

# **Remote Workstation Card Software for Linux Administrators Guide**

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**23.04**

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## Table of contents

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Overview	3
Remote Workstation Card Software for Linux Administrators' Guide	3
What's New in this Release	4
About the Remote Workstation Card Software for Linux	5
PCoIP Remote Workstation Card Software Component Overview	6
Host Driver Function	6
Remote Workstation Card Software User Interface (UI)	6
Remote Workstation Card Software Daemon	6
Requirements	7
Compatibility Overview	7
Requirements for Local Cursor and Keyboard	9
Installation Guide	10
Installing Required Tools and Libraries	10
Unpacking the Source Code Package	12
Creating a Binary RPM	13
Installing the PCoIP Remote Workstation Card Software Binary RPM	14
Install Command Summary	17
Uninstalling the Remote Workstation Card Software for Linux	18
Administrators Guide	19
Remote Workstation Card Software Daemon Configuration Files	19
Remote Workstation Card Software Configuration Files	22
Enabling or Disabling Host Driver Function	23
PCoIP User Interface	24
User Interface (UI) Overview	24
User Interface Tabs	25
Command Line Options pcoip_agent	37
Tablets	38
Local Tablet Driver	38
Tablet Requirements	39
Supported Tablets	40
Glossary	44
Troubleshooting	45
Known Issues When Hiding the Remote Cursor	49
Known Issues When Using Local Tablet Driver	50

# Overview

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## Remote Workstation Card Software for Linux Administrators' Guide

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This document is intended for administrators who are installing the Remote Workstation Card Software for Linux on workstations using the PCoIP Remote Workstation Card. It is recommended that users have an understanding of the [PCoIP protocol](#) and its [advantages](#) as well as environments using [PCoIP Remote Workstation Cards](#) and [PCoIP Clients](#).

This document provides guidelines for installing, uninstalling, using, and troubleshooting the Remote Workstation Card Software for Linux.

### Linux workstation operating systems

The instructions in this guide were made using [supported distributions of the Linux operating system](#). It may be necessary to consult your Linux documentation if using other versions of Linux and having command line syntax issues.

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## What's New in this Release

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- Introduced support for RHEL 8 and Rocky Linux 8

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## About the Remote Workstation Card Software for Linux

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The Remote Workstation Card Software for Linux package is a source code package. This package is used to create a binary RPM that can then be installed on Linux workstations containing a PCoIP Remote Workstation Card. Problems with the package should be reported via the [Support Site](#).

Remote Workstation Card Software provides additional features and enhancements used via the PCoIP Remote Workstation Card installed in a remote workstation, and provides compatibility for PCoIP Zero Clients or PCoIP Software clients in sessions with Remote Workstation Cards.

Remote Workstation Card Software works with the PCI device function called Host Driver Function which is enabled in the Remote Workstation Card firmware. If the administrator installs the software on the workstation, users can manage additional features.

The Remote Workstation Card Software user interface (UI) is installed when the Remote Workstation Card Software is installed. The UI communicates with the PCoIP firmware via the device drivers installed by the Remote Workstation Card Software, and configures the features of the Remote Workstation Card Software.

This software allows users to:

- Use a local cursor and keyboard
- Use a [local Wacom tablet driver](#) (requires minimum Remote Workstation Card and Zero Client firmware versions, and may require the latest Wacom driver)
- Push client display topology to the host
- Lock the host workstation when a session is terminated
- Disconnect a session
- View host statistics and connection information
- Adjust the PCoIP session Image Quality preference setting
- Facilitates communications between the Remote Workstation Card Agent and the Remote Workstation Card.

## PCoIP Remote Workstation Card Software Component Overview

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The Remote Workstation Card 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 Remote Workstation Card Software is installed on. This restriction prevents the distribution of pre-built RPMs.

This package allows administrators the ability to [create a binary RPM](#) that can be used on multiple workstations that host the same operating system. The installation category of topics describe requirements and steps to set up a Linux system capable of creating the PCoIP Remote Workstation Card Software binary RPM. The instructions are written for supported Linux distributions with a GNOME or KDE desktop environment installed. The same instructions may apply to other Linux distributions, but may require changes.

The Remote Workstation Card Software for Linux requires knowledge of the [Host Driver Function](#), [User Interface](#), and the [Remote Workstation Card Software Daemon](#) components which are summarized below.

### Host Driver Function

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Host workstations containing PCoIP Remote Workstation Cards support an optional feature, the PCoIP Host Driver Function. This feature lets administrators use the PCoIP Remote Workstation Card Software for Linux package on the host workstation. This software package works with the exposed PCoIP Host Driver Function PCI device function. If an administrator installs the PCoIP Remote Workstation Card Software package on the workstation, users can manage and use the features of the PCoIP Remote Workstation Card Software for Linux when the Host Driver Function is enabled.

### Remote Workstation Card Software User Interface (UI)

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

### Remote Workstation Card Software Daemon

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By default, the daemon is enabled and starts running when the workstation boots and is responsible for:

- Starting the UI when the workstation boots and ensuring one instance of the UI is always running. The daemon restarts the UI if it exits for any reason.
- Activating the Local Cursor and Keyboard feature for soft client sessions while the login screen is active.
- Disabling the Local Cursor and Keyboard feature for Zero Client sessions when a user logs off.

For details on configuring the daemon, see [Remote Workstation Card Software Daemon Configuration Files](#).

# Requirements

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## Compatibility Overview

Some features added to new releases of the Remote Workstation Card Software require firmware upgrades on the PCoIP Remote Workstation Card and/or PCoIP Client. We recommend that you install the PCoIP Remote Workstation Card Software release that corresponds to the corresponding version of Remote Workstation Card firmware.

### Software Client Limitations

- USB devices connected to PCoIP Software Client hosts are not supported when connecting to Remote Workstation Cards or Remote Workstation Card Agents.
- Users cannot disable the local cursor feature while connected to the workstation from a soft client.

### Graphic card temporal dithering

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. Knowledge Base article [KB 1087](#) on the Support Site also contains information on disabling temporal dithering on some graphics cards.

## Pre-Requisites

Before installing this release of PCoIP Remote Workstation Card Software, ensure the following requirements are met:

### Installation from Host PC

The Linux host operating system administrator must not install Remote Workstation Card Software from a software client as functionality of the mouse and keyboard will be lost.

## Firmware

The following firmware versions and settings must be used in your environment for Remote Workstation Card Software to function as expected.

- Compatible host firmware and client: The Remote Workstation Card firmware and PCoIP client used with Remote Workstation Card Software must be the same version or include the immediate preceding version.
- Enabled Host Driver Function: Ensure the Host Driver Function is enabled on the Remote Workstation Card. See section [PCoIP Remote Workstation Card Software Installation](#).

## nVIDIA GPUs:

Systems with nVIDIA GPUs must have the nVIDIA drivers installed and ready for use.

To verify your nVIDIA drivers are installed and ready for use

- Execute `lsmod | grep nvidia`. If the response is populated with data, then the drivers are loaded and ready for use.
- Execute `lsmod | grep nouveau`. A null response means open source nVIDIA drivers are not being used.

### Linux Distributions

Remote Workstation Card host workstation must be operating a supported Linux distribution. Remote Workstation Card Software might work on other Linux distributions, but there are no guarantees. The following distributions are supported:

- CentOS 7
- RHEL 7 & 8
- Rocky Linux 8

### Linux Configurations

The following Linux configuration must be setup in your Linux environment.

- Sudo Permissions: The Linux host operating system administrator installing this package must be able to execute sudo commands.
- Desktop environment: GNOME or KDE
- Display Manager: X11 (Wayland is not supported)

#### Rocky Linux display manager when using nVIDIA drivers

Rocky Linux currently uses Wayland display manager by default. Rocky Linux environments using nVIDIA GPU's work by default because the nVIDIA driver installation currently disables the Wayland display manager. If you experience issues installing Remote Workstation Software for Linux on Rocky Linux with an nVIDIA GPU, ensure that the X11 display manager is being used instead of Wayland for both login screen and logged in system functionality.

