.*
Network Ports	The following ports must be open on the host desktop: • TCP 443 • TCP 4172 • UDP 4172 • TCP 60443 Collaboration sessions require an open UDP port (default 64172)
Storage	At least 100MB for installation and 100MB for logging are recommended.

Using a standalone physical PC

You can enable PCoIP connections to a standalone computer, without a discreet GPU, via the Standard Agent for Windows. Standalone physical PCs are currently not tested, but are expected to work. For more information and instructions, see HP Anyware Instructions for Standalone Computers in the HP Knowledge Base.

Note: Elastic GPU and other EC2 instances supported

The Standard Agent for Windows supports a variety of EC2 instances, including elastic GPU types such as eg1.large. Refer to Amazon EC2 Elastic GPUs documentation for more information.

Feature Support

Audio Support

Stereo audio output and mono audio input are supported and enabled by default.

During a session, the host's default audio device is changed to the *Teradici Virtual Audio Driver*. When the session is disconnected, the audio device selection reverts to its previous setting.

> **Note: Applications must use the system default device**
>
> The Anyware agent delivers audio over PCoIP connections by reassigning the system's default audio device. Only applications that use the system default audio device will send or receive audio over PCoIP.

> **Note: Volume is set to full when the Anyware agent is installed**
>
> When the Anyware agent is installed, the system volume is reset to maximum. Test the volume level before use.

Multi-Channel Audio Output

Requirements

- **Agent**: Standard Agent for Windows, version 22.04 or newer
- **Client**: Anyware Client for macOS, version 22.01 or newer

> **Important: macOS Client is required**
>
> Multi-channel audio is only supported by the Anyware Client for macOS.

- **Audio device**: Multi-Channel Audio device that supports 2.0, 5.1 or 7.1 channel configuration (connected to Anyware Client for macOS)

Current Limitations

- Only **2.0**, **5.1**, and **7.1** configurations are currently supported.
- Individual speaker volume control is currently only available for 2.0 configurations.
- Multi-channel audio does not work on Avid Media Composer.

Enabling Multi-Channel Audio

To use multi-channel audio in a PCoIP session, the client Mac must be connected to a multi-channel audio device that is set as the system default. When a configured client establishes a PCoIP connection, the Standard Agent for Windows will automatically detect the multi-channel system.

See the Anyware Software Client for macOS Administrators' Guide for setup instructions.

Collaboration

PCoIP Ultra Collaboration enables a PCoIP session user to share their session with multiple remote collaborators using Anyware Software Clients.

> **Note: Collaboration terminology**
>
> When discussing this feature, we'll refer to the first user as the *session owner*, and subsequent users who join the session as *collaborators*. The session owner's screens, audio, and input devices (if allowed) are shared with the collaborators when they join the session.

Up to 5 collaborators can join an ongoing PCoIP session using the same invitation. The maximum number of collaborators can be reduced by configuring the agent.

> **Warning: Consider system resources**
>
> As the number of collaborators increases, the load on the Anyware agent's CPU, memory, and other resources will also increase. Test your system to ensure it can support all of your planned collaborators.

While connected, all collaborators can view and hear the session owner's screens and audio, and see the controlling collaborator's mouse movements. If permitted by the session owner, they can also share control of the session owner's keyboard and mouse using input control.

During a collaboration session, *all* of the session owner's desktop screens may be shared depending on the session owner's Anyware software client display settings. See Understanding Display Behavior for more information.

Collaboration Requirements

PCoIP Ultra Collaboration is supported by all Anyware agents. Anyware software clients that support PCoIP Ultra can participate in collaboration sessions (all Anyware software clients 23.04 and higher meet this requirement).

Some collaboration features have specific version requirements for Anyware agents and Anyware software clients; these are noted below.

✎ **Note: Only Anyware Software Clients are supported**

Anyware Tera2 Zero Clients and mobile clients do not support PCoIP Ultra and cannot join collaboration sessions.

Feature Version Requirements

PCoIP Ultra Collaboration features depend on coordinated updates in Anyware agents and Anyware clients, so review these requirements carefully to ensure the features you need are supported by your system. **We strongly recommend using the latest versions of both Anyware agent and Anyware client**.

Feature	Required versions	Notes
Collaborate menu	Anyware agent 23.06+ Anyware client 23.06+	Both client and agent must be 23.06 or higher, with Collaboration and PCoIP Ultra enabled.
Multiple collaborators	Anyware agent 23.04+ Anyware client 23.04+	HP Anyware versions 22.07–23.01 supported single collaborators only.
Input control	Anyware agent 23.01+ Anyware client 23.01+	See Input Control for more information.
Mouse visibility	Anyware agent 22.07+ Anyware client 22.07+	Session owner and collaborator software clients must be in *standard client mode* for mouse visibility to work.

Network Requirements

Each collaborator connection requires a separate UDP port. These ports are assigned in a range that *begins* with the configured UDP port (by default, 64172), and increments with each additional collaborator. All ports in this range must be open, both at the cloud provider network level and the local firewall at the host.

For example, using the default configuration and hosting three collaborators, the system would require inbound UDP ports 64172, 64173, and 64174 to be open.

Maximum number of collaborators	Required inbound UDP ports
1	64172
2	64172-64173
3	64172-64174
4	64172-64175
5 (default)	64172-64176

You can change the starting port number if desired. If you change the configured starting UDP port, adjust these ranges and ensure your host firewall configuration allows traffic on the new ports.

For direct connections, or brokered connections that do not use a Security Gateway, each collaborator's Anyware client must be able to reach these ports. For brokered connections using a Security Gateway, only the Security Gateway must be able to reach them.

Enabling Collaboration

> **Important: Anyware agent steps**
>
> Collaboration sessions are enabled and configured on the Anyware agent machine before starting collaboration sessions. Make sure the Anyware agent version you are using supports the collaboration features you expect. For details, see Feature Version Requirements.
>
> The following steps apply to the session owner's desktop machine.

PCoIP Ultra Collaboration is enabled, disabled, and configured on the Anyware agent machine. It is disabled by default, and must be enabled by activating both *PCoIP Ultra* and *Collaboration* on the remote desktop.

To enable PCoIP Ultra Collaboration:

1. Open the Local Group Policy Editor on the agent machine:
   a. Press ⊞ + `r` to open the run dialog
   b. type `gpedit.msc` and press `Enter`.

2. Navigate to **Computer Configuration** > **Administrative Templates** > **PCoIP Session Variables** > **Non Overridable Administrator Settings**.
3. Select **Configure PCoIP Ultra**.
4. Click **Enabled**, and select one of the available PCoIP Ultra offload modes:

Agent type	Valid PCoIP Ultra Offload modes
Standard Agents	PCoIP Ultra CPU Offload
Graphics Agents	PCoIP Ultra CPU Offload, PCoIP Ultra GPU Offload, or PCoIP Ultra Auto Offload

5. Select **Configure user collaboration** in the GPO list and click **Enabled**.
6. **Optional**: To enable *Collaboration Input Control* if desired, stay in the GPO editor and follow the instructions in Enabling Input Control below.
7. **Optional**: You can change the UDP starting port if needed (the default starting port is UDP 64172). If you need to change the collaboration port number, stay in the GPO editor and:
   a. Set the value to the new collaborator port number which can be found under the Options section.
8. Close the GPO editor.
9. Restart the Anyware agent.

See Configuration Guide - Configurable Settings for more detailed information on setting configuration values.

Input Control

Collaborator input control allows collaborators to use their own mice and keyboards to control the session owner's desktop. **This feature is disabled by default**, and must be enabled on the Anyware agent before it is available.

ENABLING INPUT CONTROL

Input control is disabled by default, and the option to give collaborators input control cannot be selected.

To use Input Control, enable it on the Anyware agent. This change takes effect on the next PCoIP session:

1. Open the Local Group Policy Editor on the agent machine:
    a. Press ⊞ + `r` to open the run dialog
    b. type `gpedit.msc` and press `Enter`.
2. Navigate to **Computer Configuration** > **Administrative Templates** > **PCoIP Session Variables** > **Not Overridable Administrator Settings**.
3. Select **Configure collaboration input control**.
4. Enable input control.
5. **Optional:** provide a custom input control timeout value (specified in milliseconds; 3000ms is 3 seconds).
6. Close the GPO editor.

DISABLING INPUT CONTROL

If Input Control has been enabled and you wish to disable it again:

1. Open the Local Group Policy Editor on the agent machine:
    a. Press ⊞ + `r` to open the run dialog
    b. type `gpedit.msc` and press `Enter`.
2. Navigate to **Computer Configuration** > **Administrative Templates** > **PCoIP Session Variables** > **Not Overridable Administrator Settings**.
3. Select **Configure collaboration input control**.
4. Disable input control.
5. Close the GPO editor.

Configuring Collaboration

Changing the Collaboration Starting Port

The default *starting* UDP Port for collaborator sessions is 64172. You can change this value if needed. Remember that you must also open a range of UDP ports that *begin* with this value to accommodate all of your collaborators; see Network Requirements for examples.

To change the Collaboration session port:

1. Open the Local Group Policy Editor on the agent machine:
   a. Press ⊞ + `r` to open the run dialog
   b. type `gpedit.msc` and press `Enter`.
2. Navigate to **Computer Configuration** > **Administrative Templates** > **PCoIP Session Variables** > **Non Overridable Administrator Settings**.
3. Select **Configure user collaboration**.
4. Ensure that it is set to **Enabled**.
5. Enter the new starting UDP port used by collaborator session.
6. Close the GPO Editor.
7. Restart the Anyware agent service.

Changing the Maximum Number of Collaborators

PCoIP Ultra Collaboration supports up to 5 collaborators on the same PCoIP session. You can further limit the number of allowed collaborators by changing the *maximum collaborators* setting to a value from 1-5. By default, the system allows 5 collaborators.

To Change the Maximum Number of Collaborators:

1. Open the Local Group Policy Editor on the agent machine:
   a. Press ⊞ + `r` to open the run dialog
   b. type `gpedit.msc` and press `Enter`.
2. Navigate to **Computer Configuration** > **Administrative Templates** > **PCoIP Session Variables** > **Not Overridable Administrator Settings**.

3. Select **Configure collaboration**.
4. Confirm that collaboration is enabled; if it is not, enable it.
5. Enter a new maximum number of collaborators.
6. Close the GPO editor.
7. Restart the Anyware Agent service.

Changing the Input Control Timeout Value

Input control is released and made available to other collaborators by idling all input devices for a brief period. By default, this control timeout is 3 seconds (3000ms). You can change this value by configuring the Anyware agent machine as follows:

1. Open the Local Group Policy Editor on the agent machine:
    a. Press ⊞ + `r` to open the run dialog
    b. type `gpedit.msc` and press `Enter`.
2. Navigate to **Computer Configuration** > **Administrative Templates** > **PCoIP Session Variables** > **Not Overridable Administrator Settings**.
3. Select **Configure collaboration input control**.
4. Enter a new input control timeout value (specified in milliseconds; 3000ms is 3 seconds).
5. Close the GPO editor.
6. Restart the Anyware agent service.

Sharing Your Session With Collaborators

You can invite up to 5 collaborators to participate in your session, and optionally allow them to control your desktop.

> **Important: Anyware Client steps**
>
> Collaboration sessions are shared from Anyware clients in established PCoIP sessions. Make sure the software client version you are using supports the collaboration features you expect. For details, see Feature Version Requirements.

Collaboration sessions are managed using the **Collaboration manager**. The collaboration manager shows you who is connected to your session, whether each collaborators can view or control the session, and allows you to invite new collaborators or stop collaborating.

> **Note: New Collaboration Manager menu option**
>
> The Collaboration manager can now be launched by using the client's in-session menu, in addition to the system menu bar.

To launch the Collaboration Manager:

1. Connect to a PCoIP session with PCoIP Ultra and Collaboration enabled.
2. From the remote session, open the **Collaboration Manager** using either of these methods:
    - **From the client menu:** From the client's in-session menu, select **Collaborate** > **Invite to Collaborate**.

      Collaboration Manager Menu Option

      The Collaborate menu appears if both the Anyware agent and Anyware client are version 23.06 and higher, and if both support Collaboration.
    - **From the menu bar:** Click the **Anyware Collaboration** icon in the menu bar:

      Launch collaboration manager

      This example shows a Windows desktop; yours may vary depending on which operating system you are connecting to.

To invite collaborators, the session owner generates a *collaboration invitation* using the collaboration manager, and distributes the invitation to all collaborators.

About Collaboration Invitations

Collaboration invitations are created by the session owner and distributed to collaborators, who use them to join an established collaboration session.

Note: About collaboration invitations

A single collaboration invitation can be used by multiple collaborators (up to the maximum number configured). You do not need to generate a new invitation for each collaborator. Collaboration invitations behave as follows:

- If an invitation is generated but no collaborators connect within one hour, it expires and can no longer be used. If this happens, generate a new invitation.
- If *any* collaborators connect using an invitation, the invitation is activated and its time limit is removed. Once activated, an invitation can be re-used until the session owner stops collaborating or ends the session.
- Collaborators can disconnect from a collaboration session and then rejoin it later using the same invitation.
- Collaboration sessions persist even if all collaborators leave and only the session owner remains. Until the session owner disconnects or stops the collaboration session, collaborators can rejoin the session using the same invitation.
- The collaboration invitation remains valid until the session owner disconnects or stops the collaboration session.

Generating Collaboration Invitations

Collaboration invitations are used by collaborators to join an established collaboration session.

To generate a collaboration invitation:

1. Connect to a PCoIP session with PCoIP Ultra and Collaboration enabled.
2. From the remote session, open the **Collaboration Manager** using either of these methods:
   - **From the client menu:** From the client's in-session menu, select **Collaborate** > **Invite to Collaborate**.

     Collaboration Manager Menu Option

     The Collaborate menu appears if both the Anyware agent and Anyware client are version 23.06 and higher, and if both support Collaboration.
   - **From the menu bar:** Click the **Anyware Collaboration** icon in the menu bar:

     Launch collaboration manager

This example shows a Windows desktop; yours may vary depending on which operating system you are connecting to.

3. The Collaboration manager generates and displays an invitation:

   Collaboration invitation

   The invitation contains two pieces of information that are used to invite the collaborator:

   - **Invitation Link**: The collaborator will use this link to join your session. The link may be opened on any Mac, Windows or Linux machine with a Anyware Client 21.07 or newer.
   - **Invitation passcode**: This is a 6-digit code that confirms the identity of the individual connecting to the collaboration session. A new code is generated along with each new token.

4. Share the *invitation link* and the *invitation passcode* with the collaborator.

   - To share both the link and the code at once, click the **Copy invitation** button. This will create a single message containing both the link and the code and place it on your clipboard. Share this with your collaborators using any acceptable method.
   - To share the link and code *separately*, click the *copy* button beside each item and share them using separate communications. Sharing the invitation this way reduces risk in the event that a message is inadvertently sent, forwarded, or intercepted by a third party.

Inviting Additional Collaborators

Once the collaboration session has been created, you can invite additional collaborators by sharing the same invitation link and passcode with them. You can also view the invitation, and copy its link and passcode for sharing, using the Collaboration Manager.

To view and copy the invitation link and passcode:

1. From the remote session, open the **Collaboration Manager** using either of these methods:

   - **From the client menu:** From the client's in-session menu, select **Collaborate** > **Invite to Collaborate**.

     Collaboration Manager Menu Option

     The Collaborate menu appears if both the Anyware agent and Anyware client are version 23.06 and higher, and if both support Collaboration.
   - **From the menu bar:** Click the **Anyware Collaboration** icon in the menu bar:

Launch collaboration manager

The collaboration manager shows a list of your active collaborators (if any).

2. In the Collaboration manager, below the list of active collaborators, click **Invite Collaborator**:

   Collaboration Manager with No Collaborators

3. The Collaboration manager displays the generated invitation. Note that this is the *same* invitation link and passcode you used previously. It is not a new invitation:

   Collaboration invitation

4. Share the *invitation link* and the *invitation passcode* with the additional collaborators.

Accepting or Declining Collaborators

Once distributed, the session owner's collaborators can join the collaboration session. As collaborators use the invitation, the session owner is notified and can accept or reject each connection attempt.

To respond to a collaborator:

1. When the collaborator attempts to join the session, the Collaboration manager will display options to accept or reject the connection.

   Accept or reject the invitation

2. Click **Accept** to start the collaboration session. Click **Decline** to deny the request. Whether you accept the request or not, the invitation has been used and is now disabled. Subsequent attempts will require a new invitation.

Ending a Collaboration Session

The collaboration session will end when the session owner disconnects their PCoIP session, or if they stop collaborating using the collaboration manager.

Ending the collaboration session invalidates the invitation. To start a new session, generate a new invitation by inviting another collaborator.

To stop collaborating:

1. From the remote session, open the **Collaboration Manager** using either of these methods:
   - **From the client menu:** From the client's in-session menu, select **Collaborate** > **Invite to Collaborate**.

     Collaboration Manager Menu Option

     The Collaborate menu appears if both the Anyware agent and Anyware client are version 23.06 and higher, and if both support Collaboration.
   - **From the menu bar:** Click the **Anyware Collaboration** icon in the menu bar:

     Launch collaboration manager

     This example shows a Windows desktop; yours may vary depending on which operating system you are connecting to.
2. Click the **Stop Collaboration** button.

   Stop collaborating

Allowing Collaborators to Control the Session

Collaborator input control allows collaborators to use their own mice and keyboards to control the session owner's desktop. **This feature is disabled by default**, and must be enabled on the Anyware agent before it is available.

Once enabled, input control options are available from the collaboration manager. Input control can be granted (or retracted) for each user separately or for all users at once.

> **Note: Disabling input control globally**
>
> You can disable Input Control on the Anyware agent, which turns the feature off entirely. When disabled this way, session owners will not be able to allow collaborators to take control, and all sessions will be view-only. For more information, see Disabling Input Control.

Important: The session owner always has control of their Anyware client's in-session menu

The session owner always has control of their Anyware client's in-session menu. If the owner is unable to reclaim session input control for any reason, they can disconnect the Anywaresession using the in-session menu option. When the owner disconnects from the session, the collaborator is immediately disconnected.

