

# PCoIP<sup>®</sup> Host Software for Linux User Guide

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2	May 18, 2012	Updated for release 3.0.6
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## Definitions

AWI	Administrative Web Interface. The AWI contains a set of webpages that let you configure the PCoIP host or PCoIP zero client through a web browser.
Daemon	A program that runs as a background process waiting to be activated by an event or condition.
FPS	Frames per Second
IT	Information Technology
LAN	Local Area Network
NIC	Network Interface Card
OSD	On Screen Display
PCI	Peripheral Component Interconnect
PCoIP®	Personal Computer over Internet Protocol (PC-over-IP®)
PCoIP Host	Host or server side of PC-over-IP system.
PCoIP Zero Client	Desktop portal or integrated display based on a PCoIP hardware device.
RPM	RPM Package Manager (package management system used to install/uninstall the PCoIP host software for Linux).
SLED11	SUSE Linux Enterprise Desktop 11
Soft Client	Software application that can establish a PCoIP session with a PCoIP host.
Tera1	First-generation family of Teradici processors for PCoIP zero clients and host cards.
Tera2	Second -generation family of Teradici processors for PCoIP zero clients and host cards.
TwinView	A feature supported on Nvidia graphics cards that present two displays as one large virtual display.
UI	User Interface
Xinerama	An X Window extension that presents two or more displays as one large virtual display.



# 1 Introduction

The PCoIP host software for Linux is a collection of drivers and applications that lets Linux operating systems (OS) interact with Teradici Tera1 and Tera2 PCoIP host processors installed in the host PC/workstation and a PCoIP client connected to the host. This lets users enable features such as the following:

- Using local cursor and keyboard
- Locking the host PC when a session is terminated
- Disconnecting a session
- Viewing host statistics and connection information
- Adjusting the PCoIP session image quality preference setting

This document provides guidelines for installing or uninstalling, using, and troubleshooting the PCoIP host software for Linux.

**Note:** See section 2.3 for details on the Linux distributions on which the PCoIP host software was tested.

**Note:** PCoIP host software release 4.1.6 for Linux added experimental support for Teradici PCoIP softsoftware clients connecting to PCoIP host cards. Section 2.2 lists some restrictions soft client users should note.

## 1.1 Audience

This document is written for the following audience:

- Network administrators who want to install and configure the host software
- PC users who want to configure the host software

## 2 PCoIP Host Software

PCoIP host cards loaded with firmware releases 3.1.0 or later support an optional feature, the PCoIP Host Driver Function. This feature lets administrators use a PCoIP software package on the host PC or workstation. This software package works with the exposed PCoIP Host Driver Function PCI device function. If you, the administrator, install the PCoIP host software package on the PC or workstation, users can manage and use the features of the PCoIP Host Driver Function.

The user application, called the host software user interface (UI), or UI, is installed when the host software is installed. The UI communicates with the PCoIP firmware via the device drivers installed by the PCoIP host software. You can configure the features of the PCoIP host software through the UI.

Release 4.1.6 includes an additional software application called the host software daemon. By default the daemon is enabled and starts running when the workstation boots. The daemon is responsible for the following. See section 3.5.1 for details on configuring the daemon.

- Activates the **Local Cursor and Keyboard** feature for soft client sessions while the login screen is active
- Disables the **Local Cursor and Keyboard** feature for zero client sessions when a user logs off

The compatibility matrix in Table 2-1 lists the firmware releases and the compatible PCoIP host software releases. We recommend that you load the PCoIP host software release that corresponds to the firmware loaded on the PCoIP host card and zero client. The recommended firmware release column lists the firmware release used to test each host software release.

**Table 2-1: Firmware Compatibility Matrix**

Compatible Firmware Releases	Recommended Firmware Release	PCoIP Host Software Release for Linux
4.1.x	4.1.2	4.1.6
4.0.x	4.0.2 (Tera1), 4.0.3 (Tera2)	4.0.8
3.1.x, 3.2.x, 3.3.x, 3.5.x	3.5.1	3.0.6
Earlier than 3.1.0	Not available	Not available

Some features added to new releases of the host software require changes to the firmware running on the PCoIP host and/or zero client. Table 2-2 lists the features that require firmware changes. Each feature is available if the host card and zero client are running a firmware release that is equal to or later than the release listed in the table.

**Table 2-2: New Feature Software/Firmware Requirements**

New Feature Description	Host SW Release	Firmware Release
Experimental support for Teradici PCoIP software client	4.1.6	4.1.0
Support for Tera2xxx PCoIP host card	4.0.5	4.0.3
Support for configuring PCoIP session image quality setting (see section 5.6)	3.0.6	3.5.0

New Feature Description	Host SW Release	Firmware Release
Support for processing multimedia keys (USB HID usage pages 1 and 12) when the local cursor feature is enabled. Example keys include volume up, mute, and calculator.	3.0.6	3.3.0
Support for configuring client keyboard repeat detection (see section 5.2)	3.0.6	3.2.0
Support for IT auditing feature that gathers workstation and PCoIP host card network settings (see section 5).	3.0.6	3.5.0

Note: The Teradici PCoIP host software for Linux package is a source code package. This package is used to create a binary RPM that can then be installed. Section 2.3 lists the Linux distributions the package was tested with. The package might work on other Linux distributions, but Teradici makes no guarantees. Problems with the package should be reported to Teradici via the Teradici Support site (<http://techsupport.teradici.com>).

## 2.1 System Requirements

Before installing the PCoIP host software, ensure the PC or workstation meets the following requirements:

- PCoIP host and zero client are loaded with a compatible firmware release (see Table 2-1).
- Host Driver Function is enabled on the PCoIP host card (see Section 3.1).
- See section 2.3 for information on supported Linux distributions.

## 2.2 Soft Client Restrictions

PCoIP sessions between soft clients and PC/workstations with a PCoIP host card are now supported experimentally.

High-level requirements for these connections:

- PCoIP host card running firmware release 4.1.0 or later
- PCoIP host software for Linux release 4.1.6 or later
- Teradici PCoIP software client release 1.0.0 Beta or later
- The daemon must be enabled when the login screen is active, the host software UI must be running, and the **Enable Local Cursor and Keyboard** feature must be enabled when the session is active. If these conditions are not met, mouse and keyboard input from the soft client is not sent to the PC/workstation.

PCoIP host software imposes some limitations intended to prevent users from getting their system into a state where the keyboard and mouse do not work.

The restrictions are described in this document and summarized as:

- Users should not try to install the host software while connected to the PC/workstation from a soft client. See section 3.4 for details.
- Users cannot disable the local cursor feature while connected to the PC/workstation from a soft client

## 2.3 Tested Linux Distributions

Table 2-3 lists Linux distributions the host software was tested with at the time of writing this document. The host software may be compatible with additional distributions. Check the Teradici support site (<http://techsupport.teradici.com>) for the most recent information on supported Linux distributions.

**Table 2-3: Linux Distribution Compatibility Matrix**

Linux Distribution	Host SW Release	Tested by
CentOS 5.3, 64-bit (kernel 2.6.18-128), GNOME CentOS 6.4, 64-bit (kernel 2.6.32-358), GNOME/KDE SLED 11 SP 2 (kernel 3.0.13-0.27), GNOME/KDE	4.1.6	Teradici
CentOS 5.3, 64-bit (kernel 2.6.18-128), GNOME CentOS 6.2, 64-bit (kernel 2.6.32-220), GNOME/KDE CentOS 6.3, 64-bit (kernel 2.6.32-279), GNOME/KDE	4.0.8	Teradici
CentOS 5.3, 64-bit (kernel 2.6.18-128), GNOME CentOS 6.2, 64-bit (kernel 2.6.32-220), GNOME	4.0.5	Teradici
CentOS 5.3, 64-bit (kernel 2.6.18-128), GNOME CentOS 6.2, 64-bit (kernel 2.6.32-220), GNOME	3.0.6	Teradici
Fedora 13, 64-bit (kernel 2.6.34.9-69.fc13)	3.0.6	Customer

## 2.4 Release Notes

PCoIP host software releases are accompanied by release notes. See TER1104007 *PCoIP Host Software for Linux Release Notes* for the latest information on PCoIP host software features and known issues.

## 3 Installing PCoIP Host Software

This section describes the following:

- How to configure the PCoIP host card to work with the PCoIP host software
- How to set up a Linux workstation to build a binary RPM
- How to create a binary RPM
- How to install or upgrade the PCoIP host software
- How to configure the host software UI and daemon

We strongly recommend that you install the version of PCoIP host software that is released with the version of the firmware loaded on the PCoIP host and zero client. See Table 2-1 for more details. Before you install the software, you must also enable the Host Driver Function on the host card as described next.