### Dependencies

The following software dependencies must be included in your Linux environment prior to installation of Remote workstation Card Host Software for Linux.

- python 3
- Qt 5.9 - 5.15
- Tray Icons extension for RHEL 8 and Rocky Linux 8
- RPM build tools
- Compiler: gcc
- Kernel header files required to build kernel driver: kernel-devel
- Tools used to build RPM files: rpm-build

### Tablets

If you use a Wacom tablet your PCoIP host workstation requires the correct kernel. This means Wacom tablet users may have to update the Linux kernel Wacom driver. Supported tablet operation information can be found in the [tablet](#) section of this guide.



## Requirements for Local Cursor and Keyboard

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The Enable Local Cursor and Keyboard settings are configured from the user interface [Features tab](#).

There are requirements for the local cursor and keyboard feature. If the Enable Local Cursor and Keyboard checkbox is grayed out, ensure the following requirements are met:

- The Host Driver Function option is enabled on the PCoIP Remote Workstation Card and the workstation is restarted after changing the option.
- A PCoIP session is established between the PCoIP Remote Workstation Card 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.
- If the mouse or keyboard are connected behind a USB hub, ensure only HID devices (keyboard and mouse) are connected to the USB hub.
- The mouse and keyboard devices function correctly with the client.
- The Enable Configuration option is selected on the PCoIP Zero Client OSD User Settings > Display Topology tab.
- The resolution settings on the OSD User Settings > Display Topology tab match the resolution settings of the X Window screens.
- All active X Window monitors must be connected to one client.
- Verify the X Window output screens match the display outputs detected by the Remote Workstation Card. The Remote Workstation Card reports the display outputs on the Info > Attached Devices window. To access this window, log into the Remote Workstation Card AWI and select Info > Attached Devices.
- 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.

# Installation Guide

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## Installing Required Tools and Libraries

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To create the binary RPM the required packages to compile, build the kernel, and build the RPM must be installed. The packages may differ based on the Linux distributions running on the host workstation.

### Notes

- If the `kernel-devel` or `kernel-default-devel` package must be installed, ensure you install the version compatible with the kernel installed on the workstation. If you install the wrong version, the driver fails to build and the error message `install: cannot start `pcoip_host.ko': No such file or directory` appears while installing the RPM file created by the `createRPM` script. See [Requirements](#) for which Linux distributions (kernel-devels) are supported.
- Non-root users can install the `fakeroot` package to run the `createRPM` script.

### CENTOS 7 OR RHEL 7

Open a terminal and type:

```
sudo yum install gcc make
sudo yum install "kernel-devel-uname-r == $(uname -r)"
sudo yum install elfutils-libelf-devel
sudo yum install qt5-qtbase qt5-qtbase-gui
sudo yum install python3
sudo yum install rpm-build
```

### RHEL 8 OR ROCKY LINUX 8

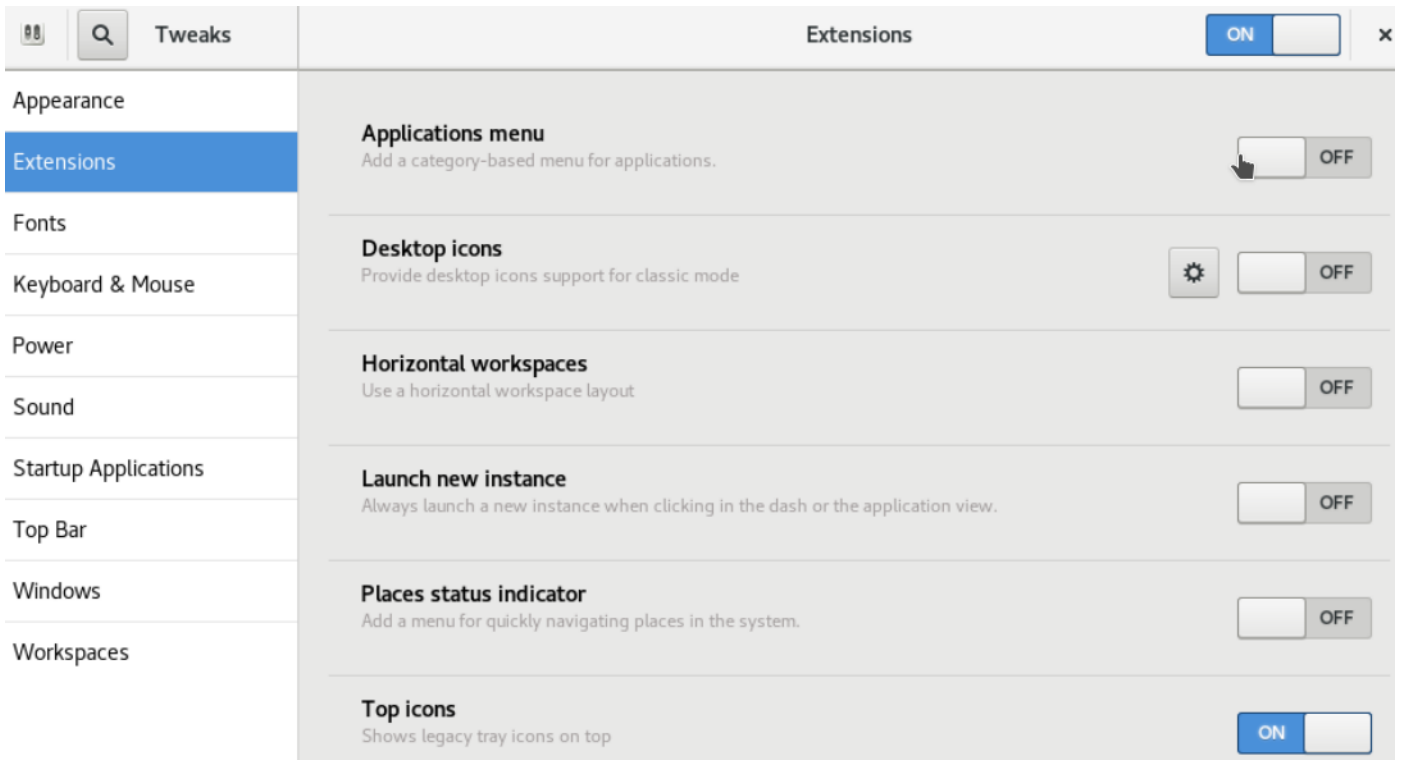
1. Open a terminal and run the following commands.

```
sudo dnf install gcc make
sudo dnf install kernel-devel-$(uname -r)
sudo dnf install elfutils-libelf-devel
sudo dnf install qt5-qtbase qt5-qtbase-gui
sudo dnf install python3
sudo dnf install rpm-build
sudo dnf install gnome-shell-extension-top-icons gnome-tweaks
```

2. From the terminal run Tweaks.

```
gnome-tweaks
```

3. Enable Top icons from the Tweaks enabled Extensions window.



!!! tip 'No top icons' If Top icons does not display, reboot the host workstation.

## Unpacking the Source Code Package

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To unpack the source code package:

1. Download the `rcw-software-XX.YY.Z.tar.gz` package from the [Support Site](#).

The archive file contains the files necessary to create a binary RPM.

2. Navigate to the Downloads folder.

```
cd Downloads
```

3. Extract the contents of the archive file into a new folder.

```
mkdir PCoIP_Host_SW_Release  
tar -zxvf rcw-software-XX.YY.Z.tar.gz -C PCoIP_Host_SW_Release
```

4. Open the new directory and check that the `/pcoip_host_XX.YY.Z.axxxx` folder is there.

```
cd PCoIP_Host_SW_Release<br />ls
```

### Subfolders created

Extracting `rcw-software-XX.YY.Z.tar.gz` creates additional sub-folders such as `common`, `kernel`, and `user`.

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## Creating a Binary RPM

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To create a Binary RPM you will require rights to the `sudo` command.