ENABLING INPUT CONTROL FOR COLLABORATORS

The following steps will allow one or more collaborators to take control of the session desktop. The collaborators will not immediately have control when this is granted; they must still take control using the process described above.

This option will not be available if Input Control has been disabled on the Anyware agent.

To allow collaborators to control the session desktop:

1. From an active collaboration session, open the collaboration manager.
2. Grant input control using one of these methods:
    - To allow input control for *all collaborators*, click the dropdown menu at the top right and select **All can control**.

      Grant control permission to all collaborators
    - To allow input for *one collaborator*, click the dropdown menu beside the collaborator's name and select **Can control**.

STOPPING INPUT CONTROL

To return a user (or all users) to view-only mode:

1. From an active collaboration session, open the collaboration manager.
2. Beside the collaborator's name, click the dropdown menu and select **Can View**.

Understanding Display Behavior

Collaboration sessions support sharing of multiple monitors, which varies by session owner's client setting as follows:

- **Windowed mode**: The session in the owner's client window will be shared.
- **Fullscreen One Monitor**: The single fullscreen session will be shared. The session owner should set their Anyware Client to *Fullscreen One Monitor* mode prior to starting the collaboration session.
- **Fullscreen All Monitors**: All monitors will be shared, beginning with the Session Owner's monitor 1 and continuing up to the number of displays in the collaborator's system. The monitors that are shared cannot be configured, and are shared in system order.

  *When using this mode, the session owner should assume that collaborators can see **all** displays unless a specific configuration has been tested and verified.*

  For example, if the session owner has four monitors and a collaborator only has two, the collaborator will see the session owner's first and second monitors. If different collaborators have a different number of screens, each will see as many displays their system supports; in this scenario, you may have some displays that are visible to certain collaborators but not others.

  The session owner should set their Anyware Client to *Fullscreen All Monitors* mode prior to starting the collaboration session.

If the session owner's and collaborator's screen resolutions are different, the collaborator's screen will use scrollbars and letterboxing to display the shared content.

If *high performance client* mode is enabled, and if the session owner's resolution is greater than the collaborator's, the collaborator's screen will be clipped instead.

Joining a Collaboration Session

Collaborators receive the invitations generated by session owners, and use the invitation URI and passcode to connect to the session.

> **Important: Anyware Client steps**
>
> Collaborators join sessions using Anyware clients. Make sure the software client version you are using supports the collaboration features you require. For details, see Feature Version Requirements.

Each collaborator can join the session with the collaboration link and the Collaboration Invitation passcode. The same URI and passcode are used for all collaborators on the same session.

To join a collaboration session as a collaborator:

1. Open a web browser and go to the collaboration link shared with you (you may be able to click this link directly, depending on how it was shared with you).
2. The web browser will warn you that the link is attempting to open the *Anyware Client* application. Allow the browser to open the Anyware client.
3. When the Anyware client opens, it will prompt you for your name and the Collaboration Invitation passcode. The name you provide here will identify you in the collaboration session. The collaboration invitation passcode is the six digit number provided by the session owner. Enter both values and click **Submit**.
4. Once the session owner accepts your connection request, the Collaboaration screen share will start.
5. To leave the collaboration session, select **Connection** > **Disconnect** from the Anyware Client menu.

Collaborator Input Control

If the session owner has enabled input control for a collaborator, the collaborator can take control of the session owner's desktop including mouse, keyboard, and pointer activity. The session owner retains the ability to stop input control at any time.

USING INPUT CONTROL AS A COLLABORATOR

A collaborator who has input control can release it by idling—stopping all keyboard, mouse, and pointer activity—for a short time. Once the control timeout has elapsed, the floor is open, and whichever collaborator provides input next takes control.

By default, the control timeout is 3 seconds. The timeout value can be configured when enabling the input control feature.

For example: the session owner has initial control of the session. In order to give control to the collaborator, the owner takes their hands off the keyboard and mouse for three seconds, allowing the control timeout to pass. A collaborator then moves their mouse, which gives them control. To give control back to the session owner, the collaborator takes their hands off their keyboard and mouse for three seconds. This exchange continues as long as needed.

Displays

The Standard Agent for Windows supports a maximum of four displays on the Anyware client, and a maximum resolution of 4K UHD (3840×2160).

Monitors can be arranged in a vertical line, a horizontal line, or as a 2×2 box display. They can be used in any standard rotation (0°, 90°, 180°, or 270°), with any monitor as the primary display.

Note: Using multiple high-resolution displays

Systems with multiple high-resolution displays, such as quad 4K UHD topologies, require powerful system infrastructure. Be sure to use a system with sufficient bandwidth, client capabilities, and host capabilities to support your required display topology.

Important: Attaching monitors to the host machine in not supported

Anyware client supports a maximum of four displays. Attaching extra monitors to the host machine will conflict with client display topologies.

Supported Installer Languages

The Anyware agent installer supports the following languages:

- French
- German
- Spanish
- Simplified Chinese
- Traditional Chinese
- Japanese
- Portuguese
- Italian
- Korean
- Russian
- Turkish

PCoIP Ultra

The Standard Agent for Windows provides support for PCoIP Ultra. PCoIP Ultra is optimized for truly lossless support with bit-exact color accuracy and preservation of content detail at the highest frame rates.

PCoIP Ultra protocol enhancements propels our industry-recognized performance into the future of remote computing, with faster, more interactive experience for users of remote workstations working with high-resolution content.

PCoIP Ultra now defaults to "Auto Offload" on Graphics agent machines, provided that both the client machines and the agent machines are capable of supporting CPU Offload as well as GPU Offload. Additionally, **YUV Chroma subsampling defaults to 4:2:0**. This ensures higher framerates of graphics and optimized motion content, while ensuring efficient utilization of bandwidth.

Note: PCoIP Ultra Default Value

For most users, the default PCoIP Ultra value will provide the best possible experience. Carefully review the recommended use cases in the next section to determine whether you should change the PCoIP Ultra value.

For additional detail on PCoIP Ultra technical requirements for various use cases and troubleshooting steps, refer to KB 2109: PCoIP Ultra Troubleshooting.

When to Enable PCoIP Ultra

PCoIP Ultra provides efficient scaling across multicore CPUs, leveraging AVX2 instruction sets. Appropriate for users that require CPU-optimized delivery of 4K UHD, high-framerate video playback and build-to-lossless color accuracy.

For *all other scenarios*, we recommend that you leave PCoIP Ultra disabled.

Requirements

To take advantage of PCoIP Ultra, you need:

- An **Anyware agent** (any supported version)
- An **Anyware Software Client** (any supported version)

> **Anyware Tera2 Zero Clients are not supported**
>
> PCoIP Ultra is supported by Anyware Software Clients only. Anyware Tera2 Zero Clients cannot use PCoIP Ultra.

- The CPUs on both the agent and the client machines must support the AVX2 instruction set.

Enabling PCoIP Ultra

To enable PCoIP Ultra features, edit your GPO settings and set a `Ultra` mode as required:

- **CPU Offload** To turn on *PCoIP Ultra CPU Offload*. CPU offload requires CPU support for the AVX2 instruction set on both the remote host and client. The Anyware Zero client is not supported. CPU offload is recommended for 4K UHD resolutions with video playback requirements of 30 fps (or more), and the highest possible image quality and color accuracy.

All PCoIP Ultra settings take effect on the next PCoIP session. No configuration is required on the Anyware Software Client.

> **Turning PCoIP Ultra off**
>
> To disable PCoIP Ultra, set the `Ultra` GPO setting to `disabled`.

> **Setting GPO variables**
>
> If you don't know how to enable GPO variables, refer to Configuring the Standard Agent for Windows.

Printing Support

The Standard Agent for Windows supports printing from local printers connected to Anyware clients. Similarly, printing from USB printers that are connected by means of the USB Bridging feature is also supported. Additionally, an agent can also issue print jobs on printers connected to its local area network.

Refer to the following table for local printing support.

Cloud printing is available from all clients if supported by the desktop system.

	Zero Client	Software Client	Mobile Client
Printing from a USB Printer	✔ Printer is connected to a USB port on the zero client	✔ printer is connected to a USB port on the client computer	— Printing is not supported on mobile clients.
Printing from a Local Client Machine	—	✔	—
Printing using a Cloud Service	✔	✔	✔
Printing from Agent Machine	✔	✔	✔

Smart Cards

Enabling Smart Card Authentication Using Tera2 Zero Clients

Smart Cards, such as PIV cards, may be used to authenticate to your PCoIP Session. Smart Card support requires a Anyware agent and a Anyware Tera2 Zero Client for direct (unbrokered) connections. For brokered connections, a Connection Manager & Security Gateway *and* a Leostream broker are also required, in addition to the Anyware agent and Anyware Tera2 Zero Client.

Requirements

Component		Version
Client	Anyware Tera2 Zero Client	Firmware 21.01+
Infrastructure	*(required for brokered connections only, not required for direct connections)* • Connection Manager & Security Gateway 20.07+ • Leostream broker	
Host	Anyware Standard or Graphics Agent for Windows	21.03+
	ActivClient Middleware	7.1, 7.2

Notes and Limitations

- Smart Card Authentication works only with the Anyware Standard Agent for Windows and the Anyware Graphics Agent for Windows.
- Smart Card authentication can only be enabled or disabled during installation. If the Anyware agent has already been installed, re-install the software using the instructions below.
- The interface-driven installer for the Standard Agent for Windows cannot enable this functionality. You must use the scripted (silent) installer.
- We have tested ActivClient 7.1 and 7.2; other versions may work but have not been tested.
- While in a PCoIP session, the remote desktop's Device Manager will show *two* identical smart cards. This is expected and does not affect the session.

Setup

Before you begin, make sure your installed components meet the minimum requirements described above, and ensure your smart card is configured correctly.

To configure the remote machine:

1. Connect to the remote machine via RDP.
2. On the remote machine, install the Standard Agent for Windows using the `/InstallVSCReader` argument.

    - **Windows BAT**: Open a Windows command line tool and enter the following:

      ```
      start /WAIT <path_to_installer> /S /NoPostReboot /InstallVSCReader
      echo %ERRORLEVEL%
      ```

      ...where `<path_to_installer>` is the system filepath of the installer file.

    - **Windows PowerShell**: Open a PowerShell window and enter the following:

      ```
      $process = Start-Process -FilePath <path_to_installer> -ArgumentList "/
      S /NoPostReboot /InstallVSCReader _?<path_to_installer>" -Wait -
      PassThru; $process.ExitCode
      ```

      ...where `<path_to_installer>` is the system filepath of the installer file. Note that this argument is used twice!

3. Configure the Standard Agent for Windows license information, as described here.
4. Install the ActivClient middleware (available from your SmartCard vendor) on the host machine.

Middleware installation notes

- ActivClient middleware must be installed in a console session.
- To prevent conflicts, only one middleware should be installed.

5. Reboot the remote machine.

To configure the Anyware Tera2 Zero Client:

1. Update the device's firmware to the latest available version.

2. Configure the device to connect to the remote machine (normally, the default *auto-detect* mode is best).

Connecting

Once the agent and Anyware Tera2 Zero Client are prepared as described, you can connect to a PCoIP session by inserting a SmartCard into the card reader attached to the Anyware Tera2 Zero Client.

To connect to the PCoIP session using the smart card:

1. Plug the smart card reader into the Anyware Tera2 Zero Client.
2. Plug the smart card into the AnywareP Tera2 Zero Client.
3. Enter the IP address of the remote host machine.
4. If required, enter your PIN or credentials when prompted. For detailed instructions, refer to Connecting to a Session Using Smart Cards in the Anyware Zero Client Firmware Administrators' Guide.

Using the Smart Card in a PCoIP Session

You can also use your smart card within a PCoIP session, to authenticate to applications on the remote desktop.

To use your smart card in-session:

1. Attach the smart card reader to the Anyware Tera2 Zero Client.
2. Add your reader to the Anyware Tera2 Zero Client's *Bridged Devices* table.
    a. Log in to the Zero Client's *Administrative Web Interface*.
    b. Select **Configuration** > **USB**.
    c. In the *Bridged Devices* section, click **Add New** and add your reader.

Removing Smart Card Support

In order to remove support for Smart Card Authentication, uninstall the agent and then re-install it without using the `/InstallVSCReader` option.

Enabling Smart Card Authentication Using Linux Clients

Pre-session smart card authentication is supported while connecting from Linux Clients to Windows Graphics agents. The following section contains information on system requirements, limitations, and agent setup.

> **Note: Broker Configuration**
>
> Smart card authentication is supported with the Leostream broker or when directly connecting from the client machine to the agent machine. However, if the **Subject Alternative Name** in the Smart Card certificate is in the <valid username>@<valid domain> format, direct connections are not supported. You must use the Leostream connection Broker version 2023.2.3.4 and Connection Manager version 23.12 or later in this scenario. For more information, see Configure the Leostream Connection Broker.

Requirements

Component		Version
Client	Anyware Linux Client	24.03+
Agent	• Graphics Agent for Windows • Standard Agent for Windows	24.03+
Infrastructure	*(required for brokered connections only, not required for direct connections)* • Connection Manager & Security Gateway 20.07+ • Leostream broker	
Host	Anyware Standard or Graphics Agent for Windows	21.03+
	ActivClient Middleware	7.1, 7.2

Anyware Graphics Agent

Smart Card Authentication is supported while connecting to Windows agent 24.03 or later.

Anyware Client

At this time, smart Card Authentication is only supported while connecting from **Linux Client version 24.03 or later**.

Smart Card Certificate Requirements

The smart card certificate prerequisites are as follows:

- Key usage is set to digital signature
- Subject common name and/or subject alternative name (other name) are set
- Enhanced key usage must include client authentication and/or smart card logon
- Key length must not be larger than 2048 bit

SMART CARD READERS

The following smart card readers have been tested:

- Belkin USB Smart Card Reader (F1DN008U)
- Identiv SCR3310 USB Contact Smart Card Reader

TESTED SMART CARD MODELS

This version of Linux Clients supports both pre-session authentication and in-session use of smart cards. The following smart card models have been tested:

Product Name	Type of Card	Notes
Gemalto TOP DL V2.1 144K FIPS	CAC	
IDEMIA Cosmo v8.0	Alternate token	
IDEMIA ID-one 125 V8.0D	CAC	
G+D Sm@rtCafe Expert v7.0	CAC	
G+D Sm@rtCafe Expert v7.0 144K DI	CAC	
PIVkey C910	PIV	
PIVkey C980	PIV	
PIVkey C990	PIV	
Yubikey 5C		Using PIV interface.
Yubikey 5 NFC		Using PIV interface.

Note: Testing Smart Card Solutions

Solutions must be validated in user environments before selecting a solution, as environmental differences including network conditions or other components may impact support.

Notes

- Smart Card Authentication works only with the Anyware Standard Agent for Windows and the Anyware Graphics Agent for Windows.
- Smart Card authentication can only be enabled or disabled during installation. If the Anyware agent has already been installed, re-install the software using the instructions below.
- The interface-driven installer for the Standard Agent for Windows cannot enable this functionality. You must use the scripted (silent) installer.
- At present, simultaneous configuration of a single card and single reader is supported.
- We have tested ActivClient 7.4.3.13; other versions may work but have not been tested.

- While in a PCoIP session, the remote desktop's Device Manager will show *two* identical smart cards. This is expected and does not affect the session.

Known Limitations

- The Interactive logon: Smart card removal behavior is not supported during smart card sessions.
- When authenticated using smart cards, Anyware Clients cannot recognize HP Digital Badges.
- Concurrent users cannot log on to agent machines using the same smart card for authentication. Smart cards having multiple certificates allow only one user to log on at a time. to be able to log in, others users must wait until the current users logs off.

Agent Setup

Note: Installing Card Reader Drivers

Some card readers might require their drivers to be installed on the agent machine. Consult with the reader manual to determine whether you need to install the required drivers.

1. Make sure that you downloaded Anyware Agent 24.03 or later to the remote machine.
2. Connect to the remote machine via RDP.
3. On the remote machine, install the Standard Agent for Windows using the `/InstallVSCReader` argument.

   - **Windows BAT**: Open a Windows command line tool and enter the following:

   ```
   start /WAIT <path_to_installer> /S /NoPostReboot /InstallVSCReader
   echo %ERRORLEVEL%
   ```

   where `<path_to_installer>` is the system filepath of the installer file.

   - **Windows PowerShell**: Open a PowerShell window and enter the following:

   ```
   $process = Start-Process -FilePath <path_to_installer> -ArgumentList "/
   S /NoPostReboot /InstallVSCReader _?<path_to_installer>" -Wait -
   PassThru; $process.ExitCode
   ```

where `<path_to_installer>` is the system filepath of the installer file. Note that this argument is used twice.

4. Configure the Standard Agent for Windows license information, as described here.
5. Install the ActivClient middleware (available from your SmartCard vendor) on the host machine. **Skip this step** if you are using Yubikey 5C or Yubikey 5 NFC.

Middleware installation notes

- ActivClient middleware must be installed in a console session.
- To prevent conflicts, only one middleware should be installed.

6. Reboot the remote machine.

Client Setup

1. Make sure that you downloaded Anyware Linux Client version 24.03 or later on the client machine.
2. Configure the client machine to connect to the agent machine. Follow the instructions in the topic "Connecting to an Agent Machine" in the Anyware Linux Client guide.
3. Plug the smart card reader into the Client machine, and use your smart card for authenticating the PCoIP session. For instructions on using the smart card to authenticate PCoIP sessions, consult "Using Smart Card Authentication to Connect to a Session" in the topic "Connecting to an Agent Machine" of the Anyware Linux Client guide.

Removing Smart Card Support

In order to remove support for Smart Card Authentication, uninstall the agent and then re-install it without using the `/InstallVSCReader` option.

USB

USB Support

Anyware agents support USB devices attached to Anyware clients. Administrators can set rules governing allowed and disallowed devices, device classes, or device protocols.

Important: USB support is enabled by default

USB bridging is enabled by default. If you want to restrict or disable USB support, you can globally disable or set rules governing USB behavior.

Isochronous USB device support

Some USB devices with time-sensitive information, such as webcams, are supported when connecting to the Standard Agent for Windows.

In addition, our technology partners provide additional solutions to expand peripheral support. For more information, look for partners listed under *Peripherals* on the Technology Partners page.