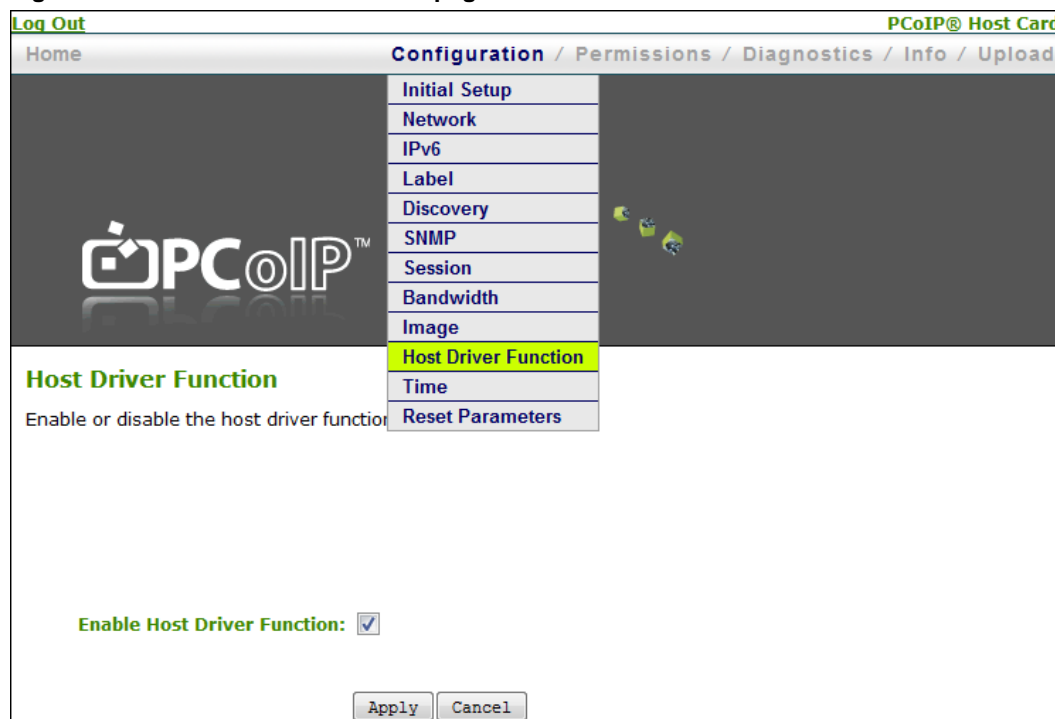
**Note:** Temporal dithering is a technique employed by some graphics cards to simulate colors that they cannot natively display by rapidly changing the colors of pixels, thus tricking the eye into seeing “in-between” colors. During PCoIP remote sessions, temporal dithering can cause extremely high bandwidth utilization because the rapidly changing pixels force the PCoIP protocol to constantly deliver large screen updates to the remote desktop. Temporal dithering should be disabled on workstation graphics cards supporting PCoIP sessions. Consult your graphics card documentation or contact the card vendor for details on disabling temporal dithering. The Knowledge Base on the Teradici Support site (<http://techsupport.teradici.com>) also contains information on disabling temporal dithering on some graphics card.

### 3.1 Enabling Host Driver Function

To enable the Host Driver Function on the PCoIP host:

1. Open a web browser on a PC or workstation connected to the same network as the PCoIP host. Browse to the PCoIP host's webpage, and then log in.
2. From the **Configuration** menu, select **Host Driver Function**.

Figure 3-1: Host Driver Function Webpage



3. Check the **Enable Host Driver Function** box, and then click **Apply**. A prompt appears to indicate the host PCoIP processor must be reset.
4. Click **Reset**, and then click **OK** to schedule a deferred reset.
5. Restart the PCoIP host by restarting the PC or workstation.
6. After the workstations boots, log into the PC or workstation as usual.

## 3.2 Setting up a Development System

The host software is installed using a binary RPM. The RPM includes a kernel driver. Kernel drivers must be built using header files that match the version of the kernel running on the workstation the host software is installed on. This restriction prevents Teradici from distributing pre-built RPMs. The package provided by Teradici allows end users to create the binary RPM.

This section describes the steps to follow to set up a Linux system to create the PCoIP host software binary RPM. This document was written for a Linux system running CentOS 6.4. The same instructions may apply to other Linux distributions, but may require changes.

### 3.2.1 Requirements

- CentOS 6.4 or other supported Linux distribution installed
- Gnome or KDE desktop environment installed
- Root permissions

## 3.2.2 Install the Required Tools/Libraries

To create the binary RPM the packages listed in Table 3-1 must be installed. The packages differ based on the Linux distributions running on the workstation. Install the packages listed in the column that match the Linux distribution running on the workstation.

**Table 3-1: Required Packages**

	Packages required for different Linux distributions	
Description	CentOS, Red Hat	SLED
Compiler	gcc	gcc
Kernel header files required to build kernel driver	kernel-devel	kernel-default-devel
Tools used to build RPM files	rpm-build	Not required

To install these packages on CentOS or Red Hat:

1. Log in as root.
2. Open a console.
3. yum install <package name>

To install these packages on SLED:

1. Log in as root.
2. Open a console.
3. zypper install <package name>

**Note:** If the kernel-devel or kernel-default-devel package must be installed, be careful to install the version compatible with the kernel installed on the workstation. If the wrong version is installed, the driver will fail to build and the error message “**install: cannot start `pcoip\_host.ko': No such file or directory**” will appear while installing the RPM file created by the createRPM script.

## 3.3 Building a Binary RPM

This section describes how to create a binary RPM from the source code package.

### 3.3.1 Requirements

- Linux development system set up for PCoIP host software development (see section 3.2)
- Copy of the PCoIP host software source code for Linux

### 3.3.2 Unpack the Source Code Package

To unpack the source code package:

1. Obtain the PCoIP host software package for Linux from the Teradici support site (<http://techsupport.teradici.com>). The package includes multiple files, including a copy of this document and an archive file (pcoip\_host-X.Y-Z.tar.bz2). The archive contains the files necessary to create a binary RPM.
2. Copy the archive file to the Linux workstation and create a new folder somewhere on the file system (for example, PCoIP\_Host\_SW\_Release).
3. Extract the contents from the provided archive to the newly created directory.

Note: The package/kernel/linux/scripts directory contains the disable\_lcur.sh script, which disables the local cursor feature. Administrators may want to run this script when users log out. This ensures the local cursor feature is not enabled while the host SW UI is not running. The daemon also disables the local cursor when a user logs out. This script should only be run if the daemon has been disabled.

### 3.3.3 Create a Binary RPM

To create a Binary RPM:

1. Open a console and set the working directory to package/kernel/linux/scripts.
2. Log in as root. This is necessary when creating RPMs distributed outside of a company. When an RPM is created, the userid of the person creating the RPM is the owner of the files in the RPM. Warning messages appear if an RPM is installed on systems that do not recognize the userid associated with the files. Creating the RPM as root avoids this warning.
3. The createRPM script assumes the root RPM build directory tree exists. On CentOS 5 the base directory is /usr/src/redhat. On CentOS 6 the base directory is /root/rpmbuild. On SLED the base directory is /usr/src/packages. If the directory tree does not exist, enter one of the following commands to create it.

```
mkdir -p /usr/src/redhat/{BUILD,RPMS,SOURCES,SPECS,SRPMS}
mkdir -p /root/rpmbuild/{BUILD,RPMS,SOURCES,SPECS,SRPMS}
mkdir -p /usr/src/packages/{BUILD,RPMS,SOURCES,SPECS,SRPMS}
```

4. Execute the createRPM script by entering the command `./createRPM`. The binary rpm is written to the package/kernel/linux/obj directory.

## 3.4 Installing PCoIP Host Software Binary RPM

This section describes how to install the binary RPM created from the source code package.

Note: Before installing the PCoIP host software, ensure no other copies of the software are installed by checking if the file `pcoip_agent` exists in the `/usr/bin` directory. If this file exists, remove it by following the instructions in section 4.1.

Note: PCoIP host software release 4.1.6 added experimental support for Teradici PCoIP softsoftware clients. As an administrator, you cannot run the host software installer while connected to a host system using a soft client. The local cursor feature is disabled during the installation process, which disables the user's keyboard and mouse. This prevents the user from completing the installation process.

To install the software:

1. Open a console and set the working directory to package/kernel/linux/obj.



2. Log in as root and enter the following command at a shell prompt.

```
rpm -ivh pcoip_host-4.1-6.el6.x86_64.rpm
```

This installs the following files:

`/usr/bin/pcoip_agent`: This is the GUI that configures the PCoIP kernel driver. The UI accepts multiple command line options. See section 5.1.1 for a description of the supported options.

`/usr/bin/pcoiphostswd`: This is the host software daemon. See section 2 for a description of what the daemon does. Users wishing to establish a PCoIP session with a workstation from a soft client must not disable the daemon.

`/usr/bin/pcoip_lockscreen`: The GUI calls this script when locking the screen after a PCoIP session is disconnected. This script has been tested on systems running KDE3, KDE4 and Gnome. Verify this script works if the host software fails to lock the screen when a PCoIP session is disconnected.