### Notes

- When creating RPMs to be distributed outside a company, create the RPM as root. 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 getting these warning messages.
- Non-root users can install the `fakeroor` package to run the `createRPM` script found in the Remote Workstation Card Software for Linux package.

1. From your previously open terminal working from the `Downloads` directory, set the working directory to `kernel/linux/scripts`

```
cd pcoip_host_<version>/kernel/linux/scripts/
```

### Info

- Additional directories are created when you unpack the source code package.
- If opening a new terminal window, from the default prompt enter

```
cd ~/Downloads/PCoIP_Host_SW_Release/pcoip_host_<version>/kernel/linux/scripts/
```

2. Execute the `createRPM` script.

```
sudo ./createRPM
```

### Info

The binary rpm is written to the `package/kernel/linux/obj` directory.

## Installing the PCoIP Remote Workstation Card Software Binary RPM

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This topic describes how to install the binary RPM created from the source code package. To install the software you will require sudo command privileges.

Before installing the PCoIP Remote Workstation Card 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 [Uninstalling PCoIP Remote Workstation Card Software](#).

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 **Note**

As an administrator, you cannot run the Remote Workstation Card Software installer while connected to a host system using a software client because 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.

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1. From the previously open terminal window, set the working directory to `kernel/linux/obj/`

```
cd ..
cd obj
```

#### Notes

- Additional directories are created when you unpack the source code package.
- If not at the default command prompt working directory enter `cd ~/Downloads/PCoIP_Host_SW_Release/pcoip_host_<version>/kernel/linux/obj/`

2. Enter the following command, where < build number > is the release build number.

```
sudo yum install -y pcoip_host-<build number>.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 [Command Line Options –pcoip\\_agent](#) for a description of the supported options.
- `/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 Remote Workstation Card 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 Remote Workstation Card Software is installed. If you want to move these files to a different location, such as a network drive, you 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.
- If the `pcoip_agent` and `pcoip_lockscreen` files are moved, and a new version of the Remote Workstation Card Software is installed, the administrator must remove the old copies of these files and replace them with the new files found in the `/usr/bin` directory.

- `/usr/bin/pcoiphostswd`: This is the Remote Workstation Card Software daemon. See [Overview](#) for a description of what the daemon does and [Remote Workstation Card Software Daemon Configuration Files](#) for instructions on how to configure the daemon. If you want to establish a PCoIP session with a workstation from a soft client, do not disable the daemon.
- `/usr/bin/pcoip_starhostsw`: The daemon uses this script to start the Remote Workstation Card Software executable (`pcoip_agent`). Administrators who want to modify the command line options passed to the Remote Workstation Card Software executable should modify the daemon configuration settings in section 3.5.1 "Remote Workstation Card Software Daemon Configuration Files".
- `/usr/bin/pcoip_xauthority`: The daemon uses this script to acquire an XAUTHORITY cookie. The script is run by the daemon as root. The daemon calls this script to provide some flexibility to the end user. If the script does not support the window manager running on the workstation, the script can be modified to support the new window manager without recompiling the daemon. See the script for details on how to update it if necessary.
- `/lib/modules/< kernel_version >/kernel/drivers/input/misc/pcoip_host.ko`: This is a kernel driver that communicates with the PCoIP Remote Workstation 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  $\leq 6$ . 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  $\leq 6$ . 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. Restart the system.

```
sudo reboot
```



## Install Command Summary

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The following commands were used in this guide to install the Remote Workstation Card Software for Linux (including adding dependencies). It is intended to be used as a reference after reading through all the topics under the Installation topic. These commands were relevant to a host workstation using a supported Linux operating system and may require changes for different distributions of Linux.

### CENTOS 7 / RHEL 7

```
sudo yum install gcc make
sudo yum install "kernel-devel-uname-r == $(uname -r)"
sudo yum install elfutils-libelf-devel
sudo yum install qt5-qtbase qt5qtbase-gui
sudo yum install python3
sudo yum install rpm-build
cd Downloads
unzip Host_Software_for_Linux_<version_no>_GA -d PCoIP_Host_SW_Release
cd PCoIP_Host_SW_Release
ls
tar -xvf pcoip_host-<version_no>.tar.gz
cd pcoip_host_<version>/kernel/linux/scripts/
sudo ./createRPM
cd ..
cd obj
sudo yum install -y pcoip_host-<build number>.x86_64.rpm
sudo reboot
```

### RHEL 8 / ROCKY LINUX 8

```
sudo dnf install gcc make
sudo dnf install "kernel-devel-uname-r == $(uname -r)"
sudo dnf install elfutils-libelf-devel
sudo dnf install qt5-qtbase qt5-qtbase-gui
sudo dnf install python3
sudo dnf install rpm-build
sudo dnf install gnome-shell-extension-top-icons gnome-tweaks
cd Downloads
unzip Host_Software_for_Linux_<version_no>_GA -d PCoIP_Host_SW_Release
cd PCoIP_Host_SW_Release
ls
tar -xvf pcoip_host-<version_no>.tar.gz
cd pcoip_host_<version>/kernel/linux/scripts/
sudo ./createRPM
cd ..
cd obj
sudo yum install -y pcoip_host-<build number>.x86_64.rpm
sudo reboot
```

The commands to add the latest Wacom drivers can be found within [Wacom's installation article](#).

## Uninstalling the Remote Workstation Card Software for Linux

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You can easily remove the PCoIP Remote Workstation Card Software from the workstation at any time. If you no longer need the software, you should also disable the Host Driver Function in firmware. For details, see [Disabling Host Driver Function](#).

To uninstall the Remote Workstation Card Software for Linux, open up a command prompt and enter:

```
sudo rpm -e pcoip_host
```

### Note

The above step removes the installed PCoIP Remote Workstation Card Software, but does not remove any PCoIP Remote Workstation Card Software that might be running. Reboot the workstation to ensure the PCoIP Remote Workstation Card Software is no longer running.

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# Administrators Guide

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## Remote Workstation Card Software Daemon Configuration Files

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This topic describes the Remote Workstation Card Software configuration files. Both the daemon and the User Interface allow the administrator to customize their operation.

When the Remote Workstation Card 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 Remote Workstation Card Software in the `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 Remote Workstation Card Software or the workstation.

The daemon and Remote Workstation Card Software executables support the following settings.

### LOG DIRECTORY LOCATION

- Field name: `LogDirLocation`
- This field is a string that determines the directory used for the log files. The daemon and Remote Workstation Card Software use the same log file named `pcopiphostsw.0.log`. When the log file reaches the size specified in the `LogFileSize` parameter, it is copied to `pcopiphostsw.1.log`. The daemon sets the permissions of the directory containing the log files to 777. If the location of the log files is changed to something other than the default, the daemon sets the permissions of the directory to 777.
- Default value: `/var/log/pcopip`

### MAXIMUM LOG FILE SIZE

- Field name: `LogFileSize`
- This field is an integer that specifies the maximum size in MB a log file may attain before a copy is made and a new one is started. The log file size is only checked periodically, so this size may be exceeded slightly at times.
- Default value: 2

### DAEMON ENABLE

- Field name: `DaemonEnable`
- This field determines whether the daemon is enabled. The daemon must be enabled in systems that require the Remote Workstation Card Software to be running while the login screen is active. Software clients send keyboard and mouse data to the host via the Remote Workstation Card Software. Users who want to log into a host using a software client must enable the daemon.
- Supported values: 0, 1 (0=disable, 1=enable)
- Default value: 1

### DAEMON 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 to `info` or `error`, which generates error messages and informational messages when the daemon starts and stops the Remote Workstation Card Software.
- 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 `pcopip_host` script starts `pcopiphostswd`, which launches a daemon process. When the daemon starts, it delays this many seconds before entering.

- Supported values: positive integer (1, 2, 3, ...)
- Default value: 1

#### DAEMON X AUTHORITY START DELAY

- Field name: `DaemonXAuthDelay`
- This field specifies the delay in seconds before the daemon tries to find the XAUTHORITY cookie for the Remote Workstation Card Software UI.
- Supported values: positive integer (1, 2, 3, ...)
- Default value: 5

#### DAEMON PCOIP AGENT CAN RUN UNDER ROOT PERMISSIONS

- Field name: `DaemonRootPCoIPAgent`
- This field specifies whether the daemon can run the PCoIP Agent under root permissions. !!! Note Some systems do not allow root to run the screensaver and therefore the Lock workstation on disconnect feature does not work. It is recommended that you log in as root and see if root can run the screensaver before enabling this setting. Currently, RHEL 7, RHEL 7.1, and CentOS 7 allow the root account to run the screensaver.
- Supported values: 0, 1 (0=disable, 1=enable)
- Default value: 0

#### REMOTE WORKSTATION CARD SOFTWARE LOGGING LEVEL

- Field name: `HostSWLogLevel`
- This field controls the verbosity level of the Remote Workstation Card Software. As the level increases, the Remote Workstation Card Software generates more log messages. In general, users should set this field to info or error, which allows the Remote Workstation Card Software to generate error messages and informational messages.
- Supported values: 0, 1, 2, 3, 4 (0=none, 1=Critical, 2=Error, 3=Info, 4=Debug)
- Default value: 3 (info)

#### REMOTE WORKSTATION CARD SOFTWARE LOCATION

- Field name: `HostSWPath`
- This field specifies the location of the Remote Workstation Card Software. This includes the `pcoip_starthostsw` script and the `pcoip_agent` executable. By default, these files are installed in `/usr/bin`.
- Default value: `"/usr/bin"`

#### REMOTE WORKSTATION CARD SOFTWARE OPTIONS

- Field name: `HostSWOptions`
- This field can pass further options to the Remote Workstation Card Software. These values are passed to the `pcoip_starthostsw` script (preceded with `-o`) and subsequently to the Remote Workstation Card Software itself. The supported values can be determined by running `pcoip_agent -h`, and include values such as: `- drcs` (disable sending remote cursor changes to client).
- Default value: `""`

#### HOST SW LOGIN START DELAY

- Field name: `HostSWLoginStartDelay`
- When a user logs in, the daemon starts the Remote Workstation Card Software. The daemon also starts the Remote Workstation Card Software when it detects the Remote Workstation Card Software is not running. This setting controls how many seconds the daemon delays before starting the Remote Workstation Card Software when a user logs in. The setting is not used when the daemon detects the Remote Workstation Card Software is not running. This delay should be increased if the Remote Workstation Card Software icon appears on the desktop instead of the system tray after a user logs in.
- Supported values: positive integer (1, 2, 3,...)
- Default value: 10

#### HOST SW RESTART DELAY

- Field name: `HostSWRestartDelay`

- When a user logs in, the daemon starts the Remote Workstation Card Software. The daemon also restarts the Remote Workstation Card Software when it detects the Remote Workstation Card Software is not running. This settings controls how many seconds the daemon delays before restarting the Remote Workstation Card Software when a user is already logged in. The setting is not used when the daemon starts the Remote Workstation Card Software on user login.