Bloomberg Keyboard Support

The Anyware Standard Agent for Windows supports **FRE100** and **STB100** keyboards when connected to a Anyware Zero Client via USB.

Xbox One Controller Support

The Anyware Standard Agent for Windows supports Xbox One controllers when attached to Anyware Zero Clients.

Supported by Anyware Zero Clients only

This feature is supported only by Anyware Zero Clients. It is not currently supported by Anyware Software Clients.

The following Xbox One controllers are supported:

- Xbox One 2015
- Xbox One
- Xbox One S
- Xbox One Bt
- Xbox One Elite

- Bug fixes and stability enhancements.

Tangent Panel Support

The following Tangent panels are supported when connecting from a Windows or Linux software client to a Windows or Linux agent (both 23.04 or higher).

- Tangent Ripple
- Tangent Wave
- Tangent Element BT
- Tangent Element MF
- Tangent Element KB
- Tangent Element TK
- Tangent Arc (Navigation)
- Tangent Arc (Grading)
- Tangent Arc (Function)

The Graphics Agent for macOS and the Software Client for macOS do not support Tangent panels.

Wacom Tablet Support

The Standard Agent for Windows supports Wacom tablets in two configurations: *bridged*, where peripheral data is sent to the desktop for processing, and *locally terminated*, where peripheral data is processed locally at the Anyware client.

Locally Terminated Wacom Tablets

Locally-terminated tablets have greatly improved responsiveness, and tolerate higher-latency (including 25ms and higher) networks.

For the best experience and most complete device support, use the latest available Anyware agent, Anyware software client, and Anyware Zero Client firmware. To find out when support was added for individual Wacom device, refer to the release notes for your client.

The following Wacom tablet models have been tested and are supported with local termination mode:

Anyware client support for *locally terminated* Wacom tablets and the Standard Agent for Windows

	Anyware Tera2 Zero Client	Anyware Software Client for Windows	Anyware Software Client for macOS	Anyware Software Client for Linux
Intuos Pro Small *PTH-460*	–	✔	✔	✔
Intuos Pro Medium *PTH-660*	✔[1]	✔	✔	✔
Intuos Pro Large *PTH-860*	✔[1]	✔	✔	✔
Cintiq Pro 16 *DTH-167*	–	✔	✔	✔
Cintiq Pro 16 *DTH-1621*	–	✔	✔	✔
Cintiq 22 *DTK-2260*	–	✔	✔	✔
Cintiq 22HD *DTK-2200*	✔[2]	✔	–	✔
Cintiq 22HDT - Pen & Touch *DTH-2200*	✔[2]	–	–	–
Cintiq Pro 24 *DTK-2420*	✔[2]	✔	–	✔
Cintiq Pro 24 - Pen & Touch *DTH-2420*	✔[2]	✔	✔	✔
Cintiq Pro 27 *DTH-271*	–	✔	✔	✔
Cintiq 32 Pro - Pen & Touch *DTH-3220*	✔[3]	✔	✔	✔

Important: Touch is not supported

Touch features of Wacom devices are not supported with local termination.

Other Wacom tablets may work, but have not been tested and should not be used in production environments.

Bridged Wacom Tablets

Bridged Wacom tablets are supported only in low-latency environments. Tablets in network environments with greater than 25ms latency will show reduced responsiveness and are not recommended.

The following Wacom tablet models have been tested and are supported with bridged mode:

Anyware client support for *bridged* Wacom tablets and the Standard Agent for Windows

	Anyware Tera2 Zero Client	Anyware Software Client for Windows	Anyware Software Client for macOS	Anyware Software Client for Linux
Intuos Pro Small *PTH-460*	✔	✔	✔	✔
Intuos Pro Medium *PTH-660*	✔	✔	✔	✔
Intuos Pro Large *PTH-860*	✔	✔	✔	✔
Cintiq Pro 16 *DTH-167*	—	✔	✔	✔
Cintiq Pro 16 *DTH-1621*	—	✔	✔	✔
Cintiq 22 *DTK-2260*	✔	✔	✔	✔
Cintiq 22HD *DTK-2200*	✔	✔	✔	✔
Cintiq 22HDT - Pen & Touch *DTH-2200*	✔	✔	✔	✔
Cintiq Pro 24 *DTK-2420*	✔	✔	✔	✔
Cintiq Pro 24 - Pen & Touch *DTH-2420*	✔	✔	✔	✔
Cintiq Pro 27 *DTH-271*	—	✔	✔	✔
Cintiq 32 Pro - Pen & Touch *DTH-3220*	✔	✔	✔	✔

Other Wacom tablets may work, but have not been tested.

⚠ Caution: Do Not Calibrate Pen Displays from Wacom Center

We recommend that you **NOT** calibrate your pen display from Wacom Center on the host machine. Doing so might result in the cursor getting offset when the tablet is used during a PCoIP session.

1. Local termination for Intuos Pro Small and Intuos Pro Medium requires Tera2 Zero Client firmware 6.2.0 or higher. ↩↩
2. Local termination for Cintiq 22HD, 22HDT, 24P, and 24PT requires Tera2 Zero Client firmware 6.5.0 or higher. ↩↩↩↩
3. Local termination for Cintiq Pro 32PT requires Tera2 Zero Client firmware 20.04 or higher. ↩

Webcam Support

USB webcams are supported between the Standard Agent for Windows and Anyware Software Clients for Windows or Linux. Webcams can be used with Microsoft Teams, Zoom, and other conferencing applications running on the remote desktop.

For detailed information about tested webcams, their performance metrics, and information on testing your own webcams, see HP Anyware Webcam Support in the our Knowledge Base.

As of Standard Agent for Windows 21.07, this feature is enabled by default.

Requirements

Webcam support in HP Anyware requires the following:

- Anyware Software Client for Windows or Anyware Software Client for Linux, 21.07+
- Anyware Standard Agent for Windows or Anyware Graphics Agent for Windows, 21.07+
- USB-attached webcam.

Notes and Limitations

- Webcams must be connected via USB. Webcams that are not USB, such as embedded laptop webcams, are not supported.
- Linux agents are not supported.
- Anyware Software Client for macOS is not supported.

Setup

On the client, connect the webcam as described in the following guides:

- Anyware Client for Windows: USB Bridging of Webcams
- Anyware Client for Linux: USB Bridging of Webcams

No setup is required on the remote host.

Installation Guide

Anyware Standard Agent for Windows Installation Guide

Before you proceed with installation, a few prerequisites must be met.

Prerequisites

These instructions assume you have already built the remote desktop machine, and that the machine meets the agent's requirements.

A few other things to confirm before proceeding:

- The desktop machine requires the following ports to be open: TCP 443, TCP 60443, TCP 4172, and UDP 4172.
- You should be able to run applications as an administrator.
- The Anyware Agent must be able to execute PowerShell scripts. If your PowerShell execution policy set to *Restricted*, the execution policy will be automatically changed so installation can proceed. *If the agent cannot execute PowerShell scripts or change the execution policy, the installation will fail*.
- If you are using a Local License Server, Local License Server, you'll need to know it's URL and port numbers.

Installation Overview

Once your prerequisites are in place, you can proceed with installation. Here's a brief overview of the process:

1. Connect to the machine using RDP.
2. Download or transfer the Anyware Standard Agent for Windows installer to the system.

3. Install the Anyware Agent using one of these methods:
    - Using the installer's setup wizard for a guided, interface-driven process, or
    - Silently using a script
4. If required, configure the agent software.
5. Disconnect the RDP session.
6. Connect to the desktop using a Anyware client.

If you're ready to start, connect to your machine with an RDP client and proceed to installation.

1. Download and Install the Agent

Download the Standard Agent for Windows Installer

The Anyware Agent installs at the system level and is available to all users. You must have administrator privileges to install it. You can download the installer directly onto the machine, or download it separately and transfer it yourself.

The installer can be downloaded here.

Install or Update the Standard Agent for Windows

Once the file is present on the remote machine, you can run the setup wizard or install it silently using a script. The procedure is the same for new installations and system upgrades.

Before you proceed, keep the following notes in mind:

- The installer may appear to hang while working. Allow at least one minute for it to finish.
- You may be disconnected from your RDP session while the installer is working. The installation does not stop, and you can reconnect immediately.
- ESXi users: when the Anyware agent is running, the desktop's graphics subsystem is unavailable to hypervisors. You can only view the system GUI when connecting with a Anyware client.

  For example, you cannot view an ESXi virtual machine console through vSphere. You must connect to the machine using PCoIP.

Installing the Anyware Agent using the Wizard

Important: Required ports will be automatically opened

The Standard Agent for Windows installer will add firewall exceptions for the following required PCoIP ports during installation: TCP 443, TCP 4172, UDP 4172, and TCP 60443.

If you're installing the Anyware agent via the Windows interface and would prefer to use a graphical interface and guided setup, use the Anyware agent setup wizard. This method can only be used via RDP, so if you're updating an existing installation, either run the wizard in an RDP session or perform a scripted installation instead.

To install the Anyware Agent using the setup wizard:

1. If you aren't already in an RDP session, connect to the desktop with an RDP client.
2. Navigate to the Anyware agent installer file and launch it. The setup wizard will appear.

> **Important: Installing without USB support**
>
> To install the Anyware Agent *without USB support*, run the installer from the command line and include the parameter `DisableUSB`. The installer will run but will skip all USB support components. When installed this way, the desktop will be unable to support USB devices other than standard keyboards and mice.

3. Select an installer language and click **OK**.
4. Click **Next** at the welcome screen.
5. Review and accept the license agreement by clicking **I agree**.
6. Specify an installation directory and click **Install**.

   By default, the software will be installed in the `C:\Program Files\Teradici\PCoIP Agent` directory.
7. Provide your licensing information on the License Registration screen.

> **Important: Local license server users**
>
> If you are using a local License Server, do not enter a registration code here. Select **Not now** and then click **Next** instead. You will configure your license server information later.

   Type or paste a registration code in the *Registration code* field and click **Next** for the proxy settings screen.

   - If you use a proxy server to access the internet, select **Use a proxy server for Internet connection** and specify the address and port numbers of the proxy server, then click **Next** to register the license.

- If your system does *not* use a proxy server, leave this screen unchanged and click **Next** to register the license.

8. The Windows desktop must be rebooted to complete installation; you can choose to do that now, or do it yourself later. Some features may not work until the system is restarted.
9. Click **Finish** to exit the installer.
10. If you skipped license registration, complete registration by following one of the procedures listed here.
11. Disconnect the RDP session.

Once the Anyware agent is installed and licensed, you can configure it or connect to it with a Anyware client.

Scripted Installations

The Anyware Agent can be installed on the desktop programmatically, without using a graphical interface. The installation will proceed silently and the system will reboot when finished.

Scripted installation requires access to the Windows Command Prompt or PowerShell.

Important: Required ports will be automatically opened

The Standard Agent for Windows installer will add firewall exceptions for the following required PCoIP ports during installation: TCP 443, TCP 4172, UDP 4172, and TCP 60443.

To install the Anyware Agent via a script:

1. Connect to the desktop using RDP or the hypervisor's console tool.
2. Copy the agent installer file to the desktop.
3. Run the agent installer using one of the following methods:

Overriding GPU prompts

If you need to bypass the installer's GPU prompt, add the `/Force` flag to the following commands. This is useful when using the Standard Agent for Windows in a deskside configuration with a physical PC, when the GPU prompt may not apply.

About /NoPostReboot

the `/NoPostReboot` flag, shown in the following commands, tell the installer not to reboot the machine. If omitted, the machine will be rebooted when the installer finishes.

- **Windows BAT**: Open a Windows command line tool and enter the following:

  ```
      start /WAIT <path_to_installer> /S /NoPostReboot
      echo %ERRORLEVEL%
  ```

  ...where `<path_to_installer>` is the system filepath of the installer file.

- **Windows PowerShell**: Open a PowerShell window and enter the following:

  ```
      $process = Start-Process -FilePath <path_to_installer> -ArgumentList
  "/S /NoPostReboot _?<path_to_installer>" -Wait -PassThru;
  $process.ExitCode
  ```

  ...where `<path_to_installer>` is the system filepath of the installer file. Note that this argument is used twice!

Both methods will return one of these process return codes:

code	description
0	success
1	installation aborted by user (user cancel)
2	installation aborted due to error
1641	success, reboot required

4. If you are using Cloud Licensing, register the Anyware agent's license by running the `pcoip-register-host.ps1` script:

```
    "C:\Program Files\Teradici\PCoIP Agent\pcoip-register-host.ps1"
[ɆProxyServer <String>] [ɆProxyPort <String>] ɆRegistrationCode <String>
[<CommonParameters>]
```

Where:

- `-RegistrationCode` sets the registration code to use.
- `-ProxyServer` sets the address of your proxy server, if you have one.

- `-ProxyPort` sets the port number of your proxy server, if you have one.

> **Important: PowerShell execution policy**
>
> PowerShell scripts must be permitted to run on your machine. If your execution policy prevents pcoip-register-host.ps1 from running, you can temporarily enable PowerShell script execution with the following command:
>
> ```
>     powershell.exe ɆInputFormat None ɆExecutionPolicy Bypass ɆCommand .
> \pcoip-register-host.ps1
> ```

Once the Anyware agent is installed and licensed, you can configure it or connect to it with a Anyware client.

Register a License After Installation

In most cases, a PCoIP license is registered during installation. If you are using a local license server, or if you skipped registration during installation, you can register your agent using the methods described next.

- **Registering with Cloud Licensing**: If you are using HP's Cloud Licensing service (most systems use this method), you can register the agent using the PCoIP control panel or via a PowerShell script.
- **Registering with a Local License Server**: If you are serving licenses with your own license server, your registration method depends on your brokering environment. For complete information and instructions, see Licensing Anyware Agents with a Local License Server.

Licensing The Standard Agent for Windows

The Standard Agent for Windows must be assigned a valid PCoIP session license before it will work. Until you've registered it, you can't connect to the desktop using a Anyware client.

You receive a registration code when you purchase a pool of licenses from HP. Each registration code can be used multiple times; each use consumes one license in its pool.

Note: Registration code format

Registration codes look like this: `ABCDEFGH12@AB12-C345-D67E-89FG`

PCoIP agent license registrations are managed automatically by HP Anyware's Cloud Licensing Service. If necessary, you can manage them yourself, using your own locally-installed PCoIP License Server instead.

If you need to purchase licenses, contact HP.

Troubleshooting Licensing Issues

If you're encountering problems with HP licensing, refer to Troubleshooting License Issues.

Using HP Anyware Cloud Licensing

To use Cloud Licensing, all you need to do is provide a registration code for each PCoIP agent in your deployment (the same registration code can be used multiple times).

Important: Allowlist network blocks for Anyware Cloud Licensing

If you are using Anyware Cloud Licensing, you will need to add the following to your allowlist:

- `teradici.flexnetoperations.com`
- `teradici.compliance.flexnetoperations.com`

If you use an IP-based allowlist, we recommend your IT team add the following network blocks to your allowlist:

- `IPv4: 185.146.155.64/27`
- `IPv6: 2620:122:f005::/56`

Important: Migrating from the previous specification

Previously, our allowlist specification looked like this:

- **Production**: `64.14.29.0/24`
- **Disaster Recovery**: `64.27.162.0/24`

If you have an existing implementation using an IP-based allowlist like this, we recommend you leave it in place until the new allowlist is active and tested.

The Windows setup wizard collects this registration code during installation. If you're already registered your Anyware agents, there's nothing more to do here. If you've already installed the Anyware agent software but *have not* registered it yet, you can register post-installation using the PCoIP Control panel or via a PowerShell Script.

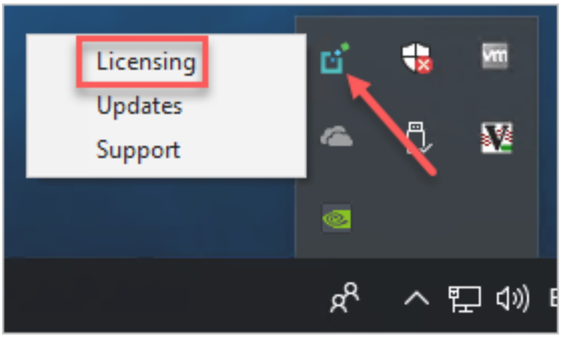
Register or Renew a PCoIP License With the PCoIP Control Panel

Use this method to register or renew an installed Anyware agent using the Windows user interface.

To provide the registration code via the PCoIP Control Panel:

1. Connect to the desktop using RDP (if you're renewing a license that is still active, you can use a PCoIP session to do this instead).

2. Open the *PCoIP control panel* by clicking in the system tray and select **Licensing** from the pop-up menu:



The PCoIP Control panel appears with the licensing tab enabled.

3. Provide the registration code in the registration code field.

Register or Renew a PCoIP License With PowerShell

Use this method to register a Anyware agent using Windows PowerShell. You can do this during a scripted installation, or at any time after installation.

To provide the registration code via the Windows PowerShell script:

1. Connect to your dekstop using RDP.
2. Run the `pcoip-register-host.ps1` script:

```
    "C:\Program Files\Teradici\PCoIP Agent\pcoip-register-host.ps1"
[ɆProxyServer <String>] [ɆProxyPort <String>] ɆRegistrationCode <String>
[<CommonParameters>]
```

Where:

- `-RegistrationCode` sets the registration code to use.
- `-ProxyServer` sets the address of your proxy server, if you have one.
- `-ProxyPort` sets the port number of your proxy server, if you have one.

