



HP ZCentral Remote Boost User Guide

SUMMARY

HP ZCentral Remote Boost brings added security, performance, mobility, and collaboration to your workstation deployment. With HP ZCentral Remote Boost, you can use a lower-powered desktop, notebook, or thin client to remotely connect to a powerful workstation and use your graphics-intensive workstation programs wherever you go.

Legal information

Copyright and License

© Copyright 2020–2022 HP Development Company, L.P.

Confidential computer software. Valid license from HP required for possession, use or copying. Consistent with FAR 12.211 and 12.212, Commercial Computer Software, Computer Software Documentation, and Technical Data for Commercial Items are licensed to the U.S. Government under vendor's standard commercial license.

The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

Seventh Edition: March 2022

First Edition: February 2020

Document Part Number: L85268-007

Trademark Credits

Citrix®, the Citrix logo, and other marks appearing herein are trademarks of Citrix Systems, Inc., and/or one or more of its subsidiaries, and may be registered in the United States Patent and Trademark Office and in other countries. macOS is a trademark of Apple Inc. Linux® is the registered trademark of Linus Torvalds in the U.S. and other countries. Microsoft and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. NVIDIA and Quadro are trademarks and/or registered trademarks of NVIDIA Corporation in the U.S. and other countries. Red Hat and Red Hat Enterprise Linux are trademarks of Red Hat, Inc. in the United States and other countries. VMware and VMware vSphere are registered trademarks or trademarks of VMware, Inc. in the United States and/or other jurisdictions. DisplayPort™ and the DisplayPort™ logo are trademarks owned by the Video Electronics Standards Association (VESA®) in the United States and other countries.

Third-party software notice

Third-party source code and licenses are redistributed, if required, with HP ZCentral Remote Boost.

User input syntax key

Text that you must enter into a user interface is indicated by `fixed-width font`.

Table User input syntax key

Item	Description
<code>Text without brackets or braces</code>	Items you must type exactly as shown
<code><Text inside angle brackets></code>	A placeholder for a value you must provide; omit the brackets
<code>[Text inside square brackets]</code>	Optional items; omit the brackets
<code>{Text inside braces}</code>	A set of items from which you must choose only one; omit the braces
<code> </code>	A separator for items from which you must choose only one; omit the vertical bar
<code>...</code>	Items that can or must repeat; omit the ellipsis

Table of contents

1 HP ZCentral Remote Boost overview	1
Features	2
Interoperability between different versions of HP ZCentral Remote Boost.....	3
Software compatibility with HP ZCentral Remote Boost	4
HP ZCentral Remote Boost Sender licensing.....	4
Finding more information.....	4
2 Getting started	6
3 Installation	7
Installing HP ZCentral Remote Boost Receiver (Windows)	7
Performing a custom HP ZCentral Remote Boost Receiver installation using the installer wizard.....	7
Performing a custom HP ZCentral Remote Boost Receiver installation on the command line.....	8
Installing HP ZCentral Remote Boost Sender (Windows).....	10
Installer wizard installation.....	10
Command-line installation	11
Installing HP ZCentral Remote Boost Receiver (Linux)	13
RHEL and Ubuntu	13
HP ThinPro	14
Installing HP ZCentral Remote Boost Sender (Linux).....	14
Installing HP ZCentral Remote Boost Receiver (macOS).....	15
Installer wizard installation.....	15
Command-line installation.....	15
4 HP ZCentral Remote Boost Receiver overview	16
Opening HP ZCentral Remote Boost Receiver	16
Opening HP ZCentral Remote Boost Receiver on Windows	16
Opening HP ZCentral Remote Boost Receiver on Linux	16
Opening HP ZCentral Remote Boost Receiver on macOS.....	16
HP ZCentral Remote Boost Receiver GUI (Windows/Linux).....	16
HP ZCentral Remote Boost Receiver GUI (macOS)	17
Starting an HP ZCentral Remote Boost session	18
HP ZCentral Remote Boost Receiver window GUI (Windows/Linux)	18
HP ZCentral Remote Boost Receiver toolbar GUI (Windows/Linux).....	19
HP ZCentral Remote Boost Receiver window GUI (macOS).....	20
Setup Mode	22
Changing the Setup Mode hotkey sequence	22
HP ZCentral Remote Boost Receiver settings	23
Connection	23