- Supported values: positive integer (1, 2, 3,...)
- Default value: 1

#### Login screen X display

- Field name: LoginScreenXDisplay
- Determines which X display server to connect to when in the login screen. This setting is only used for the X server connection login screen and does not affect the X server connection for user sessions.
- Supported values: :0, :1, :2, :3, :4, ... (the value that correspond to valid X display)
- Default value: :0
- LoginScreenXDisplay=:0

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## Remote Workstation Card Software Configuration Files

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When the Remote Workstation Card 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>` in the `HostSWOptions` setting in the daemon configuration file.

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 Remote Workstation Card Software default settings for first time users.

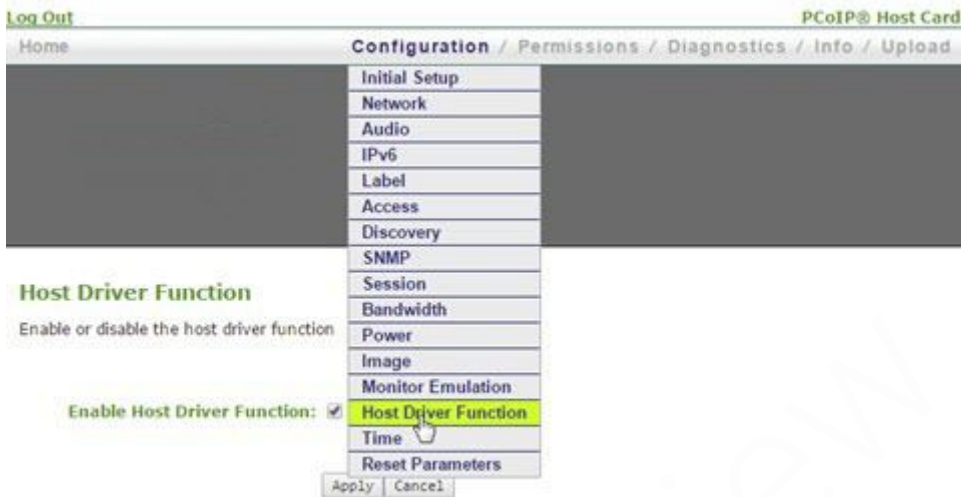
A sample global configuration file is provided with the Remote Workstation Card Software in `kernel/linux/scripts/pcoiphostswglobal.conf`. Administrators who want to use this feature should store a copy of the file in the `/etc` directory. Users who want to store the file somewhere else must include the `-gc` option in the `HostSWOptions` setting in the daemon configuration file.

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## Enabling or Disabling Host Driver Function

To enable or disable the Enable Host Driver Function on the PCoIP Remote Workstation Card:

1. Open a web browser from a device on the same network as the host workstation and browse to the PCoIP Remote Workstation Card's Administrative Web Interface (AWI), and then log in.
2. From the Configuration menu, select Host Driver Function.



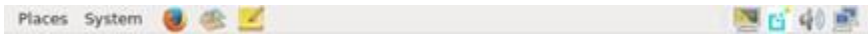
3. Check or uncheck the Enable Host Driver Function box and click Apply. Removing the check will disable the Host Driver Function. A prompt appears to indicate the host PCoIP processor must be reset.
4. Click Reset and then click OK to schedule a deferred reset.
5. Restart the workstation with the PCoIP Remote Workstation Card installed.
6. After the workstation boots up, log into the workstation as usual.

## PCoIP User Interface

### User Interface (UI) Overview

The UI executable `/usr/bin/pcoip_agent` is started automatically by the daemon after installing the PCoIP Remote Workstation Card Software package and rebooting the workstation. The administrator may need to configure the UI executable options. If so, install and update the daemon configuration file, described in [Remote Workstation Card Software Daemon Configuration Files](#).

When the UI is running, the icon appears in the CentOS 6 system tray as shown below.



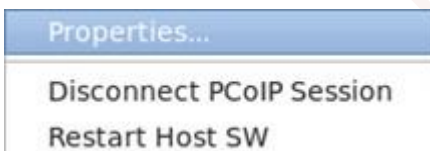
On RHEL 7 and CentOS 7, the icon appears after you click the bottom right number badge as shown below. The icon does not appear when the login screen is active.



#### Note

Sometimes a vertical bar appears in the system tray instead of the icon or the icon appears at the top corner of the display rather than on the task bar. The Remote Workstation Card Software functions properly but the UI is difficult to access. To work around these problems, try to modify the length of time the daemon waits before starting the Remote Workstation Card Software by adjusting the `HostSWLoginStartDelay` Or `HostSWRestartDelay` options in the `StartHostSWOptions` setting in the `/etc/pcoiphostswd.conf` file.

The figure below displays the menu that appears when you right-click 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 beginning within the `Features` tab.



- To disconnect the PCoIP session (if one is active), select `Disconnect PCoIP Session`.
- To restart the UI executable, select `Restart Host SW`.



## User Interface Tabs

### Features

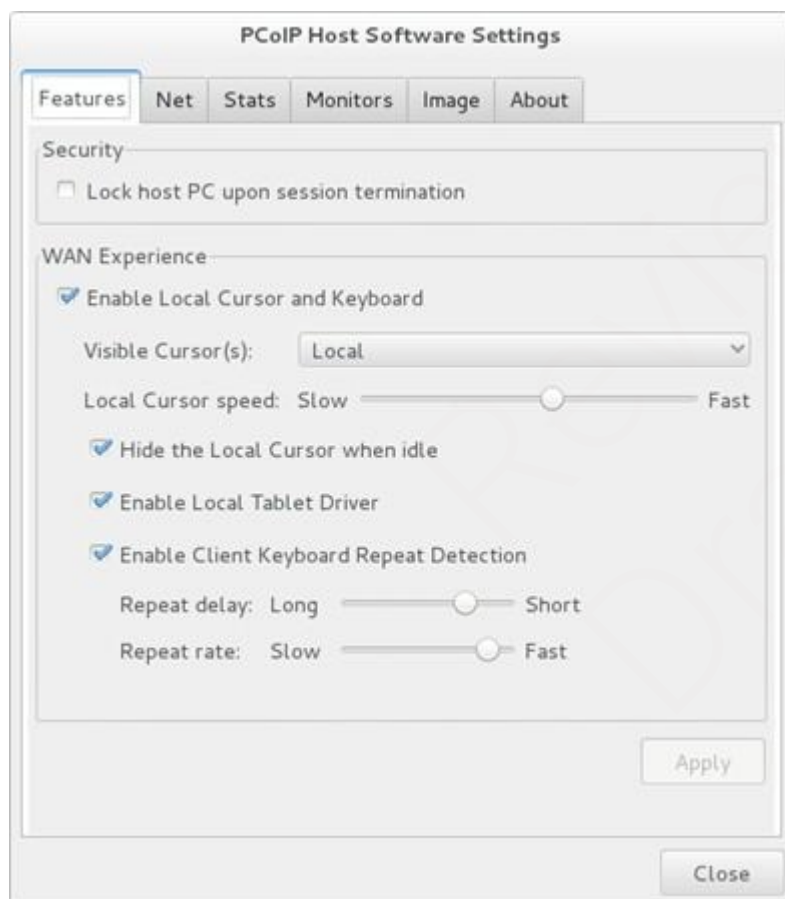
#### UI FEATURES TAB

The Features tab contains the Security lock host PC upon session termination setting and WAN Experience settings that allow a user to improve the user experience. The WAN experience settings benefit networks that have high latency times such as 40-60 ms. Each section is described in separate topics.

#### Note

The Image tab contains an image quality setting that can also affect the user experience but is used when the network between the PCoIP Remote Workstation Card and the client is constrained.

The following figure show the Features tab of the User Interface.



**UI FEATURES TAB - SECURITY**

The Security feature lets you lock the host 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 to lock the host workstation when a PCoIP session is disconnected.

 **Note**

The Remote Workstation Card Software calls the pcoip\_lockscreen script to lock the screen. If the Remote Workstation Card Software fails to lock the screen when a PCoIP session is disconnected, verify that this script works. See [Installing PCoIP Remote Workstation Card Software Binary RPM for the location of the script](#).

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## UI FEATURES TAB - 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.

Review  
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**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.

Review  
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- Visible Cursor(s): The available options are:
- Remote: Cursor shape drawn by the host workstation. When the Remote: Visible cursor is selected, you cannot select Hide the Local Cursor when idle.
- Local: Cursor shape drawn by the client. When the Local visible cursor option is selected, the remote cursor is hidden. The local cursor overlay icon appears as an arrow with an  $\perp$  in it when the local cursor is visible and the Remote Workstation Card Software cannot display the correct host workstation drawn cursor. For details including information on problems that may occur when hiding the remote cursor, see [Known Issues When Hiding the Remote Cursor](#). Local and Remote: Both the local and the remote workstation cursors are viewable.