Important: PowerShell execution policy

PowerShell scripts must be permitted to run on your machine. If your execution policy prevents pcoip-register-host.ps1 from running, you can temporarily enable PowerShell script execution with the following command:

```
    powershell.exe ɆInputFormat None ɆExecutionPolicy Bypass ɆCommand .
\pcoip-register-host.ps1
```

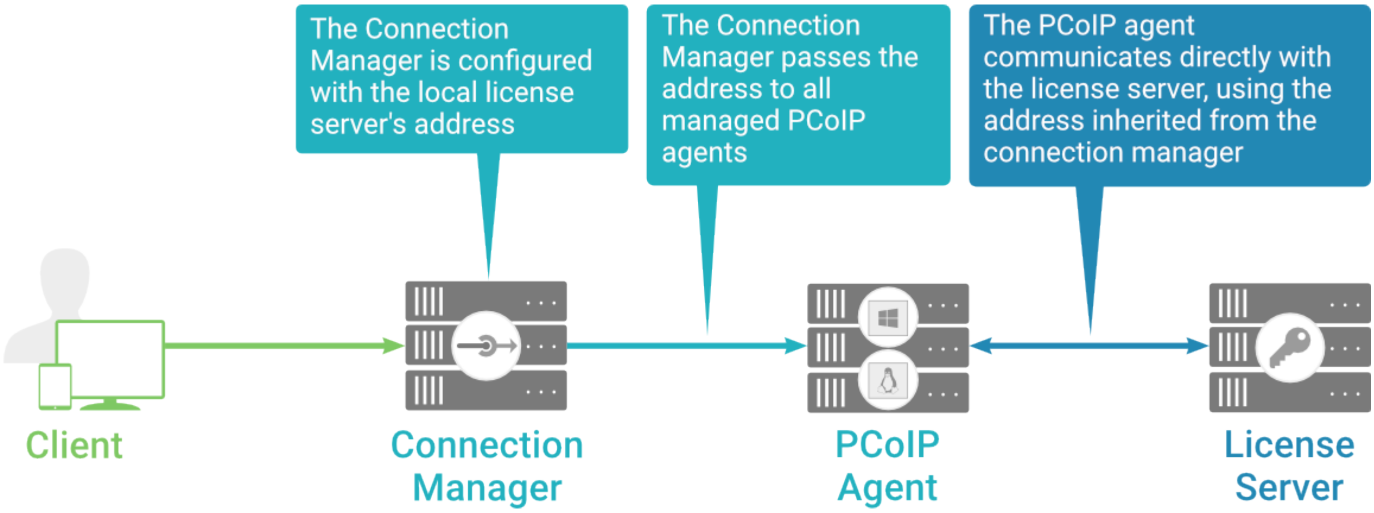
Licensing PCoIP Agents With a Local License Server

In deployments where PCoIP agents cannot access the internet, or where cloud-based licensing is not permitted or desired, a local PCoIP License Server can be used instead. The PCoIP License Server manages PCoIP session licenses within your private environment.

Configuring PCoIP agents to use a local license server is done in one of two ways, depending on whether your deployment uses a PCoIP Connection Manager, or whether your PCoIP clients connect directly to PCoIP agents.

Brokered Environment Licensing

In *brokered* deployments, the license server address is configured in the Connection Manager, which passes it through to its managed PCoIP agents.


The Connection Manager is configured with the local license server's address
The Connection Manager passes the address to all managed PCoIP agents
The PCoIP agent communicates directly with the license server, using the address inherited from the connection manager
Client
Connection Manager
PCoIP Agent
License Server

When using a Connection Manager, the license server address is only configured once no matter how many PCoIP agents are behind the Connection Manager.

To set the License Server URL in the Connection Manager:

1. On the Connection Manager machine, use a text editor to open /etc/ConnectionManager.conf.
2. Set the `LicenseServerAddress` parameter with the address of your local license server:
    - `http://{license-server-address}:{port}/request`
3. Save and close the configuration file.
4. Restart the Connection Manager.

VERIFYING YOUR BROKERED LICENSING CONFIGURATION

To verify your system's licensing configuration, run the `pcoip-validate-license.ps1` PowerShell script on the Anyware Agent machine. The script will ping the license server and attempt to retrieve information on an available license:

```
C:\ProgramFiles\Teradici\PCoIPAgent\pcoip-validate-license.ps1
ɆLicenseServerUrl <license-server-address> [ɆThroughProxyServer <proxy-server-
address>] [ɆProxyPort <proxy port>]
```

Where `<license-server-address>` is the address of the license server to ping, formatted as `http://{license-server-address}:{port}/request`

If the license server is behind a proxy server, provide the proxy information via the `ɆThroughProxyServer` and `ɆProxyPort` parameters.

If successful, the response will show that a valid license was found on the license server, and its expiration date.

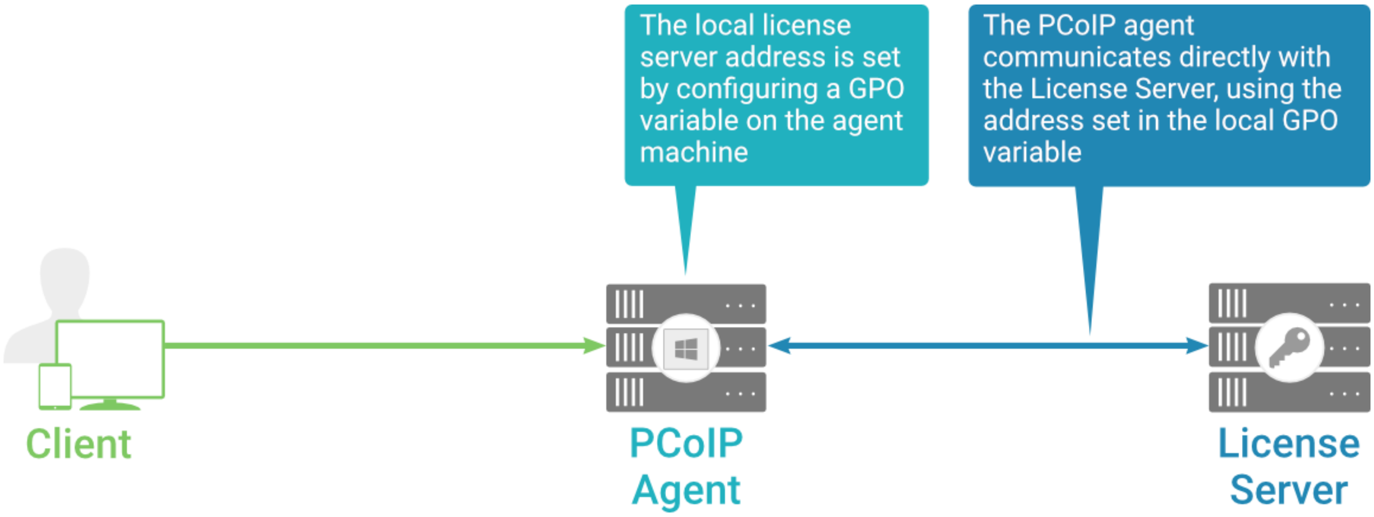
If the connection is unsuccessful, investigate the following possibilities:

- The license server address is incorrect, or formatted incorrectly.
- The license server is inaccessible.
- There are no available licenses on the license server. `pcoip-validate-license.ps1` will only return a positive response if there is at least one available session license.

- If you have only one license on the license server and run `pcoip-validate-license.ps1` from a PCoIP session, the command will fail because you are currently using the single license. In this scenario, disconnect your PCoIP session and try again from an RDP session instead.

Unbrokered Environment Licensing

In direct, or unbrokered, deployments, each PCoIP agent is configured with the license server address via a GPO variable. When a client initiates a new PCoIP session, the PCoIP agent uses its local configuration to communicate with the license server.


The local license server address is set by configuring a GPO variable on the agent machine
The PCoIP agent communicates directly with the License Server, using the address set in the local GPO variable
Client
PCoIP Agent
License Server

Local license validation using a PCoIP Windows agent and a direct (unbrokered) connection

Each PCoIP agent in your environment must be individually configured with the license server's URL.

To configure the License Server URL on the Anyware Agent machine:

1. Open the Local Group Policy Editor on the agent machine:
    1. Press ⊞ + `r` to open the run dialog
    2. type `gpedit.msc` and press `Enter`.
2. Navigate to *Computer Configuration > Administrative Templates > PCoIP Session Variables > Overridable Administrative Defaults*.

    The list of configurable PCoIP settings will appear in the right panel.
3. Open the **Configure the license server URL** variable.
4. Select the **Enabled** option.
5. Enter the License Server URL in the option field and click **OK**. The URL format is `http://{license-server-address}:{port}/request`.

VERIFYING YOUR UNBROKERED LICENSING CONFIGURATION

To verify your system's licensing configuration, run the `pcoip-validate-license.ps1` PowerShell script. The script will ping the license server using the local GPO configuration and attempt to retrieve information on an available license:

```
C:\ProgramFiles\Teradici\PCoIPAgent\pcoip-validate-license.ps1
```

If successful, the response will show that a valid license was found on the license server, and its expiration date.

If the connection is unsuccessful, investigate the following possibilities:

- The license server address is incorrect, or formatted incorrectly.
- The license server is inaccessible.
- There are no available licenses on the license server. `pcoip-validate-license.ps1` will only return a positive response if there is at least one available session license.
- If you have only one license on the license server and run `pcoip-validate-license.ps1` from a PCoIP session, the command will fail because you are currently using the single license. In this scenario, disconnect your PCoIP session and try again from an RDP session instead.

Updating the Agent

To update the Graphics Agent to a new version, obtain the new installer and run it in place to replace the older version. Your configuration settings will be preserved.

Before you begin, make sure that you have read the Installation Overview topic.

1. Download and copy the new installer file onto the host machine.
2. Do one of the following:
    - Upgrade the agent using the wizard, or
    - Upgrade silently via command line.

Uninstalling the Standard Agent for Windows

You can uninstall the Standard Agent for Windows using the Windows Control Panel, or by using the uninstall utility in the agent's installation directory.

> **Reboot is required**
>
> The Windows desktop must be rebooted to complete uninstallation; you can choose to do that now, or do it yourself later. Some features may not work until the system is restarted.

Uninstalling via the Windows Control Panel

To uninstall the Anyware Standard Agent for Windows using the Windows Control Panel:

1. Disconnect any active PCoIP sessions on the host machine.
2. Log in as an administrator to the desktop via RDP.
3. In *Control Panel* > *Programs*, select **Uninstall a program**.
4. Select the Agent from the list and click Uninstall.

Uninstalling via the Uninstall Utility

To uninstall the Anyware Standard Agent for Windows from Windows:

1. Disconnect any active PCoIP sessions on the host machine.
2. Log in as an administrator to the remote host via RDP *or* via the hypervisor console.
3. Open a Windows Explorer window and navigate to the directory where the Standard Agent for Windows is installed (by default, `C:\Program Files\Teradici\Anyware Agent`).
4. Double-click **uninst** and follow the prompts.

Configuration Guide

You can configure the Anyware agent, and optimize PCoIP protocol behavior for local network conditions, by adjusting Windows GPO variables.

The variables are in **admx** template files, which are imported automatically by the agent installer.

> **Template files on domain controllers are not automatically installed**
>
> Template files are not automatically installed on domain controllers. You must manually import the files into the domain controller's Group Policy Editor.

> **Note: Support for IPv6 Addresses**
>
> The Standard Agent for Windows supports IPv6 addresses. No configuration is needed to switch between IPv4 and IPv6 modes.

Modifying PCoIP GPO Variables

All of the PCoIP settings can be configured using this procedure. The configurable settings are described in the following section.

To modify a PCoIP session variable:

1. Open the Local Group Policy Editor on the agent machine:
   a. Press ⊞ + `r` to open the run dialog
   b. type `gpedit.msc` and press `Enter`.
2. In the left pane, navigate to *Administrative Templates* and then to *PCoIP Session Variables*.

   The variables you can configure appear in the right pane.
3. Double-click the GPO you want to configure to open the variable's configuration window, then:

   a. Select *Enabled* to enable the PCoIP setting.

   b. Configure any parameters that are available for the setting.

   c. Click **OK** to close the GPO's configuration window.

4. Repeat step 3 until all policies have been set.
5. Close the Local Group Policy Editor.

> **Note: Changes require a new PCoIP connection**
>
> Changes take effect on the next PCoIP connection to the desktop.

H.264 Hardware Decode Requirements

For H.264 Hardware Decode, the **Graphics Agent** must have an NVIDIA Graphics Card that supports PCoIP Ultra GPU Offload, and PCoIP Ultra setting is either set to GPU Offload or Auto Offload.

> **Note: Default Values**
>
> In deployments with no existing PCoIP Ultra configuration, PCoIP Ultra defaults to "Auto Offload" and YUV Chroma subsampling defaults to 4:2:0.

The following NVIDIA graphics cards are supported:

- NVIDIA Quadro P400
- NVIDIA GeForce RTX 3060

Any Nvidia GPU with NVENC support are expected to work, but have not been tested.

Configurable Settings

The following settings can be configured on the Standard Agent for Windows. Refer to Configuring the Anyware agent to understand how to modify these settings.

Authentication broker URL

Directive	Options	Default
`Authentication broker url`	string *(up to **511** characters)*	—

This setting takes effect when you start the next session. This policy sets the authentication broker URL for federated user authentication. Enter the authentication broker URL in 'https://address:port/auth' format. This setting overwrites the Authentication broker URL from Connection Manager.

Build-to-lossless

Directive	Options	Default
`Enable build to lossless`	Checked (on), Unchecked (off)	Off

This setting takes effect immediately. Specifies whether to turn the build-to-lossless feature of the PCoIP protocol off or on; this feature is turned off by default.

If this setting is Disabled or Not Configured then the build-to-lossless feature is turned off and images and other desktop content may never build to a lossless state. In network environments with constrained bandwidth, turning off the build-to-lossless feature can provide bandwidth savings. If this setting is Enabled then the build-to-lossless feature is turned on; this is recommended for environments that require images and desktop content to be built to a lossless state.

Clipboard redirection

Directive	Options	Default
`Server clipboard state`	Disabled in both directions Enabled in both directions Enabled client to agent only Enabled agent to client only	—

This setting takes effect when you start the next session. Determines the direction in which clipboard redirection is allowed. You can select one of these values:

- Disabled in both directions
- Enabled in both directions (default setting)

- Enabled client to agent only (That is, allow copy and paste only from the client system to the host desktop.)
- Enabled agent to client only (That is, allow copy and paste only from the host desktop to the client system.)

Clipboard redirection is implemented as a virtual channel. If virtual channels are disabled, clipboard redirection does not function.

When this setting is disabled or not configured, the default value is Enabled in both directions.

Collaboration

Directive	Options	Range	Increment	Default
`Enable collaboration`	Checked (on), Unchecked (off)			Off
`Max collaborators`		1 – 5	1	5
`Collaboration udpport`		1 – 65535	1	64172

This setting takes effect when the agent is restarted. This policy enables or disables user collaboration. When not configured, user collaboration is disabled by default.

The default maximum number of collaborators allowed is 5.

The default UDP starting port used for collaborator sessions is 64172. When a different starting port is used, ensure that firewall rules are adjusted so that PCoIP traffic can go through the new port.

If there is more than one collaborator, additional UDP ports will be needed for the collaborator sessions. For example, when the second collaborator connects, the next free UDP port will be opened on the host.

Collaboration input control

Directive	Options	Range	Increment	Default
`Enable collaboration input control`	Checked (on), Unchecked (off)			Off
`Collaboration input control timeout`		100 – 10000	100	3000

This setting takes effect when you start the next PCoIP session. This policy enables or disables input control from the collaborators. When not configured, collaboration input control is disabled by default.

The input control timeout specifies the waiting period before any user with input control permission can acquire the input control of the host. The current input owner is the only one authorized to send mouse, keyboard and touch inputs to the host.

Connection addresses

Directive	Options	Default
`Connection address`	string *(up to **511** characters)*	—
`Client connection address`	string *(up to **511** characters)*	—

This setting takes effect when you start the next session. Configuring this allows you to control the IPv4 or IPv6 address used by the agent or client in PCoIP sessions.

'Connection Address' controls the IP address used by the agent for the PCoIP session.

'Client Connection Address' controls the IP address the client is told to use when establishing the PCoIP session.

Please note that neither of these values should need to be set under normal circumstances.

Deskside mode

Directive	Options	Default
`Enable deskside`	Checked (on), Unchecked (off)	Off
`Enable deskside screen blanking`	Checked (on), Unchecked (off)	On
`Enable deskside input blocking`	Checked (on), Unchecked (off)	On
`Enable deskside local display restoration`	Checked (on), Unchecked (off)	On

This setting takes effect when you start the next session. Deskside mode is only supported on Graphics Agent for Windows. When this setting is disabled or not configured Deskside mode will not be used. It should only be configured for Workstation PCoIP Graphics agents that have displays and input devices physically connected.

Enabling Deskside mode allows the following additional features to be configured:

- Screen blanking When enabled, where possible, any displays plugged into the agent machine will be blanked during the session, and unblanked at the end of session.
- Input blocking When enabled mouse and keyboard access from devices physically connected to the agent machine will be blocked. Input from physically connected devices will be restored at end of session. Note that input blocking may interfere with Wacom tablet functionality, disabling it is recommended when using a Wacom tablet.
- Local display restoration at end of session When enabled displays will be restored to their pre-session state when the session ends. Local display restoration is only supported on Graphics Agent for Windows with an NVIDIA GPU.

Enable Disclaimer Authentication

Directive	Options	Default
`Enable disclaimer auth`	Checked (on), Unchecked (off)	Off

This setting takes effect when you start the next session. When this setting is enabled, users connecting via direct connect will be presented a disclaimer prior to user authentication. If the disclaimer is rejected, the user will not be able to connect.

Disclaimer files must be placed in %PROGRAMDATA%\Teradici\PCoIPAgent\disclaimers. Files must be named according to the locale, e.g. en_US.txt for en_US, ko_KR.txt for ko_KR, etc. If a file matching the negotiated locale is not present, en_US will be used as a fallback. If disclaimer text cannot be found, an blank disclaimer will be presented.

Enable the PCoIP control panel

Directive	Options	Default
`Control panel`	Checked (on), Unchecked (off)	—

This setting takes effect when the agent is restarted. This policy enables or disables the PCoIP control panel. When enabled, the PCoIP control panel will be running, and when disabled the control panel will not be running. When not configured, will run by default.

Enable/disable USB in the PCoIP session

Directive	Options	Default
`Enable usb`	Checked (on), Unchecked (off)	On

This setting takes effect when you start the next session. Determines whether USB support is enabled in PCoIP sessions. When this setting is not configured, USB is enabled by default. By default all devices are supported unless restrictions are configured through the USB device rules setting.