**Note:** The `pcoip_agent` and `pcoip_lockscreen` files are written to the `/usr/bin` directory when the host software is installed. Users wishing to move these files to a different location, such as a network drive, must move both files to the same directory. When the `pcoip_agent` begins execution it searches for the `pcoip_lockscreen` script in the `/usr/bin` directory. If the script is not found the `pcoip_agent` then looks in the directory the `pcoip_agent` is stored in.

**Note:** If the `pcoip_agent` and `pcoip_lockscreen` files are moved and a new version of the host software is installed the administrator must be sure to remove the old copies of these files and replace them with the new files found in the `/usr/bin` directory.

`/usr/bin/pcoip_starhostsw`: This script starts the host software executable (`pcoip_agent`). Administrators are recommended to use this script to launch the host software executable when users log in. The script accepts multiple command line options. See section 5.1.2 for a description of the supported options.

`/lib/modules/<kernel_version>/kernel/drivers/input/misc/pcoip_host.ko`: This is a kernel driver that communicates with the PCoIP host card.

`/etc/init.d/pcoip_host`: This is a script that executes when the system boots. Links to the script are found in the `/etc/rcx.d` directories where `x` is  $\geq 0$  and less than or equal to 6. This script handles starting and stopping the `pcoip_host` driver.

`/etc/init.d/pcoip_hostcheck`: This is a script that executes when the system boots. Links to the script are found in the `/etc/rcx.d` directories where `x` is  $\geq 0$  and less than or equal to 6. This script checks for the `pcoip_host` kernel module and builds it if it doesn't exist.

`/etc/udev/rules.d/10-pcoip_host_udev.rules`: This file creates a special character file in the `/dev` directory used by the UI to control the driver.

3. Some Linux distributions require additional changes to the X Windows configuration file `/etc/X11/xorg.conf`. These changes are not required on CentOS 6.x, but they are required on CentOS 5.x, SLED 11 and Fedora 13. The changes ensure the X Windows evdev input driver processes the data received from the PCoIP mouse device driver.

Add the following line to the ServerLayout section:

```
InputDevice    "PCoIPMouse" "SendCoreEvents"
```

Create the following new InputDevice section:

```
Section "InputDevice"
    Identifier    "PCoIPMouse"
    Driver        "evdev"
    Option        "Device" "/dev/input/pcoip_mouse"
    Option        "Mode" "Absolute"
EndSection
```

4. Restart the system.
5. After the system boots, log in and start the UI by executing the following command from a terminal.

```
pcoip_starthostsw
```

**Note:** You must run the UI from the context of a user other than root. If you start the UI from the root account, an error message appears and the UI closes. Some command line options, such as the `-info` option, can be specified when the UI is run from the context of the root user.

**Note:** Administrators should configure each workstation to automatically start the UI when a user logs in. To do this for CentOS 5 systems running GNOME, select the **Start Programs** tab on the **System->Preferences->More Preferences->Sessions** program, and then add the startup script (`/usr/bin/pcoip_starthostsw`) plus any optional settings. If the UI icon appears on the desktop instead of the system tray, delay starting the UI by 10 seconds by including the `"-w 10"` option.

## 3.5 Configuration Files

This section describes the host software configuration files. Both the daemon and the UI allow the administrator to customize their operation.

### 3.5.1 Host Software Daemon Configuration File

When the host software daemon starts, it attempts to read configuration settings from the file `/etc/pcopiphostswd.conf`. If the file does not exist or a setting is not found in the file, the daemon uses a default value.

A copy of the configuration file is included with the host software in the `package/kernel/linux/scripts` directory. Administrators wishing to modify the default daemon configuration settings should copy this file to the `/etc` directory, modify it and restart the workstation.

The daemon supports the following settings.

#### Daemon Enable

- Field name: `DaemonEnable`
- This field determines whether the daemon is enabled. The daemon must be enabled in systems that require the host SW to be running while the login screen is active. Soft clients send keyboard and mouse data to the host via the host SW. Users wishing to log into a host using a soft client must enable the daemon.

- Supported values: 0, 1 (0=disable, 1=enable)
- Default value: 1

#### Daemon log filename

- Field name: DaemonLogFile
- This field is a string that determines the path and filename of the log file the daemon writes log messages to.
- Default value: /var/log/pcoiphostswd.log

#### Logging level

- Field Name: DaemonLogLevel
- This field controls the verbosity level of the daemon. As the level increases the daemon generates more log messages. Typically users should set this field equal to info or error, which will generate error messages and informational messages when the daemon starts and stops the host SW.
- Supported values: 0=None, 1=Critical, 2=Error, 3=Info, 4=Debug
- Default value: 3 (Info)

#### Daemon start delay

- Field name: DaemonStartDelay
- When the system boots the pcoip\_host script starts pcoiphostswd, which launches a daemon process. When the daemon starts it delays this many seconds before entering an infinite loop in which it does its processing.
- Supported values: positive integer (1, 2, 3, ...)
- Default value: 1

## 3.5.2 Host Software Configuration Files

When the host software UI executable (pcoip\_agent) starts, it reads configuration settings from two files; a local file and a global file. The local file is stored in ~/.pcoip\_agent and the global file is stored in /etc/pcoiphostswglobal.conf. The default name and location of the local and global files can be overridden by including the optional parameters “-lc=</path/filename>” and “-gc=</path/filename>” when starting the UI executable.

When the UI starts, it attempts to open the local configuration file and read settings from it. If the local file does not exist or a setting is not defined in the local file, the UI attempts to read the setting from the global configuration file. If the global configuration file does not exist or the setting is not defined in the file, the UI uses a default value.

While the UI runs it creates the local file if one does not exist and stores settings in it. This allows users to customize the configuration settings. This also allows administrators to configure the host software default settings for first time users.

A sample global configuration file is provided with the host software in package/kernel/linux/scripts/pcoiphostswglobal.conf. Administrators wishing to use this feature should store a copy of the file in the /etc directory. Users wishing to store the file somewhere else must include the “-gc” option when starting the host software. Entering either of the commands below starts the host software and uses the global configuration file /tmp/hostswglob.conf.

```
pcoip_starthostsw -o “-gc=/tmp/hostswglob.conf”
pcoip_agent -gc=/tmp/hostswglob.conf
```



## 4 Uninstalling PCoIP Host Software

You can easily remove the PCoIP host software from the PC or workstation at any time. If you no longer need the software, you should also disable the Host Driver Function in firmware. See section 4.2 for details.

### 4.1 Uninstalling the PCoIP Host Software for Linux

To uninstall the PCoIP host software for Linux:

1. Log in as root, and then at a shell prompt enter:

```
rpm -e pcoip_host
```

**Note:** The above step removes the installed PCoIP host software, but does not remove any PCoIP host software that might be running. Reboot the workstation to ensure the PCoIP host software is no longer running.

### 4.2 Disabling Host Driver Function

Disabling the PCoIP Host Driver Function on the PCoIP host prevents Linux from seeing an unknown PCI Device.

To disable the Host Driver Function on the PCoIP host:

1. Open a web browser on a PC or workstation connected to the same network as the PCoIP host.
2. Browse to the PCoIP host webpage, and then log in.
3. From the **Configuration** menu, select **Host Driver Function**. The webpage is shown in Figure 3-1.
4. Uncheck the **Enable Host Driver Function** box, and then click **Apply**. This generates a prompt that indicates you must reset the host PCoIP processor. Click **Reset**, and then **OK** to schedule a deferred reset.
5. Restart the PCoIP host by restarting the PC or workstation.

## 5 Using the PCoIP UI


The UI executable (/usr/bin/pcoip\_agent) is accessible after installing the PCoIP host software package. The administrator must configure the system to start the executable when a user logs into the workstation. Refer to step 5 in section 3.4 for additional details. When the UI is running, the  icon appears in the system tray as shown in Figure 5-1.

Figure 5-1: System Tray with PCoIP UI Icon




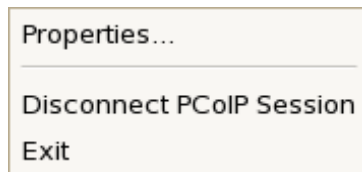
**Note:** Sometimes a vertical bar appears in the system tray instead of the  icon. The host software functions properly but the UI is difficult to access. To work around this problem, exit and restart the host software or modify the wait delay if using `pcoip_starthostsw -w <delay>` to start the host software.

Figure 5-2 displays the menu that appears after right-clicking the icon in the system tray. To open a new window, select **Properties...** from the right-click menu or double-click the icon in the system tray. This window has multiple tabs that let users access different features. Each feature is described in sections 5.2 through 5.7.

Figure 5-2: PCoIP UI Right-Click System Tray Menu



To disconnect the PCoIP session (if one is active), select **Disconnect PCoIP Session**.