- Local 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 using the PCoIP On Screen Display (OSD). See your version of the [PCoIP® Zero Client Firmware Administrators Guide](#).

- Hide the Local Cursor when idle: Select this option to set the local cursor overlay to disappear after one second of idle mouse movement. Uncheck this box to always display the local cursor overlay.

 **Note**

The PCoIP Remote Workstation Card 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 might disable the Local Cursor and Keyboard feature for the work client and enable the feature for the home client.

- Enable Local Tablet Driver: The local tablet driver is enabled when this option is selected and the tablet device's movements are recorded at the client. The movement is reflected via the local cursor overlay in real time. All data received from the tablet is sent to a tablet driver running on the host workstation.

 **Note**

The Enable Local Tablet Driver option may be grayed out if not supported. [Local Tablet Driver](#) describes why the feature may be disabled.

- Enable Client Keyboard Repeat Detection: Select this option for the client to perform keyboard repeat detection. Uncheck this box for the host OS to 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 length 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.

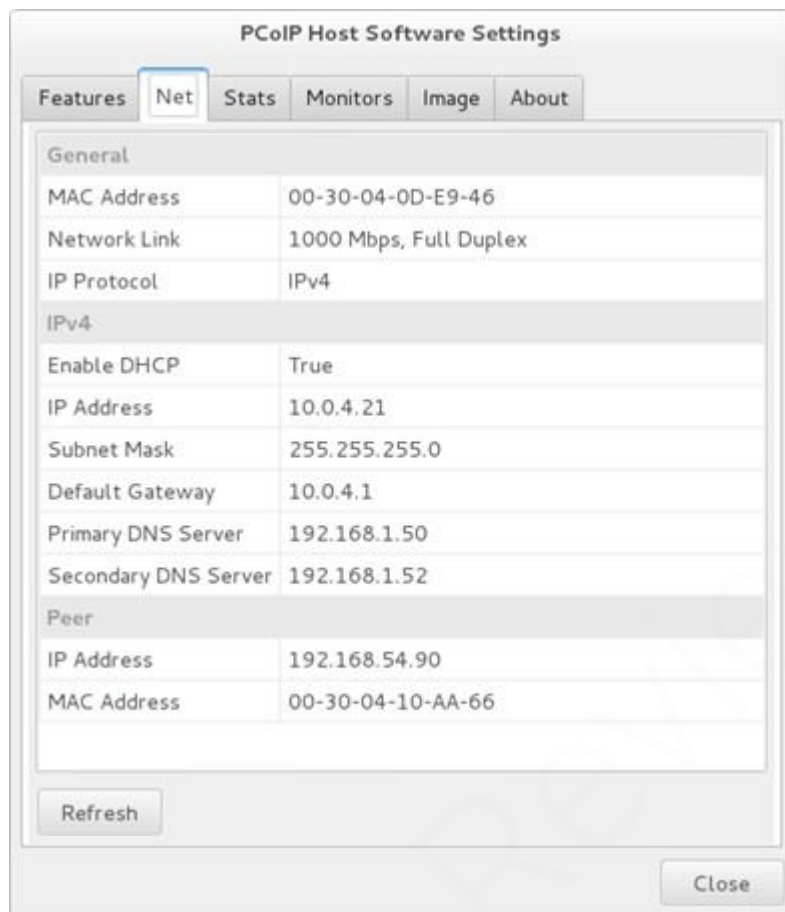
 **Note**

You can also configure the Zero Client Repeat delay and Repeat rate using the OSD. See your version of the [PCoIP® Zero Client Firmware Administrators Guide](#).

## UI Network Tab

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

PCoIP Remote Workstation Card Software Settings - Network Tab



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 network settings. You can configure the network settings through the [PCoIP Management Console](#), [Tera2 PCoIP® Zero Client Firmware](#) or [Remote Workstation Card Firmware](#).

## Statistics

The following figure shows the Stats tab. This lets you view the PCoIP host session statistics. The statistics are reset when a PCoIP session starts or when you click Reset Statistics.

### Note

You can also access the PCoIP Remote Workstation Card statistics through the PCoIP Administrative Web Interface (see [Tera2 PCoIP® Zero Client Firmware Administrators' Guide](#) or [Remote Workstation Card Firmware Administrators' Guide](#)).

PCoIP Remote Workstation Card Software Settings - Statistics Tab

PCoIP Host Software Settings					
Features	Net	Stats	Monitors	Image	About
<b>Traffic</b>					
PCoIP Packets Sent	286496				
PCoIP Packets Received	400411				
PCoIP Packets Lost	0				
Bytes Sent	73792352				
Bytes Received	115424250				
<b>Round Trip Latency</b>					
Min / Current / Max Latency	2 / 2 / 4 ms				
<b>Bandwidth</b>					
Active Limit	19370 kbps				
Min / Current / Max Utilization	16 / 304 / 14624 kbps				
<b>Imaging</b>					
Display 1 Frame Rate	6 fps				
Display 2 Frame Rate	0 fps				
Display 3 Frame Rate	0 fps				
Display 4 Frame Rate	0 fps				
Reset Statistics					
Close					

### 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 ( $\pm 1$  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 [Tera2 PCoIP® Zero Client Firmware Administrators' Guide](#) or [Remote Workstation Card Firmware Administrators' 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).

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## UI Monitors Tab

The monitors tab displays different information depending on which version of xrandr is being used or if Zero Clients are part of the workstation configuration. Further explanations for each configuration are described by one of the following categories:

- If Xrandr is installed on the workstation, the Monitors tab presents information about the attached displays.
- If using Zero Clients, configure the client topology settings.

### XRANDR

The figure below is an example of the Monitors tab of a system running Xrandr with four monitors.

PCoIP Remote Workstation Card Software Settings - Monitors using Xrandr

The screenshot shows the 'PCoIP Host Software Settings' window with the 'Monitors' tab selected. It displays 'X windows screen information' and a table of monitor details.

X windows screen information.	
Screen 1 - 1920x1200 at (1920, 1200)	DVI-I-1
Screen 2 - 1920x1200 at (0, 1200)	DP-0
Screen 3 - 1920x1200 at (0, 0)	DP-2
Screen 4 - 1920x1200 at (1920, 0)	DP-4

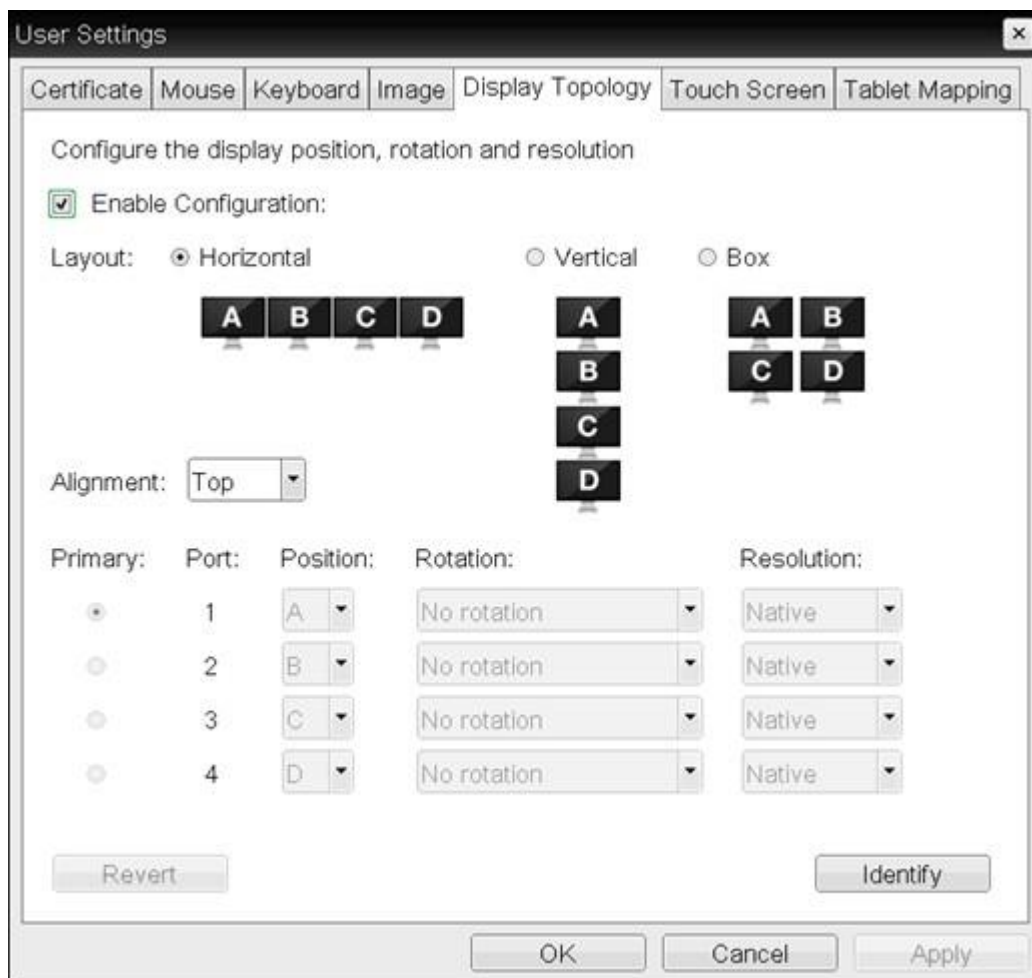
	Name	Vendor ID	Product ID	Serial Number	Size
DP-2	DELL U2412M	DEL	A07B	YMYH132M1VGL	1920x1200
DP-4	DELL U2412M	DEL	A07B	M2GCR29G0E1L	1920x1200
DP-0	DELL U2412M	DEL	A07B	YMYH14B10TVS	1920x1200
DVI-I-1	DELL U2412M	DEL	A07B	YMYH14B10J1S	1920x1200

Buttons: Apply, Close

### ZERO CLIENT DISPLAY SETTINGS

The Display Topology tab is on the Zero Client OSD User Settings page.

Zero Client OSD Display Topology



- Ensure Enable Configuration is selected. This setting is selected by default.
- 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.

For more information on multi-monitor systems, see [Requirements for Local Cursor and Keyboard](#).

## UI Image Tab

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

PCoIP Remote Workstation Card 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).

## **UI About Tab**

The About tab lets you view the version information of the PCoIP Remote Workstation Card Software.

Review  
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## Command Line Options pcoip\_agent

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

### Note

The daemon starts the UI. Do not start the Remote Workstation Card Software manually. In some situations a user might invoke the `pcoip_agent` command from the command line to disconnect a session or query information about the Remote Workstation Card.

- 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.
- The UI IT auditing feature writes information about the workstation and PCoIP Remote Workstation Card to the command line. To invoke this feature, enter `pcoip_agent -info`. This 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 Remote Workstation Card MAC: 00-30-04-0D-61-26
PCoIP Remote Workstation Card IP: 192.168.99.21
```