Enable/disable audio in the PCoIP session

Directive	Options	Default
`Enable audio`	Checked (on), Unchecked (off)	On

This setting takes effect when you start the next session. Determines whether audio is enabled in PCoIP sessions. Both endpoints must have audio enabled. When this setting is enabled, PCoIP audio is allowed. When it is disabled, PCoIP audio is disabled. When this setting is not configured, audio is enabled by default.

Enable/disable relative mouse support

Directive	Options	Default
`Enable relative mouse`	Checked (on), Unchecked (off)	On

This setting takes effect when you start the next session. It determines whether relative mouse co-ordinates may be used, when appropriate, during the PCoIP session. By default, this setting is enabled.

Enable/disable trusted domain checks

Directive	Options	Default
`Enable trusted domain check`	Checked (on), Unchecked (off)	Off

This setting takes effect when you start the next session. Its purpose is to allow additional security checking of the domain provided during user authentication. By default, this setting is disabled, meaning provided domains are not verified to be trusted. When enabled, the domain used during user authentication is verified to be trusted.

Hide local cursor

Directive	Options	Default
`Disable locally rendered cursor`	Checked (on), Unchecked (off)	Off

This setting takes effect immediately. When this setting is enabled the local cursor on the client will be hidden. This may resolve duplicate cursor issues if there is a host rendered cursor within the host environment but may also result in no visible cursor. With this setting enabled there may be delays in mouse movements due to network latency and video processing times. By default, this setting is disabled, meaning that local cursors will be used, providing the most responsive user experience.

License server URL

Directive	Options	Default
`License server path`	string *(up to **511** characters)*	—

This setting takes effect when you start the next session. This policy sets the license server path. Enter the license server path in 'https://address:port/request' or 'http://address:port/request' format.

Maximum PCoIP session bandwidth

Directive	Range	Increment	Default
`Max link rate`	104 – 900000	100	900000

This setting takes effect when you start the next session. Specifies the maximum bandwidth, in kilobits per second, in a PCoIP session. The bandwidth includes all imaging, audio, virtual channel, USB, and control PCoIP traffic.

Set this value based on the overall capacity of the link to which your endpoint is connected, taking into consideration the number of expected concurrent PCoIP sessions. For example, with a single user VDI configuration (e.g. a single PCoIP session) that connects through a 4Mbit/s Internet connection, set this value to 4Mbit (or 10% less than this value to leave some allowance for other network traffic).

Setting this value prevents the agent from attempting to transmit at a higher rate than the link capacity, which would cause excessive packet loss and a poorer user experience. This value is symmetric. It forces the client and agent to use the lower of the two values that are set on the client and agent side. For example, setting a 4Mbit/s maximum bandwidth forces the agent to transmit at a lower rate, even though the setting is configured on the client.

When this setting is disabled or not configured on an endpoint, the endpoint imposes no bandwidth constraints. When this setting is configured, the setting is used as the endpoint's maximum bandwidth constraint in kilobits per second.

The default value when this setting is not configured is 900000 kilobits per second.

This setting applies to the agent and client. If the two endpoints have different settings, the lower value is used.

PCoIP Security Certificate Settings

Directive	Options	Default
`SSL cert type`	From certificate storage Generate a unique self-signed certificate From certificate storage if possible, otherwise generate	—
`Cert store name`	string *(up to **255** characters)*	MY
`SSL cert min key length`	1024 bits 2048 bits 3072 bits 4096 bits	—

This setting takes effect when you start the next session. This policy dictates the handling of certificates.

A certificate is used to secure PCoIP related communications. The way PCoIP components choose a certificate is based on the certificate type, the name of the Certificate Store (referred to as "certificate storage") and the key length. Without a certificate being generated or selected, a PCoIP Session cannot be established.

Depending on the value chosen for the option, 'How the PCoIP agent chooses the certificate...' and the availability of appropriate certificates, PCoIP components may acquire a CA signed certificate from the Windows Certificate Store or generate an in-memory self-signed certificate.

Name the Windows Certificate Store where the CA signed certificate is stored. The default is the "MY" store (shown as "Personal" in Management Console). Set the friendly name of the CA signed certificate to be PCoIP, in the Windows Certificate Store.

CA certificate(s) must be stored in the "Trusted Root Certification Authorities" store (sometimes referred to as "ROOT").

Select a minimum key length (in bits) for choosing a CA signed certificate from the Windows Certificate Store. Longer length certificates will require more computing resources and may reduce performance, but will increase security. Shorter length certificates will provide better performance at the cost of lower security.

Note: Please refer to Teradici documentation for instructions on creating and deploying certificates.

PCoIP Security Settings

Directive	Options	Default
`TLS cipher blacklist`	string *(up to **1023** characters)*	—

This setting controls the cryptographic cipher suites used by PCoIP endpoints. Changes will take effect when the agent is restarted. When this setting is disabled or not configured, all supported cipher suites may be used for connections. The endpoints negotiate the actual cryptographic cipher suites based on the settings configured here. Newer versions of TLS and stronger cipher suites will be preferred during negotiation between endpoints. Supported cipher suites:

- TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384
- TLS_DHE_RSA_WITH_AES_256_GCM_SHA384
- TLS_AES_256_GCM_SHA384

Blacklisted Cipher Suites Provides the ability to block specific cipher suites from being offered during negotiation. Must be entered as a semi-colon separated list of cipher suites.

PCoIP USB allowed and unallowed device rules

Directive	Options	Default
`Usb auth table`	**23XXXXXX** **2203XXXX**	23XXXXXX
`Usb unauth table`	**2203XXXX**	—

This setting specifies the USB devices that are authorized and unauthorized for use in a PCoIP session. Any changes to this setting only takes effect after you start the next session.

If this setting is left Not Configured or set to Disabled, then the default behavior is all devices are allowed.

When this setting is enabled, only devices listed in the USB authorization table are permitted in PCoIP sessions, provided they are not subsequently excluded by an entry in the USB unauthorization table.

If this setting is enabled with an empty USB authorization string, this means that no USB devices are allowed. An empty USB unauthorization string means that only USB devices in the authorization list are allowed.

You can define a maximum of 50 USB authorization rules and a maximum of 50 USB unauthorization rules. Separate multiple rules with the vertical bar (|) character. Please note the final number of authorization/unauthorization rules in a PCoIP session are negotiated by PCoIP client and agent. Some clients have a limit of 10 USB rules. Please refer to the PCoIP agent admin guide for details.

Each rule can be a combination of a Vendor ID (VID) and a Product ID (PID), or a rule can describe a class of USB devices. A class rule can allow or disallow an entire device class, a single subclass or a protocol within a subclass.

The format of a combination VID/PID rule is 1xxxxyyyy, where xxxx is the VID in hexadecimal format and yyyy is the PID in hexadecimal format. For example, the rule to allow or block a device with VID=0x1a2b and PID=0x3c4d is 11a2b3c4d.

For class rules, use one of the following formats:

Allow All USB Format: 23XXXXXX Allow All Devices Example: 23XXXXXX

Allow USB Format: 22classXXXX Class Example: 22aaXXXX

Allow a Specific Format: 21class-subclassXX Subclass Example: 21aabbXX

Allow a Specific Format: 20class-subclass-protocol Protocol Example: 20aabbcc

For example, the USB authorization string to allow USB HID (mouse and keyboard) devices (class ID 0x03) and mass storage devices (class ID 0x08) is 2203XXXX|2208XXXX. The USB unauthorization string to disallow USB Mass Storage devices (class ID 0x08) is 2208XXXX.

PCoIP Ultra

Directive	Options	Range	Increment	Default
`Enable ultra`	Checked (on), Unchecked (off)			On
`Ultra`	Disabled CPU Offload GPU Offload Automatic Offload			—
`Ultra offload mpps`		1 – 40	1	10

This setting takes effect when you start the next session. When this setting is disabled, PCoIP Ultra will not be used.

- PCoIP Ultra CPU Offload - these optimizations require CPU support for the AVX2 instruction set on both the remote host and client and are not compatible with the PCoIP Zero client. CPU Offload is recommended for 4K UHD resolutions with video playback requirements of 30 fps (or more) and highest image quality / color accuracy.
- PCoIP Ultra GPU Offload - these optimizations require an NVIDIA graphics card on the remote host capable of NVENC. GPU Offload is recommended when minimal CPU impact of pixel encoding is desired.
- PCoIP Ultra Auto Offload - enabling this setting allows PCoIP to automatically switch between CPU and GPU Offload modes; CPU Offload is used by default to provide the best image fidelity, GPU Offload is used during periods of high display activity to provide improved frame rates and bandwidth optimization. This setting is only effective if the remote host and client endpoints are capable of both CPU and GPU Offload.

The PCoIP Ultra Offload MPPS sets the Megapixels Per Second (MPPS) transition rate between PCoIP Ultra CPU Offload and PCoIP Ultra GPU Offload. Under Auto-Offload, PCoIP Ultra uses CPU Offload at lower pixel rates and switches to GPU Offload at the Offload MPPS. Increasing this value results in PCoIP Ultra transitioning to GPU Offload at a higher pixel rate and decreasing this value results in the transition at a lower pixel rate. The default PCoIP Ultra Offload MPPS is set to 10.

PCoIP event log verbosity

Directive	Range	Increment	Default
`Event filter mode`	0 – 3	1	2

This setting takes effect immediately. This policy enables the configuration of the PCoIP event log verbosity ranging from 0 (least verbose) to 3 (most verbose).

When this policy is Disabled or Not Configured, the default event log verbosity setting is 2. When this policy is Configured, the setting controls the verbosity level as described above.

PCoIP image quality levels

Directive	Options	Range	Increment	Default
`Minimum image quality`		30 – 100	10	40
`Maximum initial image quality`		30 – 100	10	80
`Frame rate vs quality factor`		0 – 100	10	50
`Maximum frame rate`		0 – 60	1	—
`Yuv chroma subsampling`	4:4:4 4:2:0			—
`Use client img settings`	Checked (on), Unchecked (off)			Off

This setting takes effect immediately. Controls how PCoIP renders images during periods of network congestion. The Minimum Image Quality, Maximum Initial Image Quality, and Maximum Frame Rate values interoperate to provide fine control in network-bandwidth constrained environments.

Use the Minimum Image Quality value to balance image quality and frame rate for limited-bandwidth scenarios. You can specify a value between 30 and 100. The default value is 40. A lower value allows higher frame-rates, but with a potentially lower quality display. A higher value provides higher image quality, but with potentially lower frame rates when network bandwidth is constrained. When network bandwidth is not constrained, PCoIP maintains maximum quality regardless of this value.

Use the Maximum Initial Image Quality value to reduce the network bandwidth peaks required by PCoIP by limiting the initial quality of the changed regions of the display image. You can specify a value between 30 and 100. The default value is 80. A lower value reduces the image quality of content changes and decreases peak bandwidth requirements. A higher value increases the image quality of content changes and increases peak bandwidth requirements. Unchanged regions of the image progressively build to a lossless (perfect) quality regardless of this value. A value of 80 or lower best utilizes the available bandwidth.

The Minimum Image Quality value cannot exceed the Maximum Initial Image Quality value.

Use the Frame Rate vs Image Quality value to favor image sharpness over smooth motion during a PCoIP session when network bandwidth is limited. Lower values favor smoothness, higher values favor sharpness of image.

Use the Maximum Frame Rate value to manage the average bandwidth consumed per user by limiting the number of screen updates per second. You can specify a value between 1 and 60 frames per second. A higher value can use more bandwidth but provides less jitter, which allows smoother transitions in changing images such as video. A lower value uses less bandwidth but results in more jitter.

YUV chroma subsampling is set to 4:2:0 by default. It enables chroma subsampling to further compress the imaging to reduce bandwidth usage at the cost of reduced color accuracy. 4:2:0 subsampling is only supported in combination with PCoIP Ultra GPU optimization. Please note: 4:4:4 subsampling with PCoIP Ultra GPU optimization is GPU dependent and is not supported by all GPUs, in this case, PCoIP will fall back to 4:2:0 subsampling. Please see our support site for further details.

Set the 'Use image settings from zero client' when you want to use the 'Minimum Image Quality', 'Maximum Initial Image Quality', 'Maximum Frame Rate', 'Disable Build to Lossless' values from the client instead of the host. Currently, only Zero Client Firmware 3.5 and above support these settings on the client side.

These image quality values apply to the soft host only and have no effect on a soft client.

When this setting is disabled or not configured, the default values are used.

PCoIP log retention

Directive	Range	Increment	Default
`Max log retention days`	7 – 100	1	30

This setting takes effect immediately. This policy sets the retention period (in days) for PCoIP logs that have been archived. PCoIP log files are periodically archived to %PROGRAMDATA% \Teradici\logs\ROTATE. When this policy is Disabled or Not Configured, archived logs that have not been modified in 30 days are removed. When this policy is Configured, the setting controls the retention period as described above.

When configuring a retention period PowerShell 4.0 or newer is required. If an older PowerShell version is installed then the default retention period will be used, regardless of the configured setting.

PCoIP session MTU

Directive	Range	Increment	Default
`MTU size`	500 – 1500	1	1200

This setting takes effect when you start the next session. Specifies the Maximum Transmission Unit (MTU) size for UDP packets for a PCoIP session.

The MTU size includes IP and UDP packet headers. TCP uses the standard MTU discovery mechanism to set MTU and is not affected by this setting. The maximum MTU size is 1500 bytes. The minimum MTU size is 500 bytes. The default value is 1200 bytes.

Typically, you do not have to change the MTU size. Change this value if you have an unusual network setup that causes PCoIP packet fragmentation.

This setting applies to the agent and client. If the two endpoints have different MTU size settings, the lowest size is used.

If this setting is disabled or not configured, the client uses the default value in the negotiation with the agent.

PCoIP session SSO access control

Directive	Options	Default
`Single sign on`	Checked (on), Unchecked (off)	—

This setting takes effect when you start the next session. Enable/Disable the single sign on access control to a PCoIP session.

When this policy is Not Configured, the single sign on access control is enabled.

PCoIP session audio bandwidth limit

Directive	Range	Increment	Default
`Audio bandwidth limit`	0 – 100000	1	512

This setting takes effect immediately. Specifies the maximum audio bandwidth that can be used for audio output (sound playback) from the virtual desktop to the client in a PCoIP session. Note that the network transport overhead can add an additional 20-40% bandwidth to this number.

This setting does not apply to audio input (recording) from the client to the virtual desktop. This setting also has no effect on USB audio devices which are connected to the virtual desktop through USB redirection.

Audio processing monitors the bandwidth needed for audio and selects the audio compression algorithm that provides the best quality possible, without exceeding the bandwidth limit:

- 512 kbit/s or higher - 7.1 surround, high-quality, compressed audio
- 384 kbit/s or higher - 5.1 surround, high-quality, compressed audio
- 256 kbit/s or higher - stereo, high-quality, compressed audio
- 48 kbit/s to 255 kbit/s - stereo audio ranging between FM radio quality down to AM radio quality
- 32 kbit/s to 47 kbit/s - monaural AM radio or phone call quality
- Below 32 kbit/s - results in no audio playback

If this setting is disabled or not configured, a default audio bandwidth limit of 512 kbit/s is configured to constrain the audio compression algorithm selected. If the setting is configured, the value is measured in kilobits per second (kbit/s), with a default audio bandwidth limit of 512 kbit/s.

Note that zero clients on older firmware have less efficient audio compression algorithms that may require setting this limit higher to achieve the same audio quality or upgrading the firmware.

PCoIP session bandwidth floor

Directive	Range	Increment	Default
`Device bandwidth floor`	0 – 100000	1	—

This setting takes effect immediately. Specifies a lower limit, in kilobits per second, for the bandwidth that is reserved by the PCoIP session.

This setting configures the minimum expected bandwidth transmission rate for the endpoint. When you use this setting to reserve bandwidth for an endpoint, the session does not have to wait for bandwidth to become available, which improves session responsiveness.

Make sure that you do not over-subscribe the total reserved bandwidth for all endpoints. Make sure that the sum of bandwidth floors for all connections in your configuration does not exceed the network capability.

The default value is 0, which means that no minimum bandwidth is reserved. When this setting is disabled or not configured, no minimum bandwidth is reserved.

This setting applies to the agent and client, but the setting only affects the endpoint on which it is configured.

PCoIP statistics interval

Directive	Range	Increment	Default
`Server statistics interval seconds`	0 – 65535	1	—

This setting takes effect immediately. Configuring this allows you to set an interval in seconds for logging performance statistics to the PCoIP server log. When not configured, logging is disabled by default.

PCoIP transport header

Directive	Options	Default
`Transport session priority`	High Priority Medium Priority (default) Low Priority Undefined Priority	—

This setting takes effect when you start the next session. Configures the PCoIP transport header.

PCoIP transport header is a 32-bit long header which is added to all PCoIP UDP packets (only if the transport header is enabled/supported by both sides). PCoIP transport header allows network devices to make better prioritization/Qos decisions when dealing with network congestions. The transport header is enabled by default.

The transport session priority determines the PCoIP session priority reported in the PCoIP Transport Header. Network devices make better prioritization/Qos decisions based on the specified transport session priority. The transport session priority value is negotiated by the PCoIP agent and client. If agent has specified a transport session priority value (high, medium, or low), then the session uses the agent specified session priority. If only the client has specified a transport session priority (high, medium, or low), then the session uses the client specified session priority. If neither agent nor client has specified a transport session priority (or specified 'undefined priority'), then the session uses/ defaults to the medium session priority.

PCoIP virtual channels

Directive	Options	Default
`Enable vchan`	Enable all virtual channels other than those in the list Disable all virtual channels other than those in the list	—
`Vchan list`	string *(up to **255** characters)*	—

This setting takes effect when you start the next session. Specifies the virtual channels that can or cannot operate over a PCoIP session.

There are two modes of operation:

- Enable all virtual channels except for <list> (default setting)
- Disable all virtual channels except for <list>

When specifying which virtual channels to include or not include in the list, the following rules apply:

- An empty list is allowed
- Multiple virtual channel names in the list must be separated by the vertical bar (|) character. For example: channelA|channelB
- Vertical bar or backslash () characters in virtual channel names must be preceded by a backslash. For example: the channel name "awk|ward\channel" must be specified as "awk|ward\channel" (without the double quotes)
- A maximum of 15 virtual channels are allowed in a single PCoIP session

The virtual channel must be enabled on both agent and client for it to be used.