To end the UI executable, select **Exit** from the right-click menu. The local cursor feature is disabled when the UI terminates.

### 5.1 Command Line Options

The UI can be started from a terminal or a script by entering the `pcoip_starthostsw` or `pcoip_agent` commands. Users are recommended to use the `pcoip_starthostsw` command because it allows them to enter all options supported by the `pcoip_agent` command plus additional options supported by `pcoip_starthostsw`.

This section describes the options supported by `pcoip_starthostsw` and `pcoip_agent`.

#### 5.1.1 pcoip\_agent Options

The `pcoip_agent` command supports the following command line options:

- To list all supported command line options, enter `pcoip_agent -h`.
- To disconnect a session, enter `pcoip_agent -disconnect`. This method is useful for making a disconnect-session shortcut, or mapping to a 'Favorite' key on some keyboards.

- To disable the local cursor feature, enter `pcoip_agent -disable_lcur`.

**Note:** This should only be used to disable the local cursor feature when a user logs off. If this command is executed while the local cursor is enabled and the **Visible Cursor(s)** option equals **Local**, the local cursor will be disabled and the remote cursor will be hidden. The host software daemon added to release 4.1.6 disables the local cursor feature when a user logs off while connected to the workstation using a zero client. If the daemon is enabled, administrators should not run `pcoip_agent -disable_lcur` when users log off.

- The UI IT auditing feature writes information about the workstation and PCoIP host card to the command line. To invoke this feature, enter `pcoip_agent -info`. The following is an example of the output:

```
Host Name: localhost.localdomain
Host IP: 192.168.0.13
Host MAC: 00-2b-68-33-11-28
PCoIP Host SW Version: 3.0.2
PCoIP Host SW Build Date: Apr 18 2012 17:04:42
PCoIP Host card MAC: 00-30-04-0D-61-26
PCoIP Host card IP: 192.168.99.21
```

- To disable the **Disconnect** and **Exit** options on the right-click system tray menu, enter `pcoip_agent -dde`. This feature is included to prevent users from accidentally disconnecting sessions or closing the `pcoip_agent` executable while trying to access the GUI.
- The “-ll” option is used to set the logging level of the UI. The supported logging levels are 0=**none** (default), 1=**critical**, 2=**error**, 3=**info** and 4=**debug**. To set the logging level equal to **debug** enter the following command:

```
pcoip_agent -ll=4
```

- TwinView** is a video mode supported by Nvidia graphics cards on multi-monitor workstations. The host software checks if this mode is enabled using the `nvidia-settings` utility. If **TwinView** is enabled on a workstation and the `nvidia-settings` utility is not installed or the utility does not support querying the **TwinView** option, users must include the “-t” option when starting the `pcoip_agent` executable. To override the host software code that checks if **TwinView** is enabled and disable **TwinView**, include the “-dt” option.

**Note:** Some multi-monitor workstations using newer versions of the Nvidia driver with **Xinerama** enabled must include the “-t” option when starting the `pcoip_agent`. If the remote and local cursors are not in sync after starting the `pcoip_agent`, try restarting `pcoip_agent` with the “-t” option.

- Host software release 4.0.3 and later include support for the **remote cursor synchronization** feature which periodically compares the position of the remote and local cursors. The local cursor position is updated when the remote cursor is moved by something other than the local cursor, which may be an application running on the host or a bridged USB tablet. To disable this feature, include the “-drcs” option when starting the `pcoip_agent` executable.
- When the **remote cursor synchronization** feature is enabled, the host software sends updates to the client every 250 ms when the host cursor moves. The period of these reports can be changed by specifying the “-rcsp=10” option, which configures the host software to send reports every 10 ms.

**Note:** Zero client users that set **Visible Cursor(s)** equal to **Local** and bridge USB

devices that change the position of the cursor should use this setting to reduce the time between updates from 250 to 10 to avoid choppy cursor movement.

- The command line options “-gc=<fully qualified filename>” and “-lc=<fully qualified filename>” can be used to specify a global configuration file and local configuration file. See section 3.5.2 for details on using these options.

## 5.1.2 pcoip\_starthostsw Options

The `pcoip_starthostsw` command supports the following command line options:

- To list all supported command line options, enter `pcoip_agent -h`.
- To set the value of the `DISPLAY` environment variable equal to `:4.0` when it isn't initialized enter `pcoip_starthostsw -d ":4.0"`. This option should not be used under normal operation and the option is ignored if the `DISPLAY` environment variable is already defined.
- By default the `pcoip_starthostsw` script starts the UI (`pcoip_agent`) executable found in the user's search path. To specify the path and filename of the UI enter the following command:

```
pcoip_starthostsw -e /public/bin/pcoip_agent.
```

- Use the “-o” option to specify options to be passed to the `pcoip_agent` program. Enter the following command to start the UI with **remote cursor synchronization** disabled and **debug** logging enabled.

```
pcoip_starthostsw -o "-drcs -ll=4"
```

- To start the UI and direct all log messages to a file, enter the following command:

```
pcoip_starthostsw -l /tmp/pcoip_ui.log -o "-ll=4"
```

- The “-w” option can be used to delay the start of the UI. Step 5 in section 3.4 mentions administrators should configure workstations to automatically start the UI when a user logs in. If the UI starts before the system taskbar is running, the UI icon appears on the desktop instead of the taskbar. To avoid this problem the start of the UI should be delayed. Enter the following command to delay the start of the UI by 10 seconds.

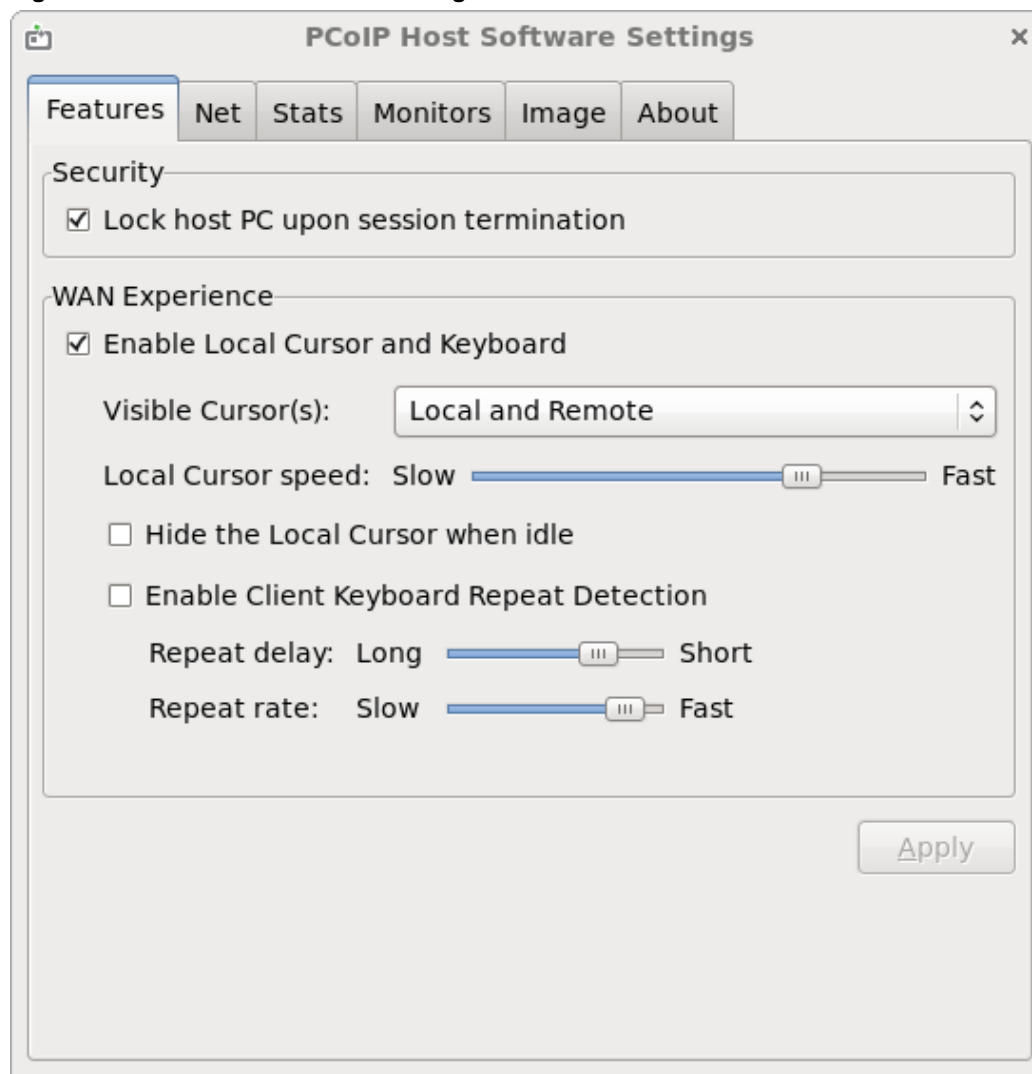
```
pcoip_starthostsw -w 10
```

## 5.2 Features

The following figure show the **Features** tab of the UI.