- 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 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 Remote Workstation Card 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 Remote Workstation Card 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, add the `-t` option to the `HostSWOptions` setting in the daemon configuration file and restart the Remote Workstation Card Software.

- Remote Workstation Card Software includes 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 to the `HostSWOptions` setting in the daemon configuration file and restart the Remote Workstation Card Software.
- When the remote cursor synchronization feature is enabled, the Remote Workstation Card 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 Remote Workstation Card Software to send reports every 10 ms.

### Note

Zero client users that set Visible Cursor(s) 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 ms to 10 ms to avoid choppy cursor movement.

- The command line options `-gc=` and `lc=` can be used to specify a global configuration file and local configuration file. See [Remote Workstation Card Software Configuration Files](#) for details on using these options.

## Tablets

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### Local Tablet Driver

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In some networks users may notice a visible lag between the movement of the tablet stylus and the movement of the cursor. Using the local tablet driver feature in the Remote Workstation Card Software helps improve the user experience by reducing the effects of latency in some networks where network latency exceeds 40-60 ms. To activate this feature, check the Enable Local Tablet Driver located on the PCoIP Remote Workstation Card Software [Features](#) tab. Support for some Wacom models may require a minimum firmware version be loaded on the Zero Client.

When the Enable Local Tablet Driver feature is enabled, there are different tablet behaviors depending on whether there is an established PCoIP session or whether you are using the tablet just before entering a PCoIP session.

- In-session  
When enabled, [supported tablets](#) have full Wacom driver feature support while in-session.
- Pre-session  
When enabled or disabled, supported tablets in pre-session have cursor movement and single selection functionality.
- Newly Released Tablets  
Newer tablets may require tablet drivers not yet installed in the Linux kernel of your host workstation. To install the latest Wacom tablet drivers, visit [Wacom's installation article](#) for links to the latest Wacom kernel drivers and for installation instructions. The latest drivers can also provide fixes to issues and support for new models.

#### Notes

- Tablet display mappings can be found in the [Zero Client OSD user settings](#).
- Unsupported tablets are automatically bridged to the host and may provide a favorable user experience in networks with low latency.

## Tablet Requirements

There are requirements for the local tablet driver feature to work properly. If the Enable Local Tablet Driver checkbox is grayed out, ensure the requirements are met.

### Software and Hardware Requirements

- The PCoIP Remote Workstation Card firmware must be 5.x or higher.
- The PCoIP Zero Client firmware must be 5.x or higher.
- The PCoIP Remote Workstation Card and Zero Client must be Tera2 devices.
- The workstation Linux OS kernel version must be 2.6.30 or higher.

 **Note**

Tablets should have the latest drivers installed to obtain the latest fixes to known issues.

### Configuration Requirements

- A maximum of two tablets can be connected to the Zero Client operating in local tablet mode. Additional tablets must be bridged.
- On multi-monitor workstations the tablet is mapped to the entire desktop by default. If a tablet is mapped to a single display on a multi-monitor workstation, configure both the Zero Client tablet mapping setting and the host tablet mapping setting. Use the Zero Client OSD User Setting > Tablet Mapping screen to map the tablet to a single display. Change the host tablet mapping setting by configuring the `xsetwacom MapToOutput` setting. The local and remote cursors will not be in sync if the Zero Client and host settings are not configured properly.
- In bridged mode (local tablet driver is disabled), you must map the tablet(s) to display(s) with the `xsetwacom MapToOutput` command for a Zero Client connected tablet as you would for a tablet connected directly to the PC.
- To operate the tablet in left-handed orientation, you must configure both the Zero Client Left Handed Orientation setting and the host tablet Rotate setting. Use the Zero Client OSD User Setting > Tablet Mapping screen to configure the Left Handed Orientation setting. Change the host tablet orientation setting by configuring the `xsetwacom Rotate` setting. The local and remote cursors will not be in sync if the Zero Client and host settings are not configured properly.

## Supported Tablets

This release of Remote Workstation Card Software for Linux supports the following Wacom tablets when connected to PCoIP Zero Clients. Unsupported tablets will be bridged to the host workstation.

### Software Client USB support

USB devices connected to PCoIP Software Client hosts are not supported when connecting to Remote Workstation Cards or Remote Workstation Card Agents.

#### SUPPORTED TABLETS THAT USE ABSOLUTE CO-ORDINATES WHILE IN-SESSION AND IN THE OSD

Description	Model	Product ID
Intuos Pro Medium	PTH-660	0x0357
Intuos Pro Large	PTH-860	0x0358

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SUPPORTED TABLETS THAT USE ABSOLUTE CO-ORDINATES WHILE IN-SESSION AND RELATIVE CO-ORDINATES WHILE IN THE OSD

Review  
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Description	Model	Product ID
Cintiq	DTK-2241	0x0057
Cintiq	DTH-2242	0x0059
Cintiq 12WX	DTZ-1201W	0x00C6
Cintiq 13HD	DTH-1300	0x0304
Cintiq 13HD touch	DTK-1300	0x0333
Cintiq 20WSX		0x00C5
Cintiq 21UX	DTZ-2100	0x003F
Cintiq 21UX2	DTK-2100	0x00CC
Cintiq 22HD	DTK-2200	0x00FA
Cintiq 22HDT	DTH-2200 (pen)	0x005B
Cintiq 24HD	DTK-2400	0x00F4
Cintiq 24HD touch	DTH-2400	0x00F8
Cintiq 27QHD	DTH-2400	0x032A
Cintiq 27QHD touch	DTH-2400	0x032A
Intuos3 4x5	PTZ-430	0x00B0
Intuos3 6x8	PTZ-630	0x00B1
Intuos3 9x12	PTZ-930	0X00B2
Intuos3 12x12	PTZ-1230	0X00B3
Intuos3 12x19	PTZ-1231W	0X00B4
Intuos3 6x11	PTZ-631W	0X00B5
Intuos3 4x6	PTZ-431W	0X00B7
Intuos4 4x6	PTK-440	0X00B8
Intuos4 6x9	PTK-640	0X00B9
Intuos4 8x13	PTK-840	0X00BA
Intuos4 12x19	PTK-1240	0X00BB
Intuos4 WL		0X00BC
Intuos5 touch S		0X0026
Intuos5 touch M		0X0027
Intuos5 touch L		0X0028
Intuos5 S		0X0029
Intuos5 M		0X002A
Intuos Pro S	PTH-451	0X0314
Intuos Pro M	PTH-651, PTH-651/S	0X0315
Intuos Pro L	PTH-851	0x0317
Intuos PT S		0x0302

Description	Model	Product ID
Intuos PT M		0x0303
Intuos S		0x030E
Intuos P M		0x0323

Review  
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## Glossary

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Glossary

Review  
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## Troubleshooting

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This topic tables some common issues and suggested solutions. If your problem is not listed, you can capture additional debug information by starting the Remote Workstation Card Software executable with the optional parameter `-11=4`, which enables debug logging (see [Remote Workstation Card Software Daemon Configuration Files](#) for configuration options).

Review  
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Item	Description	Solution
1	When a user logs in, this popup message appears: PCoIP Remote Workstation Card Software Error Could not start the agent. Another instance of the agent is already running or the last instance of the agent did not exit properly. Close the other instance or delete the file '/tmp/pcoip_hostsw.pid' and try again.	This occurs when a user's login script calls pcoip_agent or pcoip_starhostsw. The Remote Workstation Card Software daemon automatically starts the Remote Workstation Card Software executable, eliminating the need for users to start the program when they log in. Modify the user's login script so it does not call pcoip_agent or pcoip_starhostsw.
2	When connecting from a software client, the display is scaled strangely.	Add this line to Device section of /etc/X11/xorg.conf: Option "FlatPanelProperties" "Scaling = Native"
3	Client topology is not applied correctly.	Verify that the host Xserver can support the desired topology by setting it with display manager or command-line xrandr.
4	Client topology is not applied correctly, including: <ul style="list-style-type: none"> <li>• Not all client windows are enabled (one or more displays are blank).</li> <li>• The local cursor overlay is out of sync with the remote cursor.</li> <li>• Some or all display rotations are not applied.</li> <li>• The primary display specified by the client is not the actual primary display.</li> </ul>	<p>Possible solutions:</p> <ul style="list-style-type: none"> <li>• Restart Remote Workstation Card Software:</li> <li>• Right-click the PCoIP icon and select restart.</li> <li>• If the icon is not visible, from a terminal type "killall pcoip_agent".</li> <li>• Disconnect and reconnect the session.</li> <li>• Restart X windows to terminate all running applications:</li> <li>• Log out and log in again.</li> <li>• Press Ctrl-Alt-Backspace.</li> </ul>
5	Incorrect topology applied after connecting or disconnecting (hot plug) Zero Client monitors while a session is active.	The current Remote Workstation Card Software does not support hot-plugging Zero Client monitors while a session is active. Resolution: Disconnect and restart the PCoIP session.
6	When the login screen is active on multi-monitor systems, the primary display specified by the client topology settings might not be the actual primary display.	The Linux login screen sometimes doesn't correctly process dynamic topology updates. Resolution: Restart the X server by pressing Ctrl-Alt-Backspace.
7	The pcoip_agent application does not start.	Delete the lock file /tmp/pcoiphostsw.pid if it exists and start the UI application.
8	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 Remote Workstation Card Software does not support local cursor on rotated displays: <ul style="list-style-type: none"> <li>• If xrandr version 1.1 or lower is installed on the workstation.</li> <li>• The "-notopo" option is specified when the createRPM script runs.</li> </ul> Resolution: Do not rotate any displays or use a workstation with xrandr version 1.2 or greater with the "-notopo" option when running the createRPM script.
9	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 Remote Workstation Card Software supports only the left, middle, right, forwards, and backwards mouse buttons and horizontal scroll wheel in local cursor mode.
10	A session is active with a soft client and the Local Cursor and Keyboard feature is not enabled at the login screen after the host workstation finishes booting.	By default, the Remote Workstation Card Software daemon enables the Local Cursor and Keyboard feature when the login screen is active and a session is active with a soft client. Resolution: Verify the daemon configuration file /etc/pcoiphostswd.conf does not exist. If the file exists, verify the daemon is enabled.
11	The local cursor speed is different from the X Windows cursor speed.	The local cursor does not use X Window's pointer speed or 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.
12	The Enable Local Cursor and Keyboard checkbox is grayed out.	System configuration may not meet requirements. See "Requirements for Local Cursor and Keyboard".