Performance	24
Gestures (Windows touch-capable devices only).....	24
Mapping a hotkey sequence to a gesture	25
Unmapping a hotkey sequence from a gesture	25
Audio	25
Network.....	25
Hotkeys	26
Logging	27
Statistics (Windows/Linux only)	27
HP ZCentral Remote Boost Receiver command-line options.....	27
5 HP ZCentral Remote Boost Sender overview	29
HP ZCentral Remote Boost Sender overview (Windows)	29
HP ZCentral Remote Boost Sender overview (Linux)	29
HP ZCentral Remote Boost Sender command-line options (Windows)	30
HP ZCentral Remote Boost Sender command-line options (Linux)	30
HP ZCentral Remote Boost Sender notification icon (Windows only)	31
HP ZCentral Remote Boost Sender event logging (Windows only)	31
Filtering access to HP ZCentral Remote Boost Senders	31
Filtering by user name	31
Filtering by network identifiers	32
6 Using a certificate signed by a Certificate Authority (CA)	33
Configuring the sender to use a signed certificate.....	33
Configuring the sender to use a file-based certificate	33
Configuring file-based certificates by modifying the rgsenderconfig file	33
Configuring file-based certificates using the sender configuration tool	34
Configuring file-based intermediate CAs.....	35
Configuring the sender to use a certificate from the store (Windows only)	36
Configuring certificates from the certificate store by modifying the rgsenderconfig file	36
Configure certificates from the certificates store using the sender configuration tool	37
Configuring intermediate CAs from the certificate store	38
Configuring the receiver to accept a sender certificate signed by a CA	39
Configuring the receiver to look for CAs in the certificate store	39
Configuring the receiver to look for CAs in a CA file	40
Other receiver properties related to certificate validation	40
Adding Certificates to the certificate store.....	41
Adding sender certificates and CAs to the Windows certificate store	41
Adding CAs to the Linux Certificate Store	42
Ubuntu.....	42
CentOS 7 or RHEL 7	42
ThinPro	42
Adding CAs to the macOS Certificate Store.....	42
Accepting or rejecting certificate errors	44
Fatal certificate errors	45
Removing cached certificates.....	45

Windows.....	45
Linux.....	45
macOS	45
Troubleshooting the certificate configuration	46
7 Using HP ZCentral Remote Boost features.....	47
HP ZCentral Remote Boost Advanced Features	47
Advanced Video Compression.....	47
AVC activation	47
HP Velocity	48
Authentication	48
Authentication methods.....	48
Standard authentication.....	48
Using Kerberos Authentication.....	49
Easy Login	49
Single Sign-on.....	49
Smart card redirection.....	49
Using smart card redirection	50
Configuring Remote USB for smart card redirection.....	50
Limitations	50
Collaboration	50
Collaboration invitations	52
Active Collaboration Notification.....	52
Display.....	52
Display resolution and layout matching.....	53
Multi-monitor overview	53
Matching display resolution and layout methods.....	53
Matching display resolution and layout (Windows-based sender).....	55
Testing the resolution.....	55
Additional configuration on the sender.....	55
NVIDIA resolution-matching (Windows-based senders with NVIDIA graphics only).....	56
EDID files	56
Creating and applying an EDID file.....	56
Adding custom resolutions	57
Matching display resolution and layout (Linux-based sender).....	58
Configuring the X server	58
Creating an EDID file.....	59
Using display properties to set resolution and layout	60
Sender screen blanking	61
Input.....	61
Wacom solution	62
Adjusting tablet properties.....	62
Windows and macOS receiver solution	62
ThinPro receiver Solution	62
Linux receiver solution (non-ThinPro)	62
Windows sender solution	62
Linux sender solution	63