Figure 5-3: PCoIP Host Software Settings – Features



Users can configure the following options.

## Security

The **Security** feature lets you lock the PC or workstation to ensure other users do not log into another user's session when the user disconnects from a PCoIP session.

- **Lock host PC upon session termination:** Select this option to lock the Host PC when a PCoIP session is disconnected.

**Note:** The host software calls the `pcoip_lockscreen` script to lock the screen. Verify this script works if the host software fails to lock the screen when a PCoIP session is disconnected. See section 3.4 for details on the location of the script.

## WAN Experience

The WAN Experience local cursor and keyboard features may be useful in WAN deployments where network latency exceeds 40-60 ms. In these environments, users may notice a visible lag between the movement of the mouse and the movement of the cursor. Key presses may be dropped or falsely repeated key presses may occur under very high network latency scenarios. Both of these side effects of high-network latency

hinder user experience. The local cursor and keyboard features help lessen latency effects.

Latency effects are noticed differently by users. With network latency less than 40 ms, most users notice the local cursor overlay and desktop cursor moving in tandem. With higher network latencies, the local cursor overlay moves according to the user's movements, and the desktop cursor follows with visible lag. Because the overlay provides instantaneous feedback, the user can move the mouse freely without having to wait for the desktop cursor to catch up.

- **Enable Local Cursor and Keyboard:** The local cursor is enabled when this option is selected and the mouse device's movements are recorded at the client. The movement is reflected via the local cursor overlay in real time. The movements and mouse clicks are sent to the PCoIP host and then to a driver via the exposed PCoIP Host Function PCI device and device drivers. When the driver receives the movement information, the cursor on the workstation is updated.

The local keyboard feature works on a similar concept. The client captures and records keyboard key presses, and then sends them to the PCoIP host. This feature prevents key presses from being dropped. The local keyboard feature does not display an overlay for the typed text, and the text that appears on the screen is affected by the network latency.

Note: The **Enable Local Cursor and Keyboard** option may be grayed out if not supported. When this happens, a "[Why is this unavailable?](#)" link appears on the **UI Features** tab. Move the mouse over the link to see a tooltip explaining how to fix the problem.

- **Visible Cursor(s):** The available options are as follows:
  - **Remote:** cursor shape drawn by the workstation/host
  - **Local:** cursor shape drawn by the client
  - **Local and Remote**

Note: When the local cursor feature is enabled and the **Visible Cursor(s)** option is set to **Local**, the remote cursor is hidden. See section 6.3 for details on known problems that may occur when hiding the remote cursor.

Note: When the **Remote** visible cursor is selected, the user is prevented from using the **Hide the Local Cursor when idle** feature.

Note: The local cursor overlay icon appears as an arrow with an "L" in it when the **Local** cursor is visible and the host software cannot display the correct host drawn cursor. See section 6.3 for additional details.

- **Cursor speed:** Sets the speed of the local cursor overlay. The local cursor speed setting is separate from the mouse speed in Linux.

Note: You can also configure the zero client cursor speed through the PCoIP On Screen Display (OSD). See the TER1206003 *PCoIP Zero Client and Host Administrator Guide*.

- **Hide the Local Cursor when idle:** Check this box to have the local cursor overlay disappear after one second of idle mouse movement. Uncheck this box to always have the local cursor overlay shown.

Note: The PCoIP host software stores separate copies of the **WAN Experience** configuration settings for each client a user connects to a host from. This lets users enable the feature on certain clients and disable it on other clients. This is useful

when a user connects to a host from a client at work over a LAN connection and another client at home over a WAN connection. In this scenario the user will likely disable the **Local Cursor and Keyboard** feature for the work client and enable the feature for the home client.

- **Enable Client Keyboard Repeat Detection:** Check this box to have the client perform keyboard repeat detection. Uncheck this box to have the host OS perform keyboard repeat detection.

Note: Enable this feature if the latency of the connection exceeds ~150 ms. When this feature is disabled, the host OS performs keyboard repeat detection. The host OS may incorrectly report repeated keys for high-latency connections.

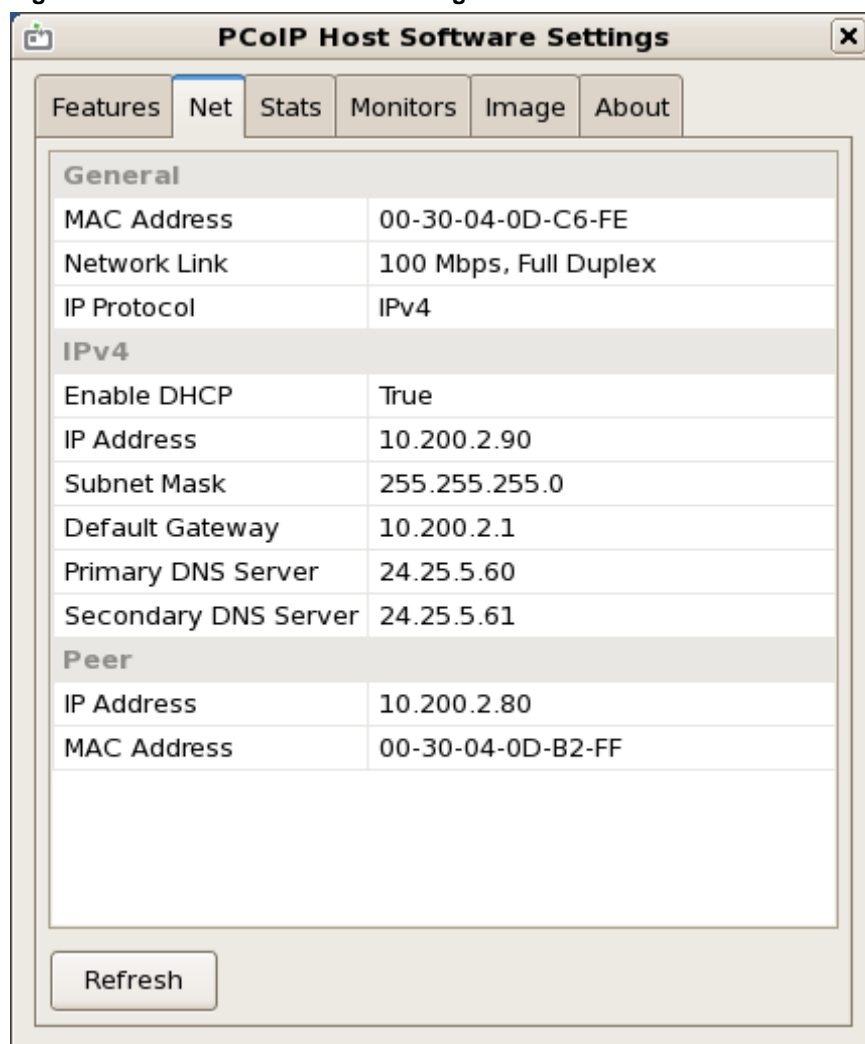
- **Repeat delay:** Set the amount of time that elapses before a character begins to repeat when you hold down a key. This setting is only used when the client performs keyboard repeat detection.
- **Repeat rate:** Set the speed at which a character repeats when you hold down a key. This setting is only used when the client performs keyboard repeat detection.

Note: You can also configure the zero client **Repeat delay** and **Repeat rate** through the OSD. See the TER1206003 *PCoIP Zero Client and Host Administrator Guide*.

## 5.3 Network

The following figure shows the **Net** tab of the UI. This tab lets you view the network settings of the PCoIP host.

Figure 5-4: PCoIP Host Software Settings – Net



The screenshot shows the 'PCoIP Host Software Settings' window with the 'Net' tab selected. The window contains two tables: 'General' and 'Peer'. The 'General' table shows host network information, and the 'Peer' table shows information about the connected client.

General	
MAC Address	00-30-04-0D-C6-FE
Network Link	100 Mbps, Full Duplex
IP Protocol	IPv4

IPv4	
Enable DHCP	True
IP Address	10.200.2.90
Subnet Mask	255.255.255.0
Default Gateway	10.200.2.1
Primary DNS Server	24.25.5.60
Secondary DNS Server	24.25.5.61

Peer	
IP Address	10.200.2.80
MAC Address	00-30-04-0D-B2-FF

Refresh

The **Net** tab shows the current network information for the host. This tab also reports status information on the NIC of the PCoIP host (speed, duplex setting, and link state – up/down). It also displays the IP and MAC addresses of the client connected to the host under the **Peer** settings.

- **Refresh:** Click this button to get the most up-to-date network settings of the host.