Primary display resolution

Directive	Options	Default
`Host side primary display topology`	**1920x1200** **1920x1080** **1680x1050** **1680x1024** **1600x1200** **1600x1024** **1600x900** **1440x1050** **1440x900** **1280x768** **1280x1024** **1280x800** **1280x720** **1024x768** **800x600** **640x480**	1920x1080

This setting takes effect when you start the next session. Configuring this value will override the display resolution of the primary monitor for connections to the host. The value applies only to the PCoIP Standard Agent for Windows.

Proxy Access to a remote License Server

Directive	Options	Range	Increment	Default
`License proxy server`	string *(up to **511** characters)*			—
`License proxy port`		0 – 65535	1	—

This setting takes effect when you start the next session. If a proxy is required to access a local License Server or the Cloud License Server, enter those parameters here. These parameters are loaded only during agent startup.

Remote printing

Directive	Options	Default
`Remote printing enabled`	Basic and Advanced printing for Windows clients Basic printing Printing disabled	—
`Enable default printer`	Checked (on), Unchecked (off)	—

This setting takes effect when you start the next session, and applies on the host only. Basic Remote printing will only offer limited printing but has the advantage of using a generic printer driver on the host side. This ensures compatible printing but does not offer all features of the printer.

Advanced remote printing for Windows clients requires installation of the matching printer driver on the host side of the solution. In some cases the matching printer driver cannot be found for the host OS and/or the printer driver is not compatible with the printer. In those cases changing the printer setting to "Basic" should allow printing to those printers.

Remote printing is implemented as a virtual channel. If virtual channels are disabled, remote printing does not function.

When this setting is disabled or not configured, the default value of Basic remote printing is enabled.

The default value of unchecked for 'Automatically set default printer' will not change the default printer on the host when the client connects; the default printer, if set on the host, will be a host local/network printer. When checked, the default printer on the host will match the client's default printer within a session and will be reset to a host local/network printer upon client disconnection. This can allow for a user experience where printing can naturally occur close to the location of the client computer.

Session Automatic Reconnection Policy

Directive	Range	Increment	Default
`Session retry timeout`	0 – 120	1	20

This setting takes effect when you start the next session. This policy configures the automatic reconnection period, that is the amount of time a PCoIP Client and Server will attempt to reconnect an interrupted session without requiring the user to re-enter their logon credentials.

A session may be interrupted through network loss, for instance through pulling a network cable, disabling a network interface or moving away from a WiFi hotspot. In the case of portable computing devices closing a laptop lid or similar actions have the same effect. By default, when network connectivity returns within the specified time period, the session will be restored with no further user action being required.

If this setting is disabled or not configured, the default reconnect period is 20 minutes.

Setting this value to 0 disables the session automatic reconnection feature but allows for session reconnection as a result of intermittent short term network loss (between 30 and 60 seconds).

Timezone redirection

Directive	Options	Default
`Enable timezone redirect`	Checked (on), Unchecked (off)	On

This setting takes effect when you start the next session. Configuring this allows you to enable or disable timezone redirection. When not configured, timezone redirection is enabled by default.

Making a Connection from a PCoIP Client

Anyware Agent Deployment and Client Connectivity Requirements

Anyware clients can connect to your desktops hosted in proof-of-concept, cloud, or datacenter deployments. Requirements and network security levels will vary depending on your deployment type. See Supported Anyware Architectures for each deployment's components and requirements.

⚠ **Connection troubleshooting**

If you encounter issues while connecting, see the Troubleshooting Connection Issues for fixes to common issues.

Once you've installed and configured your Standard Agent for Windows, you're ready to accept incoming connections from remote *Anyware Clients*. PCoIP clients are remote endpoint devices available in as software or firmware and make secure PCoIP connections to the remote desktop through the installed Standard Agent for Windows.

Managing Client Connections

In most cases, Anyware clients connect to Anyware agents through a *connection broker*. The broker is responsible for matching users to their available desktops, and then establishing the PCoIP session with their selected resource.

Anyware agents do not need to be configured to use these brokering services. All relevant configuration is done at the broker, which then communicates with the agent.

Brokering Options

There are several ways you can manage client connections to remote desktops

Direct Connections

In direct connection scenarios—where a broker is not involved—the Anyware agent acts as its own broker. In these cases, a client user will provide the IP address or FQDN of the agent machine to their client, and the connection is made securely with no intermediate step.

Anyware Manager

Anyware Manager is a service, available as a cloud-based service or as an installable instance, that centrally manages PCoIP deployments. It enables highly scalable and cost-effective HP Anyware deployments by managing cloud compute costs and brokering PCoIP connections to remote Windows or Linux workstations.

Connection Manager

The **Connection Manager** is provided in a bundle with the **Security Gateway**, and allows self-managed brokering services. For information about the Connection Manager, including installation and configuration instructions, see the Connection Manager and Security Gateway documentation.

Third-party Connection Brokers

Anyware agents also support third-party connection brokers. For a current list of brokering partners, see Technology Partners on the website.

Additional Information

Information about **Anyware client connectivity requirements and usage instructions**, is available in the following documentation:

- Software clients:
  - Anyware Software Client for Windows
  - Anyware Software Client for macOS
  - Anyware Software Client for Linux

- Mobile Clients:
  - Anyware Mobile Client for iOS
  - Anyware Mobile Client for Android
  - Anyware Mobile Client for Chromebooks
- Zero clients:
  - Anyware Tera2 Anyware Zero Client

Zoom VDI for HP Anyware

Overview of Zoom VDI for HP Anyware

Zoom VDI for HP Anyware allows for an enhanced video conferencing performance in HP Anyware environments, by offloading the audio and video streams from Anyware agent devices to Anyware client devices. The client devices handle the processing of the video and audio streams, and directly transmit the streams to and from Zoom servers, thereby resulting in an improved conferencing experience.

How Zoom VDI for HP Anyware Works

Zoom VDI for HP Anyware makes use of the following two components, which are two separate programs, each with their physical installation location:

- Zoom VDI Client, which is installed on the Anyware Agent machines.
- Zoom Plugin, which is installed on each of the Anyware Client machines.

The Zoom VDI Client and the Zoom Plugin work in synchronization via the PCoIP session to render the Zoom meeting in layers, typically superimposing the meeting on the Anyware client window. Additionally, instead of using USB Redirection, the Zoom VDI Plugin utilizes the media devices of the client machines to send audio and video data to the Zoom server.

This eliminates the need for sending audio and video data from the client machines to the agent machines, and then to the Zoom servers, thereby resulting in significant improvement in video as well as audio quality. The reduction in latency ensures a seamless video conferencing experience, which is nearly identical to the execution of the Zoom application on local client machines.

Additional Reading

Further reading about Zoom VDI can be found on the Zoom Support site.

Zoom VDI Prerequisites

This section lists the prerequisites for installing and using Zoom VDI for HP Anyware.

- Windows Server 2012 or later, on Agent Machines
- Windows 7 or later, on Client Machines
- Software Agent for Windows 24.03 or later
- Software Client for Windows 24.03 or later
- Zoom VDI Client version 5.16.10 or later
- Zoom Plugin version 5.16.10 or later

Installation Workflow

Step	Description
I	Install or upgrade Graphics Agent for Windows to version 24.03 or later.
II	Install or upgrade Software Client for Windows to version 24.03 or later. For more information, see the Installing topic in the client guide.
III	Install or upgrade the Zoom VDI Client first on agent machines to ensure version compatibility.
IV	Install the Zoom Plugin on each client machines that will connect to the agent machine. For more information, see the "Installing the Zoom Plugin" topic in the client guide.

Note: Known Limitation

Currently, version 5.16.10 of Zoom VDI for HP Anyware does not support multi-monitor configuration. This will be addressed in future releases.

Installing the Zoom VDI Client

This topic contains instructions for installing the Zoom VDI Client on Agent machines.

Before you begin, make sure that you have administrator privileges on the agent machine on which you want to install the Zoom VDI Client.   1. On the agent machine, access the VDI releases and downloads page in a web browser.

1. Under **Compatible plugins**, locate the installer version. The version must be 5.16.10 or later.

> **Note: Version Parity**
>
> The Zoom VDI Client version you select must be the same or higher than the version of the Zoom Plugin on client machines.

2. Click either the **VDI client (32-bit)** link or the **VDI client (64-bit)** link, depending on your configuration. The **ZoomInstallerVDI.msi** file will be downloaded to your agent computer.
3. If connected to a PCoIP session, disconnect it.
4. Double-click the **ZoomInstallerVDI.msi** file to begin installation.
5. Follow the steps in the installation wizard to complete the installation.

> **Note: Use the Correct Application**
>
> The installation process creates the Zoom VDI application on the agent machine. If your agent machine also has the standard Zoom application, make sure that you select **Zoom VDI**, and NOT **Zoom**.

Security Guide

Security in PCoIP Agents

PCoIP requires a certificate to establish a session. By default, Anyware agents generate a self-signed certificate that secures the PCoIP session. Each component in the PCoIP system can generate these self-signed certificates, which will automatically work together without requiring any configuration.

You can, if needed, create and deploy your own custom certificates instead of relying on HP's self-signed certificates. This section explains how to create and implement custom certificates.

Using Custom Security Certificates

You can use OpenSSL, Microsoft Certification Authority, or a public certificate authority (CA) of your choice to create your certificates. If you are not using OpenSSL, consult your certificate authority's documentation for instructions on creating certificates in a Windows Certificate Store-compatible format.

The procedures is this section use OpenSSL to generate certificates that will satisfy most security scanner tools when the root signing certificate is known to them.

⚠ **Caution: Certificates are stored in the Windows Certificate Store**

```
Certificates are stored in the Windows certificate store. If you have old
certificates that are stored on the host, they should be deleted to avoid
conflicts or confusion.
```

Custom Certificate Guidelines

If you choose to use your own certificates, follow these general guidelines:

Save your root CA signing certificate in a safe place for deployment to clients.

Back up private and public keys to secure locations.

Never store files created when generating keys or certificates on network drives without password protection.

Once certificates have been deployed to the Windows certificate store, the files they came from are no longer needed and can be deleted.

Standard automatic tools, such as Automatic Certificate Enrollment and Group Policy, can be used for deploying automatically generated certificates. Both Automatic Certificate Enrollment and Group Policies are implemented through Active Directory. See MSDN Active Directory documentation for more information.

Pre-session Encryption Algorithms

Connections are negotiated using the following supported RSA cipher suites:

- TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384
- TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384
- TLS_AES_256_GCM_SHA384

Note: Minimum SSL version

These Max Compatibility security level cipher suites have a minimum required SSL version of TLS 1.2.

In-session Encryption Algorithms

Once a PCoIP session has been negotiated and the connection established, all PCoIP communications are secured by the AES-256-GCM session encryption algorithm. These settings can be configured on the agent.

Creating And Installing Custom Certificates

This section describes how to replace HP's default certificates with your own custom certificates.

Note: These procedures use OpenSSL

The procedures in this section use OpenSSL to create private keys, certificate signing requests, and certificates. To use OpenSSL, install Visual C++ 2008 Restributables and Win32 OpenSSL Light v1.0.2g+.

For detailed information about OpenSSL, refer to OpenSSL documentation.

To replace HP's default certificates with custom certificates:

1. Install required OpenSSL components on your system.
2. Create the internal root CA certificate.
3. Create a private key and certificate pair for the Anyware agent.
4. Configure the certificate mode for each desktop.
5. Install the internal root CA in your Anyware clients.

Installing OpenSSL Requirements

Install the following components on your Windows machine:

- Visual C++ 2008 Redistributables
- Win32 OpenSSL v1.0.2g Light (or later).

  When prompted during OpenSSL installation, copy the OpenSSL DLLs to the OpenSSL binaries directory; for example, C:\OpenSSL-Win32\bin.

Note: Examples use the default installation directory

The following examples assume the default OpenSSL installation directory: `C:\OpenSSL-Win32`.

Creating the Internal Root CA Certificate

This section shows how to create a root CA private key, how to use this key to self-sign and generate an internal root CA certificate, and how to add X.509 v3 extensions to a certificate that restrict how the certificate can be used.

Creating a Root CA Private Key

To create a root CA private key in RSA format:

1. Open a command prompt and navigate to the OpenSSL binaries directory (`c:\OpenSSL-Win32\bin`).
2. Type `openssl` and press `Enter` to launch OpenSSL.

> **Note: OpenSSL may need help finding the .cfg file**
>
> If you see the following error, you will need to set the OPENSSL_CONF variable before proceeding.
>
> ```
> WARNING: can’t open config file: /usr/local/ssl/openssl.cnf
> ```

3. To create 3072-bit root RSA key named *rootCA.key*, use one of the following commands:

    - For an *unsecured* key, type:

      ```
      genrsa -out rootCA.key 3072
      ```

    - For a *password-protected* key, add the -des3 argument:

      ```
      genrsa -out rootCA.key -des3 3072
      ```

   Password-protected keys require the password to be entered each time they are used.

> **Caution: Store your private root key in a safe location**
>
> Anyone with access to your private root key can use it to generate certificates that your PCoIP clients will accept.

Setting the OPENSSL_CONF variable

If OpenSSL is unable to find its configuration file, you may need to set the OPENSSL_CONF variable.

To set the OPENSSL_CONF variable:

1. Exit OpenSSL.
2. Type the following command:

   ```
   set OPENSSL_CONF=C:\OpenSSL-Win32\bin\openssl.cfg
   ```

3. Type `ssl` and press `Enter` to continue with the step you were performing when you saw the error.

Self-signing and Creating the Internal Root CA Certificate

Now that we have our private key, we will use it to generate a self-signed X.509 root CA certificate called **rootCA.pem** that is valid for 1095 days (1095 days is three years, ignoring leap days).

To create the root CA certificate:

1. Type the following command. This example creates a certificate that is valid for 3 years (1095 days). Change the `-days` parameter to customize the certificate lifetime:

   ```
   req -x509 -new -nodes -key rootCA.key -days 1095 -out rootCA.pem
   ```

   An interactive script will run, which prompts you to enter values for several fields.

2. Follow the prompts to enter field values:

Field	Notes
Country Name	Optional. Use one of the ISO 3166-1 alpha-2 country codes.
State or Province Name	Optional
Locality name	Optional
Organization Name	Optional
Common name	**Required**. Enter a name for your root CA (for example, certificates.mycompany.com)
Email address	Optional. Enter an administrative alias email if you use this field.

Note: Field values can be templatized

If you will be creating a lot of certificates, consider using a configuration file that contains global field values. See http://www.openssl.org/docs for more information.

Creating a Private Key and Certificate for the Anyware Agent

For each Anyware Agent instance, you will create three items:

- A private key file
- A certificate signing request (CSR)
- A certificate

You will also need an X.509 v3 extension file, which is used as an input when generating the workstation certificate.

Note: There are two different private keys

The private key you create here is used by the Anyware Agent to decrypt data. It is different from the internal root CA private key.

Creating an X.509 Version 3 Extension File

X.509 Version 3 extensions restrict how certificates can be used.

To create the X.509 v3 extension file:

1. Using a text editor, open a new file and paste the following text into it:

```
authorityKeyIdentifier=keyid,issuer
basicConstraints=CA:TRUE
keyUsage=digitalSignature, nonRepudiation, keyEncipherment,
dataEncipherment
subjectAltName=email:test@mycompany.com
```

2. Save the file with an **.ext** extension (for example, `v3.ext`).
3. Store the file in the `C:\OpenSSL-Win32\bin directory`.

Note: More about X.509 v3 extensions

For more information about X.509 v3 certificate extensions, see https://www.openssl.org/docs/apps/x509v3_config.html.

Creating the Private Key and Certificate

To create the Anyware Agent's private key, certificate signing request, and certificate:

1. Launch **openssl** from the `C:\OpenSSL-Win32\bin` directory.
2. Create a *3072-bit private key* in RSA format:

   ```
   genrsa -out pcoipprivate.pem 3072
   ```

   This command creates a pcoipprivate.pem file in the current directory.
3. Create a *certificate signing request*:

   ```
   req -new -key pcoipprivate.pem -out pcoip_req.csr
   ```

   This command initiates an interactive script that prompts you to enter certificate metadata.

   You may be prompted for a challenge password and company name.

   The **Common Name** field must be the fully-qualified domain name (FQDN) of the desktop where the Anyware Agent is installed for example, `mypcname.mydomain.local`. If you want to use the same certificate on multiple machines in the same domain, use a wild card for all but the last two segments of the FQDN: `*.mydomain.local`.

   When finished, this command creates a `pcoip_req.csr` file in the current directory.
4. Sign and create an *X.509 v3 certificate*. This example creates a certificate valid for one year (365 days). To customize the certificate lifetime, change the `-days` parameter:

   ```
   x509 -req -outform PEM -in pcoip_req.csr -extfile v3.ext -CA rootCA.pem -
   CAkey rootCA.key -CAcreateserial -sha256 -out pcoipcert.pem -days 365
   ```

   This command creates a *poipcert.pem* file in the current directory.

⚠ Caution: Use Secure Hash Algorithms

Windows Certificate Manager has deprecated the use some older hash algorithms such as MD4, MD5, and SHA1. Use SHA-384 or SHA-256 when creating your certificates.

5. Create a *PKCS#12 file* to import into a Windows certificate store. Replace `<password>` with your password:

   ```
   pkcs12 -export -in pcoipcert.pem -inkey pcoipprivate.pem -name PCoIP -out
   pcoipagent.p12 -password pass:<password>
   ```

   This command creates a `pcoipagent.p12` file in the current directory.

   Note: The -name parameter must be 'PCoIP'

   You must specify `PCoIP` as the `-name` parameter value. This value sets the certificate's friendly name.

6. Place the `pcoipagent.p12` and `rootCA.pem` files where administrative users of the Anyware agent can access them, such as on network storage or on a USB key.

Installing the Private Key and Certificate on the Anyware agent Desktop

The agent certificate and signing certificate must be installed on each desktop running a Anyware agent.