Item	Description	Solution
13	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. Resolution: Delay starting the PCoIP UI by modifying the daemon Host SW Login Start Delay.
14	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. Resolution: Ensure all active host displays are connected to a single client.
15	The Remote Workstation Card Software does not work in host systems with multiple PCoIP Remote Workstation Cards.	The current Remote Workstation Card Software does not work in systems with more than one PCoIP Remote Workstation Card.
16	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.
17	The pcoip_host.kokernel 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 look for startup errors and verify pcoip_host loads.
18	The Local Cursor and Keyboard feature does not support entering and exiting low power modes (hibernate and standby). This feature may stop working on systems that exit low power state.	Users wishing to put the workstation in a low power state should shut down/restart the workstation after exiting a low-power state.
19	Key presses on the keyboard are dropped when the Local Cursor and Keyboard and Client Keyboard Repeat Detection features are enabled, the latency of the PCoIP session exceeds 60 ms and the keyboard is connected behind a USB hub.	Resolution: Connect the keyboard directly to the Zero Client and ensure only HID devices (keyboard and mouse) are connected to the USB hub.
20	When the mouse is connected to the Zero Client behind a USB hub and Local Cursor and Keyboard is enabled: <ul style="list-style-type: none"> <li>• If remote cursor synchronization is also enabled, the local cursor movement is not smooth.</li> <li>• If remote cursor synchronization is disabled, the local cursor does not move.</li> </ul>	Resolution: Connect the mouse directly to a Zero Client USB root port and ensure only HID devices (keyboard and mouse) are connected to the USB hub. 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. See see Knowledge Base How to identify which USB port on my PCoIP Zero Client is behind an integrated/internal USB hub? on the support website.
21	The following error message appears when starting the pcoip_agent application: <code>Xlib: extension "RANDR" missing on display ":0.0".</code>	This has been observed on a CentOS 6.2 system while Xinerama is enabled. Resolution: Disable Xinerama or ignore the error message.
22	Both the remote and local cursors are visible when the Visible Cursor(s) option is Local.	Known Issues when Hiding the Remote Cursor describes known issues associated with hiding the remote cursor.
23	The Visible Cursor(s) dropdown menu does not include the Local option.	Known Issues when Hiding the Remote Cursor describes known issues associated with hiding the remote cursor.
24	The local and remote cursors are not in sync or the cursor movement does not match mouse movement.	Typically the Linux distribution requires changes to the X Windows xorg.conf file. For details, see step 5 in section 3.4 "Installing PCoIP Remote Workstation Card Software Binary RPM". This might happen if TwinView is enabled on the workstation and the <code>-t</code> command line option is not specified when starting the Remote Workstation Card Software executable. This might also happen on multi-monitor workstations with Xinerama enabled running CentOS 6.3 and version 310.19 of the

Item	Description	Solution
		<p>nVIDIA driver.</p> <p>Resolution: Add the <code>-t</code> option to the <code>HostSWOptions</code> setting in the daemon configuration file and restart the Remote Workstation Card Software.</p>
25	<p>The local and remote cursors are not in sync, or the cursor movement does not match mouse movement after changing the number of active monitors or the display resolution settings while logged in, or the monitor(s) is blank after connecting to a workstation.</p>	<p>Resolution: Log off and log on again or press <code>Ctrl-Alt-Backspace</code>. Both actions restart the X server and may fix the problem.</p>
26	<p>The workstation is not locked after a PCoIP session ends while a user is logged in and the Lock host PC upon session termination feature is enabled.</p>	<p>The Remote Workstation Card Software calls the <code>pcoip_lockscreen</code> script to lock the screen. For details on the location of the script, see "Installing PCoIP Remote Workstation Card Software Binary RPM".</p> <p>Resolution: Modify the script to lock the screen.</p>
27	<p>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>	<p>Most likely the graphics card has enabled temporal dithering. For details on temporal dithering, see "PCoIP Remote Workstation Card Software Installation".</p>
28	<p>The UI closes after clicking Apply on the UI Monitor tab.</p>	<p>This is a known problem that will be investigated in the future.</p> <p>Resolution: Re-open the UI after clicking Apply.</p>
29	<p>The PCoIP UI icon appears as a vertical bar instead of the PCoIP icon in the system tray.</p>	<p>This is a known problem that will be investigated in the future.</p> <p>Resolution: Right-click the UI and select Restart Host SW or kill the <code>pcoip_agent</code> process by typing <code>killall pcoip_agent</code>.</p>
30	<p>Sometimes the client displays an arrow cursor shape with an "L" in it when Local Cursor and Keyboard is enabled and the Local cursor is visible.</p>	<p>See "Known Issues When Hiding the Remote Cursor" for scenarios that might cause this. This 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.</p>

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## Known Issues When Hiding the Remote Cursor

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When the local cursor and keyboard feature is enabled, users must configure the Visible Cursor(s) option. When this option is set to Local, the Remote Workstation Card Software hides the remote cursor. Some problems users may observe when the remote cursor is hidden include:

- 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.
- 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.
- Workstations with multiple monitors that enable Xinerama, see that 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.
- The Remote Workstation Card Software hides the remote cursor using API found in version 4 or later of the `xfixes` package. The Remote Workstation Card Software cannot hide the host cursor if version 4 or later of this package is not installed. The Remote Workstation Card 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).

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## Known Issues When Using Local Tablet Driver

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This section describes some problems users may observe while using the local tablet driver.

### IF THE TABLET STYLUS OR MOUSE IS TOO CLOSE TO THE TABLET UNDER SPECIFIC CONDITIONS, MOVE THE TABLET STYLUS OR MOUSE AWAY FROM THE TABLET FOR IT TO WORK:

- If the state of the Local Tablet Driver feature is changed.
- If the Local Tablet Driver feature is enabled when the session starts.

### THE TABLET MUST BE CONFIGURED TO OPERATE IN ABSOLUTE MODE.

#### THE TABLET MOUSE OPERATES IN RELATIVE MODE:

- When a session starts.
- When a tablet is connected to a Zero Client.
- When the Local Tablet Driver feature is enabled.

To work around this, use the `xsetwacom` utility to change the mode of the Pen Cursor device from Absolute to Relative and then back to Absolute. You must do this each time the tablet is connected, when a session starts, and when the Local Tablet Driver feature is enabled.

### CINTIQ 22HD EXTERNAL USB PORT DOES NOT WORK



#### Some external USB ports do not work

Some tablets, such as the Cintiq 22HD, include a built-in USB hub and provide a USB port for an external USB device. If a non-HID USB device is connected to the tablet USB port, the tablet and the device are bridged to the host and the Zero Client's local tablet driver does not control the tablet. To work around this, do not connect non-HID USB devices to the tablet USB port.