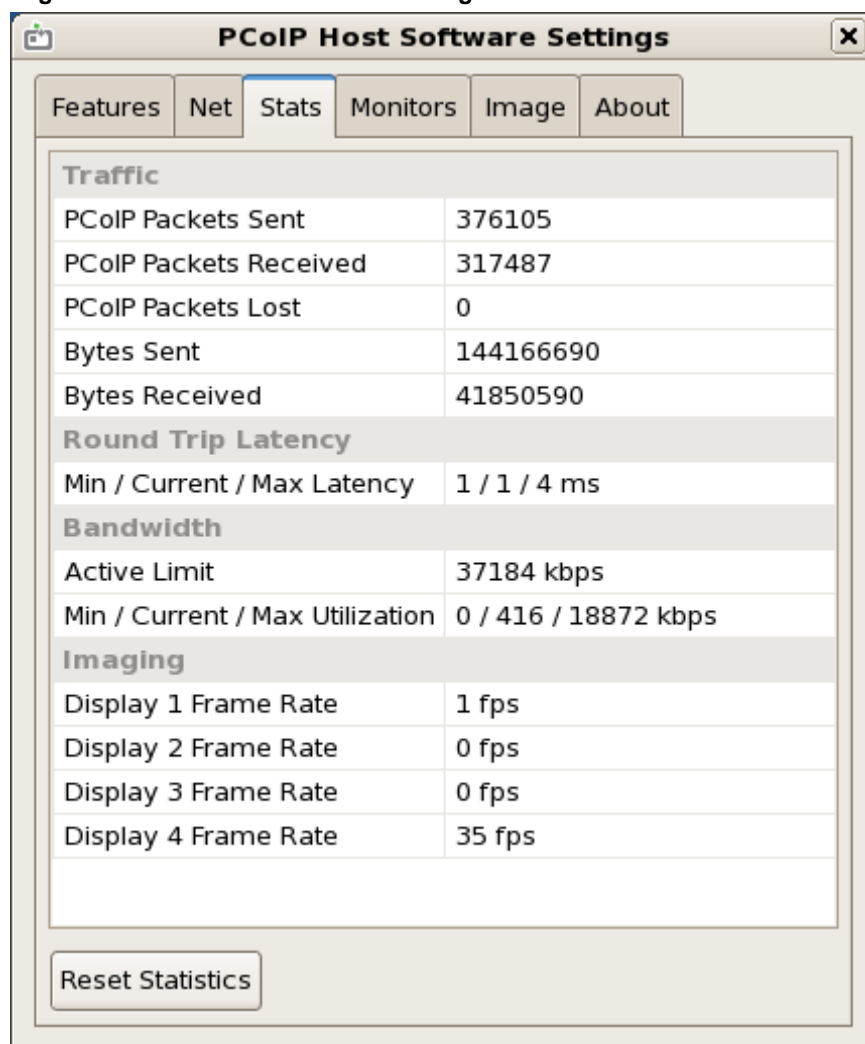
**Note:** The UI does not support changing the host card network settings. You can configure the network settings through the PCoIP Management Console (see the TER0812002 *PCoIP Management Console User Manual*), the PCoIP Administrative Interface (see the TER1206003 *PCoIP Zero Client and Host Administrator Guide*), or a connection broker.

## 5.4 Statistics

The following figure shows the UI **Stats** tab. This lets you view the PCoIP host session statistics.

**Note:** You can also access the PCoIP host card statistics through the PCoIP Administrative Interface (see the TER1206003 *PCoIP Zero Client and Host Administrator Guide*).

Figure 5-5: PCoIP Host Software Settings – Stats



Users can view the following PCoIP host statistics.

## Traffic

The **Traffic** statistics show the number of packets sent and received by the PCoIP host.

- **PCoIP Packets Sent:** Total number of PCoIP packets sent by the host.
- **PCoIP Packets Received:** Total number of PCoIP packets received by the host.
- **PCoIP Packets Lost:** Total number of PCoIP packets that were not received by the host.
- **Bytes Sent:** Total number of bytes sent by the host.
- **Bytes Received:** Total number of bytes received by the host.

## Round Trip Latency

The **Round Trip Latency** statistics report the total roundtrip PCoIP system (for example, host to client, and back to host) and network latency in milliseconds (+/- 1 ms). The UI reports the minimum, current, and maximum values.

## Bandwidth

The **Bandwidth** statistics show the host's active bandwidth settings.

- **Active Limit:** The maximum amount of network traffic the PCoIP host may currently generate. The value is derived from the host's configured bandwidth settings (see the TER1206003 *PCoIP Zero Client and Host Administrator Guide*) and the current network congestion levels.
- **Min / Current / Max Utilization:** The minimum, current, and maximum amount of traffic generated by the PCoIP host at a particular moment in time.

## Imaging

The **Imaging** statistics show frame-rate information for the displays connected to the client.

- **Display X Frame Rate:** The frame rate of Display X. The statistic is reported in frames per second (fps).

## 5.5 Monitors

The **Monitors** tab lets you match the monitors reported by the client with the screens reported by X Windows. If the monitor configuration settings are not properly set, the **Local Cursor and Keyboard** feature may be grayed out (disabled), or the local and remote cursors may not be in sync.

Figure 5-6 is a screenshot of the **Monitors** tab from a system with two X Windows screens and two monitors. The user must specify which monitor is connected to screen 1 and screen 2. To do this, click the **<select monitor>** text and choose **Monitor 1** or **Monitor 2**. Figure 5-7 shows the **Monitors** tab after the monitors are configured.


Figure 5-8 shows the zero client OSD **User Settings->Display Topology** page.

- The **Enable Configuration** checkbox must be checked. This setting is enabled by default. The monitor information shown at the bottom of Figure 5-6 and Figure 5-7 is not populated when the checkbox is clear and the **Local Cursor and Keyboard** feature is grayed out.
- The **Resolution** setting must match the resolution of the host monitor. The default value of this field is **Native**. The **Local Cursor and Keyboard** feature might be grayed out if this setting does not match the resolution of the host screen.
- The settings **Display Layout**, **Alignment**, **Primary**, **Position** and **Rotation** are ignored by the host software.

**Note:** The user must configure the **Monitor** settings when more than one monitor is connected to the client or when X Windows reports more than one active screen. If X Windows reports only one active screen and only one monitor is connected to the client and the client Display Topology settings are configured properly, the UI automatically configures the monitor settings.

**Note:** See section 6.2 for more information on multi-monitor systems.

Figure 5-6: PCoIP Host Software Settings – Monitors not Configured


**PCoIP Host Software Settings**
×

Features
Net
Stats
**Monitors**
Image
About

Configure the client monitor for each X Window screen. Valid monitor configuration must be set before the Local Cursor and Keyboard feature can be enabled.


Select a unique monitor for each X Window screen

Screen 1 - 1920x1080 at (0, 0)	<select monitor>
Screen 2 - 1920x1080 at (1920, 0)	<select monitor>

	Name	Vendor ID	Product ID	Serial Number	Size
<b>Monitor 1</b>	HP LA2206	HWP	2947	CNC1140XB0	1920x1080
<b>Monitor 2</b>	HP LA2206	HWP	2947	CNC1140X8X	1920x1080

Apply

Figure 5-7: PCoIP Host Software Settings – Monitors Configured


**PCoIP Host Software Settings**
✕

Features

Net

Stats

Monitors

Image

About

Configure the client monitor for each X Window screen. Valid monitor configuration must be set before the Local Cursor and Keyboard feature can be enabled.