To install the agent certificate and signing certificate:

1. Open the Microsoft Management Console on the agent machine:
    a. Press ⊞ + `r` to open the run dialog
    b. type `mmc` and press `Enter`.
2. Add the Certificates snap-in:
    a. Select **File** > **Add/Remove Snap-in**.
    b. Select **Certificates** from the Available snap-ins list and click **Add**.
    c. Select **Computer account** and click **Next**.
    d. Select **Local computer** and click **Finish**.
    e. Click **OK**.
3. Add `rootCA.pem` to the 's Trusted Root Certification Authorities list:
    a. Expand **Certificates (Local Computer)**.
    b. Right-click **Trusted Root Certification Authorities**, select **All Tasks** > **Import from the context menu**, and click **Next**.
    c. Use the Browse button to navigate to the directory where the `rootCA.pem` file is located.
    d. Select **All Files (*.*)** from the File name drop-down list, and select the `rootCA.pem` file.
    e. Click **Open**, **Next** (twice), and **Finish**.
    f. Click **OK** to close the *The import was successful* message.
4. Add `pcoipagent.p12` to the Personal store of the agent's computer account:
    a. Expand **Certificates (Local Computer)**.
    b. Right-click **Personal**, select **All Tasks** > **Import** from the context menu, and click **Next**.

c. Select **Personal Information Exchange (*.pfx;*.p12)** from the File name drop-down list, and select the `pcoipagent.p12` file.

d. Click **Open** and **Next**.

e. Type the certificate password.

f. Ensure these settings are correct:

- **Mark this key as exportable...** is enabled
- **Include all extended properties** is enabled

g. Click **Next** twice and **Finish**.

h. Click **OK** to close the The import was successful message.

5. Restart the Anyware agent service on the workstation:

a. Open Control Panel and select **Administrative Tools**.

b. Double-click **Services**.

c. Select your Anyware agent service in the Services list.

d. Click **Restart the service**.

Installing the Internal Root CA Certificate in a Anyware client

Your root CA certificate must be installed in any Anyware client that will be used to connect to the Anyware agent.

Installing Root CA Certificates on a Zero Client

Zero clients are managed via an Administrative Web Interface (AWI) and accessed using a web browser. Supported browsers are:

- Firefox 86
- Chrome 60
- Internet Explorer 11
- Microsoft Edge 25

> **Note: Browser must support TLS**
>
> Web browsers must support TLS 1.2 or later to connect to the zero client's Administrative Web Interface.

To upload the root CA certificate to a zero client:

1. From a supported browser, enter the IP address of the zero client and log in to its Administrative Web Interface.
2. Select the **Upload** > **Certificate** menu to display the *Certificate Upload* page.
3. In the *Certificate filename* field, click **Browse**, and then navigate to the directory that contains your root CA certificate.
4. Select your root CA certificate (`.pem`) and then click **Open*.
5. Click **Upload** and then **OK**.
6. Click **Continue**.

If the certificate uploads successfully, it will appear in the Uploaded Certificates section on this page.

Installing Root CA Certificates on a Mobile Client

Before you can install the root CA certificate in an Anyware Mobile Client, you must change the file extension from `.pem` to `.crt`.

The `.pem` extension is used for different types of X509 v3 files that contain ASCII Armor (Base64) data prefixed with a "-----BEGIN" line. The `.crt` extension is used for certificates that may be encoded either in binary DER format or ASCII PEM format.

Installing Root CA Certificates in the Anyware Software Client for macOS

> **Important: Root CA Certificate must have a .crt extension**
>
> You must change the root CA certificate's extension from `.pem` to `.crt` before installing it on a Anyware Software Client.

In macOS, certificates are stored in the Keychain Access application.

To import your root CA certificate in the Anyware Software Client for macOS:

1. Copy your root CA certificate file (*.crt) to the Mac client desktop.
2. Double-click **Applications** > **Utilities Keychain Access.app** to open Keychain Access.
3. Select **File** > **Import Items**.
4. Navigate to the desktop and then select your root CA certificate.
5. In the Destination Keychain drop-down menu, select **System**, and then click **Open**.
6. If prompted, enter your Keychain Access password and then click **Modify Keychain**.
7. At the next screen, click **Always Trust** when asked whether you want your computer to trust certificates signed by this certificate.
8. If prompted, enter your Keychain Access password and then click **Update Settings**.

After the certificate installs successfully, it appears in the *System* > *Certificates* list.

Installing Root CA Certificates in the Anyware Software Client for Windows

Important: Root CA Certificate must have a .crt extension

You must change the root CA certificate's extension from `.pem` to `.crt` before installing it on a Anyware Software Client.

Note: Windows must trust your root certification authority

When you use your own private key and certificate, you must add your internal root CA certificate to the Windows Trusted Root Certification Authorities certificate store on the client computer.

Users without a trusted root CA will receive an Unable to get local issuer certificate error and fail to connect.

The following instructions explain how to add a root CA certificate to the Trusted Root Certification Authorities store on a client PC using Microsoft Management Console.

Note: Active Directory group policies

For information on using Active Directory Group Policy to distribute certificates to client computers, see http://technet.microsoft.com/en-us/library/cc772491.aspx.

To import the root CA certificate for the Anyware Software Client for Windows:

1. Copy your root CA certificate file (*.crt) to a directory reachable by your Windows client.
2. Open the Microsoft Management Console on the agent machine:
    a. Press ⊞ + `r` to open the run dialog

    b. type `mmc` and press `Enter`.
3. Add the Certificates snap-in:
    a. Select **File** > **Add/Remove Snap-in**.

    b. Select **Certificates** from the Available snap-ins list and then click **Add**.

    c. Select **My user account** and then click **Finish**.

    d. Click **OK**.

4. Import the root CA certificate:
    a. Expand **Certificates - Current User**.
    b. Right-click on **Trusted Root Certification Authorities**, select **All Tasks** > **Import** from the context menu, and then click **Next**.
    c. Use the Browse button to navigate to the directory where your root CA certificate is located and select your root CA certificate.
    d. Click **Open** and then **Next**.
    e. Select the option to place all certificates in the Trusted Root Certification Authorities certificate store.
    f. Click **Next** and then **Finish**.
    g. At the security warning, click **Yes**.

After the certificate installs successfully, it appears in the Trusted Root Certification Authorities > Certificates list.

Installing in a Anyware Mobile Client

To install your internal root CA certificate on an iOS, Android, or ChromeOS device, consult the documentation for your device. The Anyware Mobile Client software does not implement certificate installation.

Verifying Certificate Formats

If you have OpenSSL installed on your system, you can use it to verify that your root CA certificate is in ASCII PEM format.

To verify that the root CA certificate is in ASCII PEM format:

1. Launch **openssl** from the `C:\OpenSSL-Win32\bin` directory.
2. Type the following command:

```
x509 -in rootCA.pem -text -noout
```

If your certificate contents successfully display on the screen, it is encoded correctly as a PEM file.

Configuring the Agent Certificate Mode

The Anyware Agent chooses a certificate based on the parameters set in the *Configure PCoIP Security Certificate Settings* GPO variable.

Since Anyware agents automatically generate and use self-signed certificates by default, you only need to configure the Configure PCoIP Security Certificate Settings GPO variable if you are deploying your own custom certificates.

You can configure Anyware Agents to handle certificates in the following ways:

- Always use self-signed certificates (default)
- Always use local custom certificates
- Attempt to use a local certificate, and revert to self-signed if not found

> **Note: Import the administrative template file before configuring**
>
> The Configure License Server Path GPO variable only appears in the GPO editor after you import the administrative template file.

The example in this section configures the agent to look for the certificate only in the remote workstation's Windows certificate store. The example also gives the store the friendly name of "PCoIP". These settings are mandatory when you deploy your own custom certificates.

To configure the Configure PCoIP Security Certificate Settings GPO variable with a custom certificate:

1. Open the Local Group Policy Editor on the agent machine:
    a. Press ⊞ + `r` to open the run dialog
    b. type `gpedit.msc` and press `Enter`.
2. Navigate to *Local Computer Policy > Computer Configuration > Administrative Templates > PCoIP Session Variables > Not Overridable Administrator Defaults*
3. Double-click **Configure PCoIP Security Certificate Settings** to open the variable's dialog.
4. Select **Enabled** to enable the setting.

5. In the *How the Anyware agent chooses the certificate...* drop-down list, select **From the Certificate Store**. A search field will appear next, labelled *Name of the Certificate Store to search for CA-signed certificates*.
6. In the search field, enter the name for the certificate in the Windows Cert store. This should be the *friendly name* of the CA signed cert which appears in the store.
7. In *The minimum key length...* drop-down list, select the desired minimum key length (in bits). If you're unsure, specify the actual length of the cert you're using.
8. Click **OK**.
9. Close the Local Group Policy Editor and reboot the desktop to apply your settings.
10. After the Anyware agent restarts, you can verify that it is using your custom certificate by checking the agent's level 2 log files.

Reference

Install GPO Template Files

GPO template files are automatically imported by the Standard Agent for Windows installer, *except* on domain controllers. You must manually import the files into the domain controller's Group Policy Editor.

To import the template on a domain controller:

1. Copy the **admx** file from

   ```
   bash
   C:\Program Files\Teradici\PCoIP Agent\configuration\policyDefinitions\PCoIP.admx
   ```

   to

   ```
   bash
   C:\Windows\PolicyDefinitions
   ```

2. Copy the **adml** file from

   ```
   bash
   C:\Program Files\Teradici\PCoIP Agent\configuration\policyDefinitions\en-US\PCoIP.adml
   ```

   to

   ```
   bash
   C:\Windows\PolicyDefinitions\en-US
   ```

Configuring the Leostream Connection Broker for Smart Card Authentication

If the **Subject Alternative Name** in the Smart Card certificate is in the @ format, you must use the Leostream connection Broker version 2023.2.3.4 and Connection Manager version 23.12 or later. Direct connections are not supported in this scenario.

This topic describes how to configure the Leostream Connection Broker for Smart Card authentication.

Prerequisites

Before configuring the Leostream Connection Broker, make sure that:

- An Active Directory is set up for your deployment.
- A Certificate Authority (CA) is available in the Active Directory for signing user certificates during logon using smart cards.
- A CA certificate or a CA bundle file (if the CA that signs user certificates is not the root CA) is available.

Configuration Process

Note: Additional Reading

For detailed instructions on the configuration process, see this Quick Start Guide.

1. Install the Leostream Connection Broker version 2023.2.3.4 or later.
2. Log in to the Connection Broker Web Interface. The web interface is available at the following URL: https:<Leostream broker machine IP address>

Note: Configuration Details

Step 3 through **Step 8** only describe configuration that is essential. You can choose to set the remaining configuration options as necessary.

3. Enable Smart Card support:
   a. Go to **Configuration** > **Locations**.
   b. Click **Create Location**.
   c. Under **Attribute Selection**, set the **Client Attribute** to "Device Type", **Conditional** to "is equal to", and **Value** to "PCoIP".
   d. Select **Require PIV smart card for login**.
4. Add the Authentication Server:
   a. Go to **Setup** > **Authentication Servers**.
   b. Click **Add Authentication Server**.
   c. On the **Add Authentication Server** page, provide the Active Directory Server details.
5. Under **Connection Settings** do the following:
   a. Set **Specify address using** to "Hostnames or IP addresses".
   b. Provide the **Hostname or IP address** and **Port** values.
   c. Set **Algorithm for selecting from multiple addresses** to "Random".
   d. Set **Type** to "Active Directory".
6. Under **Search Settings**, enter the username and password for an account that has permissions to search for other users.
7. Save your changes.
8. Upload the CA certificate or the CA bundle file:
   a. Obtain the CA certificate or the CA bundle file.
   b. Go to **Setup** > **Authentication Servers**.
   c. Open the Active Directory server you added in step 4.
   d. Under **Smart/PIV Card Authentication**, click **Choose File**, and upload the CA certificate or the CA bundle file.
   e. Save your changes.

Troubleshooting and Support

Support

Contacting Support

If you encounter any problems installing, configuring, or running the Standard Agent, you can create a support ticket with HP.

Before creating a ticket, be prepared with the following:

- A detailed description of the problem
- Your agent version number (how do I find my version number?)
- A prepared support file

The HP Community Forum

The Community Forum enables users to have conversations with other IT professionals to learn how they resolved issues, find answers to common questions, have peer group discussions on various topics, and access the Technical Support Service team. The HP staff are heavily involved in the forums.

To visit the HP community, go to https://communities.teradici.com.

Finding the Agent Version Number

You can find your Anyware Agent's version number using the PCoIP Control Panel or the Windows Control Panel.

To find your version number using the PCoIP Control panel:

1. Click in the Windows system tray and select **Updates** from the context menu.

   The control panel appears with the Updates tab selected.
2. The installed software version appears in the *Status* box of the Updates tab.

To find your agent's version number using the Windows control panel:

1. Open the Windows Control Panel, and navigate to Uninstall a program.
2. Find the Anyware agent type and version number in the program list.

Creating a Technical Support File

We may request a support file from your system in order to troubleshoot and diagnose issues. The support file is an archive containing Anyware Standard Agent for Windows logs and other diagnostic data that can help support diagnose your problem.

You can create a support file using the PCoIP control panel. If the PCoIP control panel is disabled, you can also run the bundling application directly using Windows Explorer or from the command line.

Both methods place a support bundle in the Support folder, located at `C:\ProgramData\Teradici\Support`.

To create a support file with the PCoIP Control Panel:

1. Open the PCoIP Control Panel in the system tray.
2. Select the *Support* tab and then click the **Create Support File** button.
3. When the zipped support file is ready, an Explorer window opens and displays your Support folder. The generated file is selected.

To create a support file with the bundling application:

1. Using Windows Explorer or a command line tool, navigate to `C:\Program Files\Teradici\Anyware Agent`.
2. Run `SupportBundler.exe`.
3. When the zipped support file is ready, an Explorer window opens and displays your Support folder. The generated file is selected.

Troubleshooting

Performing Diagnostics

Each Anyware component creates and updates a log file which records its activity as the system is used. Most troubleshooting within a Anyware system begins by examining these log files and looking for error conditions or other indications that may explain why the system is not operating as expected.

Log files for the Standard Agent for Windows and other Anyware components are saved to log directories.

The Windows Event Viewer also contains event logs for high-level events.

Note: Bundling log files for support

When investigating issues with HP support, you may need to provide a support file which includes system log files. Instructions are provided here.

Troubleshooting Licenses

Troubleshooting License Issues

The license troubleshooting utilities are included with the Standard Agent for Windows. These utilities allow you to validate your licenses and list license entitlements.

VALIDATE LICENSES

`pcoip-validate-license` scans your local system and any connected physical or cloud-based license servers for active licenses, and lets you know when your license subscription expires. For more information, see Welcome to Cloud Licensing.

To run the license validation tool, open a PowerShell window, navigate to the PCoIP Agent directory, and type:

```
./pcoip-validate-license.ps1
```

For more detailed instructions, open a PowerShell window and type:

```
get-help ./pcoip-validate-license.ps1
```

LIST LICENSE

`pcoip-list-licenses` retrieves and displays all license entitlements on a connected physical or cloud-based license server.

To run the license list tool, open a PowerShell window, navigate to the Anyware agent directory, and type:

```
./pcoip-list-licenses.ps1
```

For more detailed instructions, open a PowerShell window and type:

```
get-help ./pcoip-list-licenses.ps1
```

TRACKING USAGE OVER TIME

HP Local License Server users can use our open-source script, which displays the maximum HP Anyware license concurrent usage for a license server over time. For more information, refer to our Github page.

HP Cloud Licensing users can write a short script that runs `pcoip-list-licenses` periodically (for example, every 60 minutes) on any Anyware agent machine to track license usage.

Managing Session Licenses Using the PCoIP Control Panel

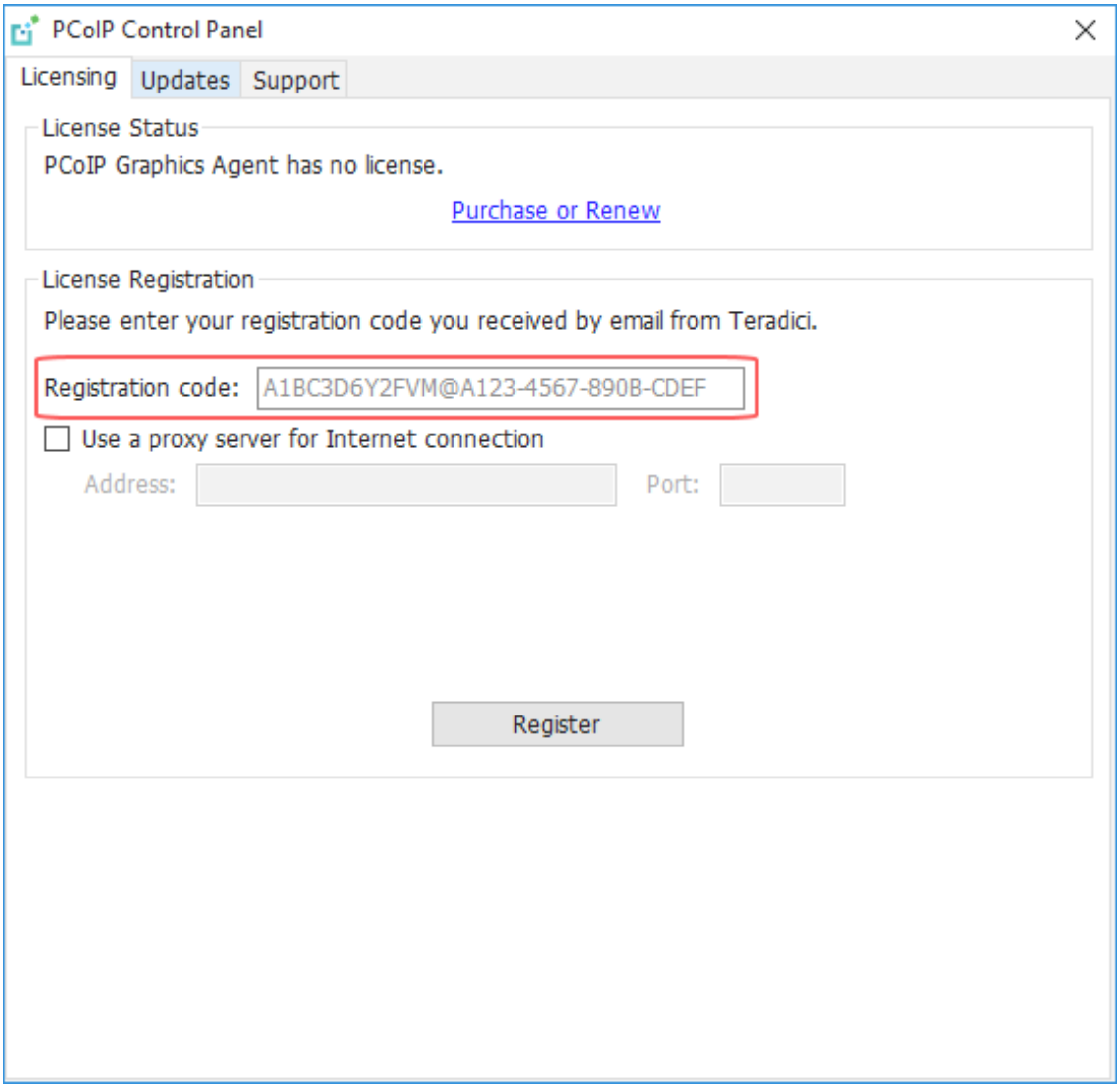
You can use the PCoIP Control Panel to register a license, check the status of a license, and renew a license.