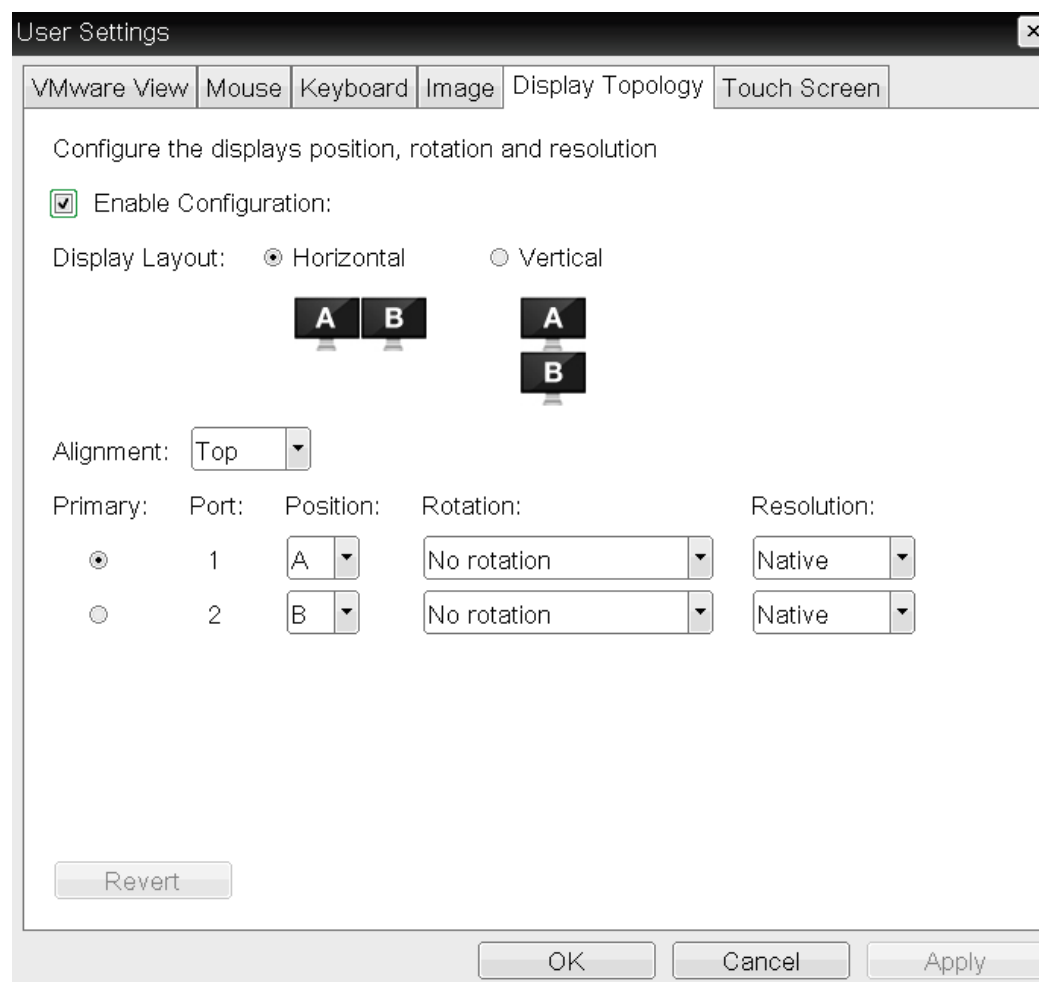
Select a unique monitor for each X Window screen

Screen 1 - 1920x1080 at (0, 0)	Monitor 2
Screen 2 - 1920x1080 at (1920, 0)	Monitor 1

	Name	Vendor ID	Product ID	Serial Number	Size
Monitor 1	HP LA2206	HWP	2947	CNC1140XB0	1920x1080
Monitor 2	HP LA2206	HWP	2947	CNC1140X8X	1920x1080

Apply

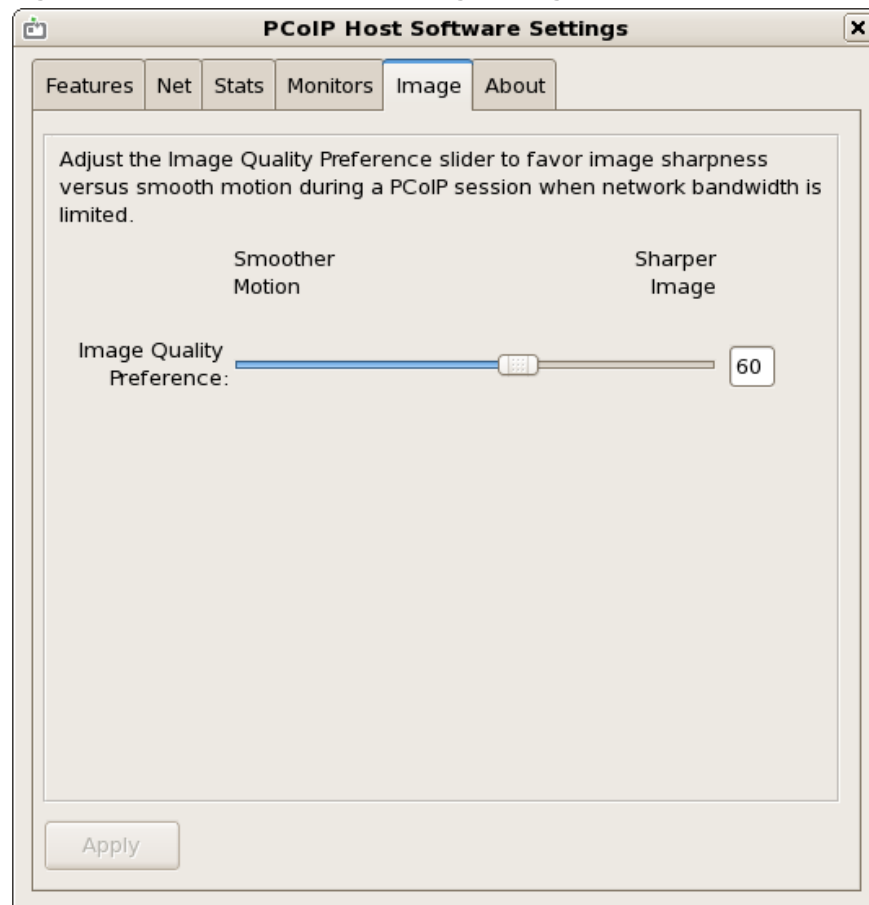


**Figure 5-8: OSD User Settings->Display Topology Options**

## 5.6 Image

The following figure shows the UI **Image** tab. This lets you view and adjust the PCoIP session image quality preference setting.

Figure 5-9: PCoIP Host Software Settings – Image



The PCoIP protocol adjusts image quality settings when the network connection between a PCoIP host and client is constrained and unable to provide enough bandwidth to support full frame rate video. The **Image Quality Preference** setting lets you configure a preference for smoother motion (higher frame rate) versus sharper image (higher image quality).

**Note:** Firmware release 3.5.0 is the first release that supports the image quality preference setting.

## 5.7 About

The **About** tab lets you view the version information of the PCoIP host software.

Figure 5-10: PCoIP Host Software Settings – About



## 6 Troubleshooting

This section outlines some common issues and suggested solutions.

### 6.1 Troubleshooting

Table 6-1 lists common issues and suggested solutions. If your problem is not described in this table, additional debug information can be captured by starting the host software executable with the optional parameter “-ll=4”, which enables debug logging.

**Table 6-1: Common Issues and Solutions**

Item	Description	Solution
1	The <code>pcoip_agent</code> application does not start.	Delete the lock file <code>/tmp/pcoiphostsw.pid</code> if it exists and start the UI application.
2	The local cursor overlay is out of sync with the remote cursor when the display is rotated by 90, 180, or 270 degrees.	The current PCoIP host software does not support local cursor on rotated displays.
3	Only the left, middle, right, forwards, and backwards buttons and horizontal scroll wheel work on the mouse when local cursor and keyboard is enabled.	The current PCoIP host software supports only the left, middle, right, forwards, and backwards mouse buttons and horizontal scroll wheel in local cursor mode.
4	A session is active with a soft client and the <b>local cursor and keyboard</b> feature is not enabled at the login screen after the host PC finishes booting.	By default, the host software daemon enables the <b>local cursor and keyboard</b> feature when the login screen is active and a session is active with a soft client.  <b>Resolution:</b> Verify the daemon configuration file ( <code>/etc/pcoiphostswd.conf</code> ) does not exist. If the file exists, verify the daemon is enabled.
5	A session is active with a zero client, the user logs off and two cursors are visible at the login screen.	When the host software daemon is active it disables the <b>local cursor and keyboard</b> feature when the login screen is active and a session is active with a zero client.  <b>Resolution:</b> Verify the daemon configuration file ( <code>/etc/pcoiphostswd.conf</code> ) does not exist. If the file exists, verify the daemon is enabled.
6	The local cursor speed is different from the X Windows cursor speed.	The local cursor does not use X Windows' pointer speed nor acceleration settings. The local cursor speed of the zero client is configured by the PCoIP UI. The local cursor speed of the soft client is controlled by soft client system's mouse driver.

Item	Description	Solution
7	The <b>Enable Local Cursor and Keyboard</b> checkbox is grayed out.	System configuration may not meet requirements. Refer to Section 6.2 for more information.
8	The PCoIP UI icon does not appear in the system tray. Instead it appears on the desktop, typically in the upper left hand corner of the screen.	This occurs when the PCoIP UI starts running before the desktop manager has finished booting.  <b>Resolution:</b> Delay starting the PCoIP UI. Refer to step 5 in section 3.4 for additional information.
9	The local cursor feature only works on systems where all active host displays are connected to a single client. This restriction exists because the client sends absolute cursor data to the host. For this to work properly the client topology must match the host topology. If the topologies do not match, the local and remote cursors will not be in sync.	<b>Resolution:</b> Ensure all active host displays are connected to a single client.
10	The PCoIP host software does not work in host systems with multiple PCoIP host cards.	The current PCoIP host software does not work in systems with more than one PCoIP host card.
11	Only one instance of the UI can run on the workstation.	Multi-user mode is not supported. Do not attempt to run multiple instances of the UI.
12	The pcoip_host.ko kernel driver does not load.	Open the file /var/log/messages and search for messages with "kernel: pcoip_host:"  View details that are typically hidden while the system boots and review for startup errors and verify pcoip_host loads.
13	The local cursor and keyboard feature does not support entering and exiting low power modes (hibernate and standby). The <b>Local Cursor and Keyboard</b> feature may stop working on systems that exit the low power states.	Users wishing to put the workstation in a low power state should shut down/restart the workstation after exiting a low-power state.
14	Key presses on the keyboard are dropped when the <b>Local Cursor and Keyboard</b> and <b>Client Keyboard Repeat Detection</b> features are enabled, the latency of the PCoIP session exceeds 60 ms and the keyboard is connected behind a USB hub.	<b>Resolution:</b> Connect the keyboard directly to the zero client OR install firmware release 4.1.0 or later and ensure only HID devices (keyboard and mice) are connected to the USB hub.

Item	Description	Solution
15	<p>The local cursor movement is not smooth when the <b>Local Cursor and Keyboard</b> and <b>remote cursor synchronization</b> features are enabled and the mouse is connected to the zero client behind a USB hub.</p> <p>The local cursor does not move when the <b>Local Cursor and Keyboard</b> feature is enabled and the <b>remote cursor synchronization</b> feature is disabled and the mouse is connected to the zero client behind a USB hub.</p>	<p><b>Resolution:</b> Connect the mouse directly to a zero client USB root port OR install firmware release 4.1.0 or later and ensure only HID devices (keyboard and mice) are connected to the USB hub.</p> <p><i>Note: Some zero clients contain an integrated USB hub. USB devices connected to some USB ports are connected to a hub rather than a root port. Refer to the following article in the Teradici Knowledge Base at <a href="http://techsupport.teradici.com">http://techsupport.teradici.com</a> for additional details on identifying zero client USB root ports.</i></p> <p><i>How to identify which USB port on my PCoIP zero client is behind an integrated/internal USB hub? (15134-1486)</i></p>
16	<p>The zero client display topology settings are configured and enabled, but the settings are not activated when the PCoIP session starts.</p>	<p>The host software does not support activating client topology settings.</p> <p><b>Resolution:</b> Adjust the display configuration settings using applications installed on the workstation/PC. Example applications include nvidia-settings.</p>
17	<p>The following error message appears when starting the <code>pcoip_agent</code> application:</p> <pre>Xlib: extension "RANDR" missing on display ":0.0".</pre>	<p>This has been observed on a CentOS 6.2 system while Xinerama is enabled.</p> <p><b>Resolution:</b> Disable Xinerama or ignore the error message.</p>
18	<p>Both the remote and local cursors are visible while the <b>Visible Cursor(s)</b> option equals <b>Local</b>.</p>	<p>Section 6.3 describes known issues associated with hiding the remote cursor.</p>
19	<p>The <b>Visible Cursor(s)</b> dropdown menu does not include the <b>Local</b> option.</p>	<p>Section 6.3 describes known issues associated with hiding the remote cursor.</p>

Item	Description	Solution
20	The local and remote cursors are not in sync, or the cursor movement does not match the movement of the mouse.	<p>Typically the Linux distribution requires changes to the X Windows xorg.conf file. Refer to step 3 in section 3.4 for details on these changes.</p> <p>This might happen if <b>TwinView</b> is enabled on the workstation and the “-t” command line option is not specified when starting the host software executable.</p> <p>This has also been observed on multi-monitor workstations with <b>Xinerama</b> enabled running CentOS 6.3 and version 310.19 of the Nvidia driver.</p> <p><b>Resolution:</b> Start the UI by entering the command “pcoip_agent -t”.</p>
21	The local and remote cursors are not in sync, or the cursor movement does not match the movement of the mouse after changing the number of active monitors or the display resolution settings while logged in.	<p><b>Resolution:</b> Log off and log on again or press Ctrl-Alt-Backspace. Both actions restart the X server and may fix the problem.</p>
22	The workstation is not locked after a PCoIP session ends while a user is logged in and the <b>Lock host PC upon session termination</b> feature is enabled.	<p>The host software calls the pcoip_lockscreen script to lock the screen. See section 3.4 for details on the location of the script.</p> <p><b>Resolution:</b> Modify the script to lock the screen.</p>
23	The user experience is terrible while connected to a workstation over a PCoIP session. Mouse movements are slow and the bandwidth from the host to the client is high when the desktop image is static.	<p>Most likely the graphics card has enabled temporal dithering. See section 3 for additional details on temporal dithering.</p>
24	The UI closes after clicking the <b>Apply</b> button on the UI Monitor tab.	<p>This is a known problem that will be investigated in the future.</p> <p><b>Resolution:</b> Re-open the UI after clicking the <b>Apply</b> button.</p>
25	The PCoIP UI icon appears as a vertical bar instead of the PCoIP icon in the system tray.	<p>This is a known problem that will be investigated in the future.</p> <p><b>Resolution:</b> Right click the UI and select <b>Exit</b> or kill the pcoip_agent process and restart the host software executable.</p>

Item	Description	Solution
26	Sometimes the client displays an arrow cursor shape with an "L" in it when the <b>Local Cursor and Keyboard</b> feature is enabled and the <b>Local</b> cursor is visible.	Section 6.3 describes some scenarios that will cause this. The problem also occurs when the size of the host drawn cursor bitmap exceeds a limit negotiated by the client and host at the start of a session.

## 6.2 Requirements for Local Cursor and Keyboard Feature

The local cursor and keyboard feature depends on a number of requirements. If the **Enable Local Cursor and Keyboard** checkbox is grayed out, ensure the following requirements are met:

- PCoIP host and zero client both use the same firmware that supports local cursor and keyboard.
- The **Host Driver Function** option is enabled on the PCoIP host and the PC or workstation has been restarted after changing the option.
- A PCoIP session is established between the PCoIP host and client.
- The graphics card is not configured to scale the image (that is, not using technologies such as horizontal/vertical span mode from NVIDIA).
- The graphics card is configured to use the monitor's built-in scaling when a non-native resolution is selected.
- The display or displays are not rotated.
- If using firmware release prior to version 4.1.0, the mouse and keyboard devices are connected directly to the USB ports on the zero client (that is, the devices are not connected to a USB hub).
- If using firmware release 4.1.0 or later and the mouse or keyboard are connected behind a USB hub, ensure only HID devices (keyboard and mice) are connected to the USB hub.
- The mouse and keyboard devices function correctly with the zero clients' OSD.
- The **Enable Configuration** checkbox is checked on the OSD **User Settings->Display Topology** page.
- The resolution settings on the OSD **User Settings->Display Topology** page match the resolution settings of the X Window screens.
- The correct monitor information is configured on the UI **Monitors** tab.
- All active X Window monitors must be connected to one client.
- Verify the X Window output screens match the display outputs detected by the host card. The host card reports the display outputs on the **Info->Attached Devices** web page. To access this web page, log into the host card web interface and select **Attached Devices** from the **Info** menu.
- X Window multi-monitor workstations can be configured to overlap screens (physical displays) such that part of the image or the entire image shown on display 1 also appears on display 2. The local cursor feature does not work in systems configured in this manner. Verify none of the X Window screens overlap each other.



- The following table shows the supported video modes and the number of monitors supported in each mode. The **Local Cursor and Keyboard** feature will be disabled or fail to function properly on systems that configure the graphics card to use unsupported video modes, or the number of monitors is not included in the **Number of Monitors Supported** column.

Table 6-2: Supported Video Modes

TwinView	Xinerama	Number of Monitors Supported
disabled	enabled	1, 2, 3, or 4
disabled	disabled	1
enabled	disabled	2

Note: Some multi-monitor workstations using newer versions of the Nvidia driver (310.19) with **Xinerama** enabled must include the “-t” option when starting the pcoip\_agent. If the remote and local cursors are not in sync after starting the pcoip\_agent try restarting pcoip\_agent with the “-t” option.

## 6.3 Known Issues when Hiding the Remote Cursor

When the local cursor and keyboard feature is enabled users must configure the **Visible Cursor(s)** option. When this option equals **Local**, the host software hides the remote cursor. This section describes some problems that users may observe while the remote cursor is hidden.

1. Animated cursors are not supported on some Linux distributions. The client displays an arrow cursor shape with an “L” in it when an animated cursor is active.
2. Invisible cursor shapes are not supported on some Linux distributions. The client displays an arrow cursor shape with a “L” when an invisible cursor is active. On some systems an invisible cursor is used when users type text in a terminal.
3. Workstations with multiple monitors that enable Xinerama will notice the host cursor is not hidden when the cursor shape changes on monitors other than the primary monitor. The primary monitor is the monitor whose origin is located at position (0, 0). The host cursor remains visible until the cursor shape changes again on the primary monitor.
4. The host software hides the remote cursor using API found in version 4 or later of the XFixes package. The host software cannot hide the host cursor if version 4 or later of this package is not installed. The host software checks if the correct package is installed. If the correct package is not installed, the **Local** option is not included in the list of available **Visible Cursor(s)**.