The PCoIP Control Panel can be opened using either of these methods:

- Click Ⓠ in the Windows system tray
- Open a command line tool and run

```
"C:\Program Files\Teradici\PCoIP Agent\bin\pcoip_control_panel.exe"
```

If you have not registered your license already, select the **Licensing** tab and enter your registration code, as shown next.



License Status

PCoIP Graphics Agent has no license.

License Registration

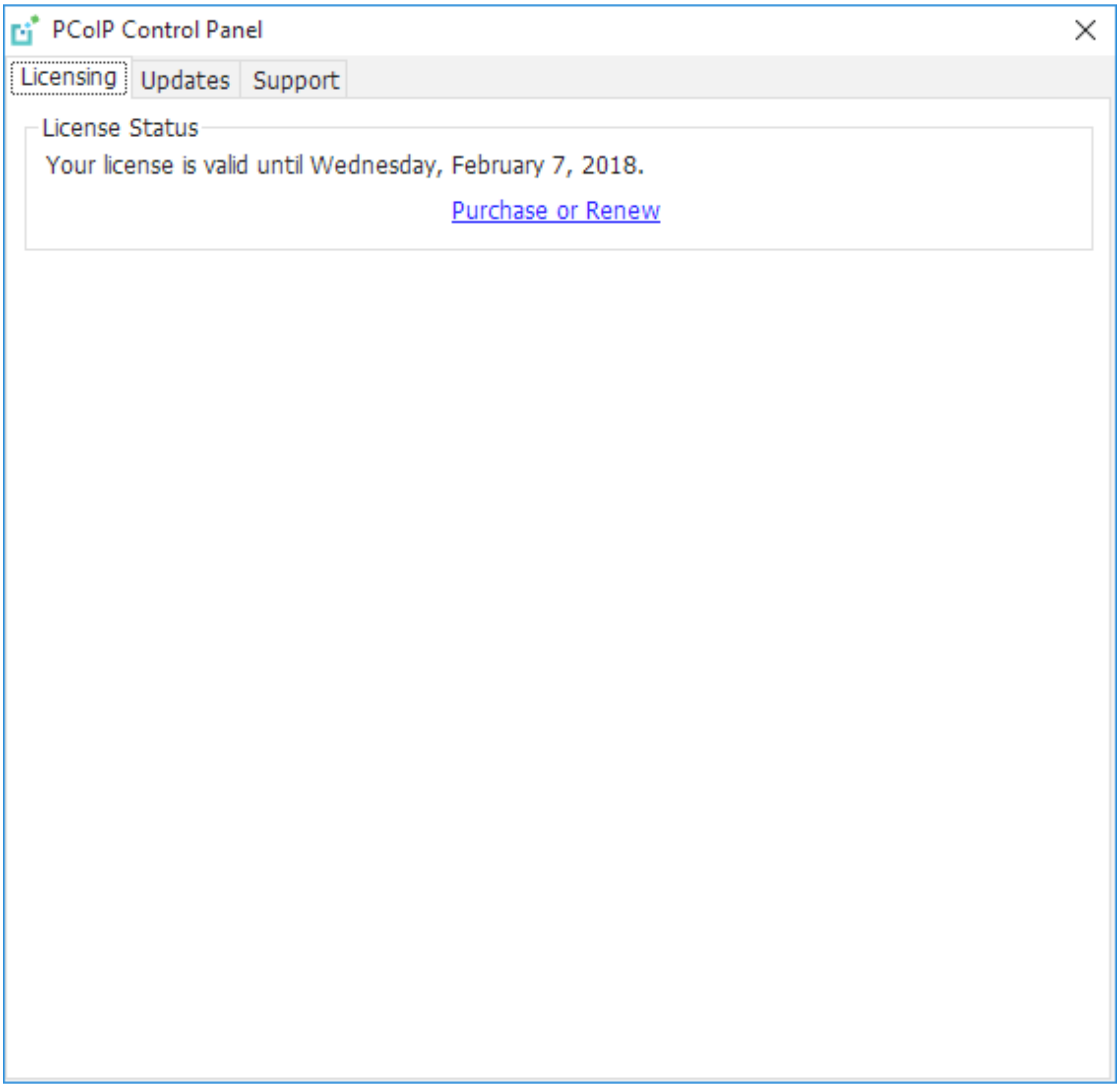
Please enter your registration code you received by email from Teradici.

Registration code: A1BC3D6Y2FVM@A123-4567-890B-CDEF

☐ Use a proxy server for Internet connection

Address: Port:

Once you are licensed, the tab will show your license subscription expiry information, and enables you to renew the license.



Your license is valid until Wednesday, February 7, 2018.

Logs

Locating Agent Log Files

Log files for the Anyware agent are located in the following directories by default. If you changed your agent's location during installation, the log files will be in your custom location instead.

Component	Log file location
Standard Agent for Windows	`%programdata%\Teradici\PCoIPAgent\logs`
PCoIP Server	`%programdata%\Teradici\PCoIPAgent\logs`

Note: Bundling log files for support

When investigating issues with HP support, you may need to provide a support file which includes system log files. Instructions are provided here.

Setting Log Levels

Each Anyware component is configured to log events. The amount of information captured can be configured by setting the log verbosity on a scale from 0 (least verbose) to 3 (most verbose). By default, the Standard Agent for Windows records log events at level 2.

When troubleshooting a particular problem, HP Support Services may recommend adjusting the log level for specific components to obtain more information from certain parts of the system.

To change the verbosity level, specify a new *Event Filter Mode* setting. For help changing agent configuration settings, see Configuring the Standard Agent for Windows.

Session Log IDs

At the start of each PCoIP session, a unique session ID is generated by the Anyware Client and passed to all connected Anyware components (including the agent). Log messages generated by the agent are prefixed with this session ID, making it easy to identify All log messages generated during a single session, by any Anyware component, will be prefixed with the same session log ID in RFC-4122 format:

```
yyyy-mm-ddThh:mm:ss.ffffffZ xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx > …
```

For example:

```
2015-11-06T08:01:18.688879Z 4208fb66-e22a-11d1-a7d7-00a0c982c00d > …
```

Log messages that do not pertain to a specific session will show a string of zeroes in place of the session log ID number.

If a Anyware component does not receive a session log ID from the Anyware client, or receives an invalid value, it will generate a new session log ID and distribute it to the other components in the system.

Viewing Windows Event Viewer Anyware Agent Logs

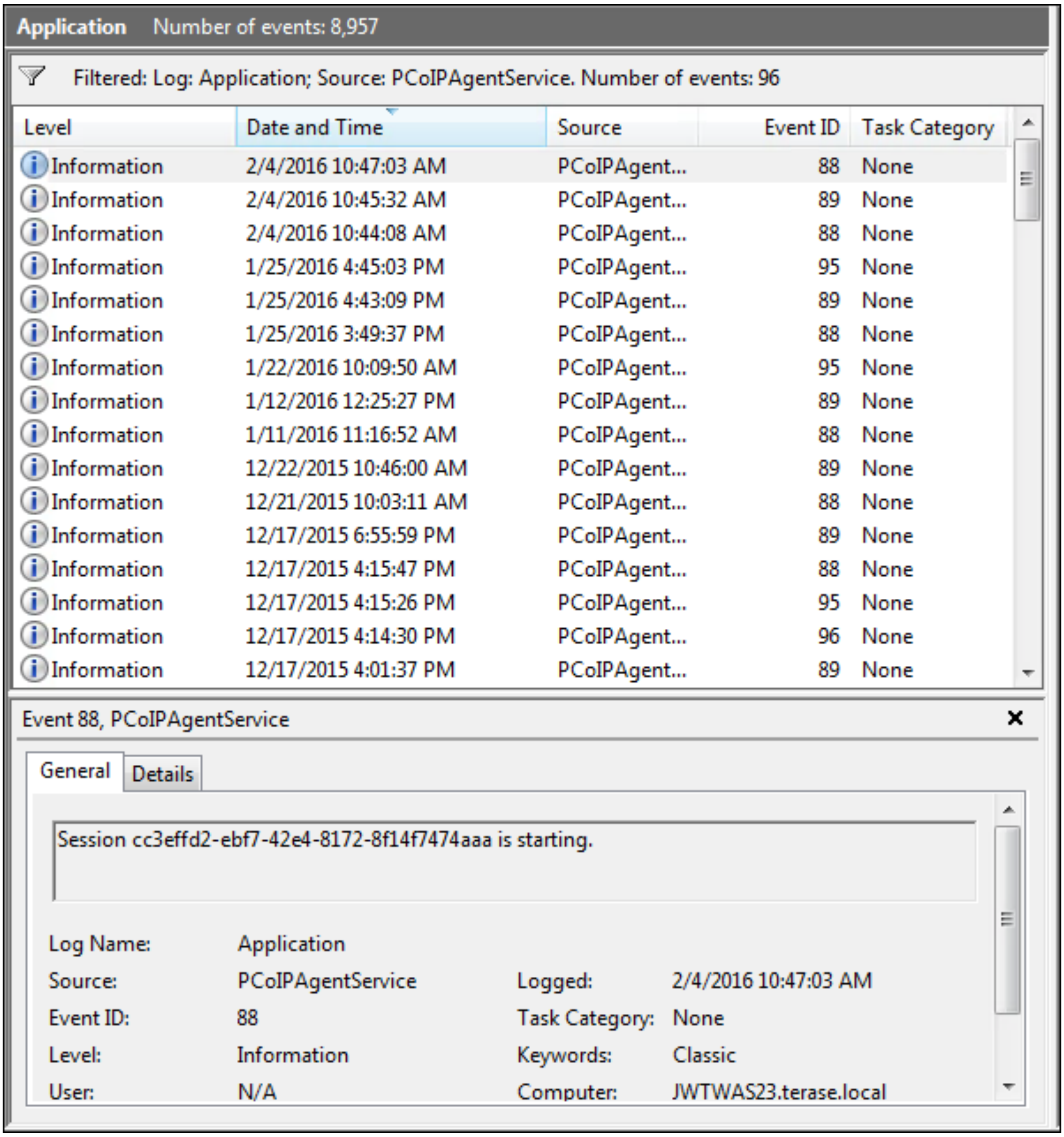
You can view high-level session and connection events generated by the Anyware agent and Anyware Manager in the Windows Event Viewer.

Anyware Agent Events

To view events using the Windows Event Viewer:

1. Navigate to *Start* > *Control Panel* > *System and Security* > *Administrative Tools* and double-click **Event Viewer**.
2. Navigate to *Event Viewer (Local)* > *Windows Logs*, right-click **Application**, and select **Filter Current Log**.
3. In the *Event sources* drop-down list, select **PCoIPAgentService** and click **OK**.
4. Select an event to view its details.

The next example shows typical Anyware agent session and connection events that you can view in the Windows Event Viewer.



Application Number of events: 8,957

Filtered: Log: Application; Source: PCoIPAgentService. Number of events: 96

Level	Date and Time	Source	Event ID	Task Category
Information	2/4/2016 10:47:03 AM	PCoIPAgent...	88	None
Information	2/4/2016 10:45:32 AM	PCoIPAgent...	89	None
Information	2/4/2016 10:44:08 AM	PCoIPAgent...	88	None
Information	1/25/2016 4:45:03 PM	PCoIPAgent...	95	None
Information	1/25/2016 4:43:09 PM	PCoIPAgent...	89	None
Information	1/25/2016 3:49:37 PM	PCoIPAgent...	88	None
Information	1/22/2016 10:09:50 AM	PCoIPAgent...	95	None
Information	1/12/2016 12:25:27 PM	PCoIPAgent...	89	None
Information	1/11/2016 11:16:52 AM	PCoIPAgent...	88	None
Information	12/22/2015 10:46:00 AM	PCoIPAgent...	89	None
Information	12/21/2015 10:03:11 AM	PCoIPAgent...	88	None
Information	12/17/2015 6:55:59 PM	PCoIPAgent...	89	None
Information	12/17/2015 4:15:47 PM	PCoIPAgent...	88	None
Information	12/17/2015 4:15:26 PM	PCoIPAgent...	95	None
Information	12/17/2015 4:14:30 PM	PCoIPAgent...	96	None
Information	12/17/2015 4:01:37 PM	PCoIPAgent...	89	None

Event 88, PCoIPAgentService

Session cc3effd2-ebf7-42e4-8172-8f14f7474aaa is starting.

Log Name:	Application		
Source:	PCoIPAgentService	Logged:	2/4/2016 10:47:03 AM
Event ID:	88	Task Category:	None
Level:	Information	Keywords:	Classic
User:	N/A	Computer:	JWTWAS23.terase.local

Key events to watch for in the event viewer logs:

Event ID	Key	Notes
88	SESSION_START	The PCoIP session started.
89	SESSION_END	The PCoIP session stopped.
90	LAUNCHER_EXIT	
91	CONNECTION_TIMEOUT	The console session connection timed out.
92	CONNECTION_FAILURE	The console session connection failed.
93	SESSION_REDIRECTION	
94	SESSION_INTERRUPTION	The console session connection was suspended.
95	SERVICE_STARTING PCoIP	Agent service starting.
96	SERVICE_STOPPING PCoIP	Agent service stopping.
97	SESSION_RESUMING	
98	VIDEO_DRIVER_REPAIR_ERROR	
99	FLEXERA_SERVICE_ERROR	An error in the Revenera service occurred.
100	VCHAN_LOADER_EXCEPTION	An exception was thrown in a PCoIP virtual channel plugin.
101	NO_AGENT_ERROR	The Anyware agent process could not be detected.
102	VCHAN_LOADER_INTERNAL_ERROR	An internal error has occured.
103	VCHAN_LOADER_BAD_INVOCATION_ERROR	The PCoIP virtual channel loader utility was invoked incorrectly.
104	AGENT_PROCESS_TERMINATED_ERROR	The Anyware Agent process was terminated.
105	SSO_PIPE_CREATION_ERROR	The Single Sign On framework was unable to establish a secure connection with the Anyware Agent.
106	MANUAL_DISCONNECT	The PCoIP session was disconnected by the user.
107	USER_SIGNOUT_SWITCH	The PCoIP session was disconnected by a user logout or user switch.
108	SHUTDOWN_RESTART_SLEEP	The PCoIP session was disconnected by a machine shutdown, restart, or sleep event.
112	SERVICE_START_ERROR PCoIP	Agent service cannot be started.
113	SERVICE_INTERNAL_ERROR	The PCoIP Service encountered an internal error.
114	SERVICE_ADMINISTRATIVE_MESSAGE	PCoIP service administrative message.
115	SERVICE_SHUTDOWN	A shutdown of the server machine was initiated.

Anyware Manager Events

If you are using Anyware Manager to start and stop your host machines, the CAMIdleShutdown process will log events as well. Follow the same procedure

Event ID	Description
95	CAM Idle Machine Shutdown service starting
96	CAM Idle Machine Shutdown service stopping
114	Machine will be checked for idle state.
115	Shutting down idle machine.

Frequently Asked Questions

Can I use a screensaver?

Yes. However, a blank, static screensaver will provide the most efficient CPU and network bandwidth usage.

How quickly does a Anyware agent complete a connection?

Anyware agents can usually achieve a connection in 15 to 30 seconds. We use the statistical value Top Percentile (TP) to measure the time to establish a session:

- TP99: Ninety-nine percent of connections complete in under 30 seconds.
- TP50: Fifty percent of connections complete in under 15 seconds.

What do I need to know about power management?

Hosts with Windows power management enabled may drop PCoIP connections when turning off displays or going to sleep. If this behavior is undesirable, these Windows power management features should be turned off.

To disable Windows power management features:

1. From the Windows Control Panel, open **Power Options**.
2. Click **Change plan settings** next to the enabled power plan.
3. Select **Never** from the drop-down list for *Turn off the display*
4. Select **Never** in the drop-down list for *Put the computer to sleep*.
5. Click **Save changes**.

Why is my application not sending audio?

The Anyware agent delivers audio over PCoIP connections by reassigning the system's default audio device. Only applications that use the system default audio device will send or receive audio over

PCoIP; applications that are configured to use non-default devices will not work. If you don't hear audio from your application, make sure it is configured to use the system default audio device.

I'm using Anyware Cloud Licensing. What network blocks should I leave open?

If you are using Anyware Cloud Licensing, you will need to add the following to your allowlist:

- `teradici.flexnetoperations.com`
- `teradici.compliance.flexnetoperations.com`

If you use an IP-based allowlist, we recommend your IT team add the following network blocks to your allowlist:

- `IPv4: 185.146.155.64/27`
- `IPv6: 2620:122:f005::/56`

Important: Migrating from the previous specification

Previously, our allowlist specification looked like this:

- **Production**: `64.14.29.0/24`
- **Disaster Recovery**: `64.27.162.0/24`

If you have an existing implementation using an IP-based allowlist like this, we recommend you leave it in place until the new allowlist is active and tested.