Using touch features (Windows touch-capable devices only)	63
Game Mode	64
Supported keyboard layouts	64
Remote Audio.....	65
HP ZCentral Remote Boost audio path	65
Using Remote Audio (Windows-based sender)	66
Using Remote Audio (Linux-based sender)	66
PulseAudio	66
ALSA	66
Remote Microphone (Linux senders only)	68
HP ZCentral Remote Boost mic path	68
Using Remote Microphone.....	68
PulseAudio	68
Remote Clipboard	69
Remote USB (Windows and ThinPro only).....	69
Configuring the remoting behavior of individual USB devices (Windows only).....	69
USB audio	70
Remote USB Access Control List	71
Determining USB device information (Windows)	72
Determining USB device information (Linux)	73
Enabling Remote USB on HP ThinPro	73
Directory Mode.....	73
Directory file format	74
Starting HP ZCentral Remote Boost Receiver in Directory Mode (Windows).....	74
Verifying the HP ZCentral Remote Boost connection.....	74
Bringing a specific HP ZCentral Remote Boost Receiver window to the front	75
Starting HP ZCentral Remote Boost Receiver in Directory Mode (macOS)	75
8 Configuration tools and properties	76
HP ZCentral Remote Boost Receiver setting override hierarchy	76
HP ZCentral Remote Boost Receiver Configuration tool (Windows and Linux Only)	76
Using the HP ZCentral Remote Boost Receiver Configuration tool.....	76
General.....	77
Image and Display.....	79
Audio	81
Network (Receiver)	81
HP Velocity	83
USB (Windows / ThinPro only)	83
Hotkeys	83
Logging	84
Activation	85
HP ZCentral Remote Boost Sender setting override hierarchy.....	86
HP ZCentral Remote Boost Sender Configuration tool (Windows/Linux only)	86
Using the HP ZCentral Remote Boost Sender Configuration tool	86
General.....	87
Authentication (Windows only)	88

Image and Display.....	88
Network (Sender).....	89
HP Velocity.....	90
USB.....	91
Collaboration.....	91
Logging.....	92
Diagnostics.....	93
Certificate.....	93
Setting HP ZCentral Remote Boost properties manually.....	93
Property syntax.....	94
Setting property values in a configuration file.....	94
Setting property values on the command line.....	94
Making a property immutable.....	95
Automation API restriction control.....	95
Other properties.....	95
Other global properties.....	96
Per-session properties (HP ZCentral Remote Boost Receiver only).....	99
Window location and size properties (per-session).....	99
Clipboard properties (per-session).....	100
Auto-launch properties.....	100
9 Troubleshooting.....	103
Failed connection attempts.....	103
Receiver checklist.....	103
Sender checklist.....	103
Kerberos.....	104
Sender network interface binding.....	104
Reconfiguring network interface binding manually.....	105
Reconfiguring network interface binding using the HP ZCentral Remote Boost Sender Configuration tool.....	105
Determining the number that corresponds to the network interface.....	105
Configuring the HP ZCentral Remote Boost Sender settings.....	106
Network timeouts.....	106
The HP ZCentral Remote Boost Receiver window repeatedly dims and displays a connection warning message.....	106
The HP ZCentral Remote Boost Receiver window dims, and HP ZCentral Remote Boost Receiver disconnects and displays a connection error, but you can connect again immediately.....	106
When connecting to a Linux-based sender, the PAM authentication dialog on the receiver does not display long enough for credentials to be entered.....	107
When connecting to the sender, the authorization dialog is not displayed long enough for the user to respond to it.....	107
The HP ZCentral Remote Boost Receiver window is not updating.....	107
Increasing the error timeout value of HP ZCentral Remote Boost Receiver does not appear to have an effect, and HP ZCentral Remote Boost Receiver still disconnects.....	107
Graphical issues (Linux).....	107
Full-screen crosshair cursors.....	108
Gamma correction on the receiver.....	108
Black or blank HP ZCentral Remote Boost Receiver window.....	108

High DPI display issues	108
Disabling or enabling support for high DPI displays	108
Input issues	109
Keystrokes are repeated when connected to Linux Sender	109
Remote Audio issues	109
HP ZCentral Remote Boost Receiver is not producing audio	109
Audio is disrupted	110
There is no audio on a sender or a receiver with multiple audio devices	111
Remote USB issues	111
Smart card redirection issues	112
Mouse Cursor issues on servers and blades (Windows Sender)	112
A Switching between HP ZCentral Remote Boost and Remote Desktop Connection (Windows only)	113
B Creating an agent for remote application termination (Windows only)	114
Viewing the HPRemote log	114
HPRemote log format	114
Agent design guidelines	118
Desktop session logout	118
Selective environment shutdown	118
Wrapping applications of interest	119
Administrator alerts	119
Anticipating user disconnects and reconnects	119
General agent design guidelines	119
Recovery settings for the HP ZCentral Remote Boost Sender service	120
Sample agent	120
C Uninstalling HP ZCentral Remote Boost	126
Uninstalling HP ZCentral Remote Boost Receiver or HP ZCentral Remote Boost Sender (Windows)	126
Uninstalling HP ZCentral Remote Boost Receiver (Linux)	126
Red Hat Enterprise Linux	126
Ubuntu	126
HP ThinPro	126
Uninstalling HP ZCentral Remote Boost Sender (Linux)	127
Red Hat Enterprise Linux	127
Ubuntu	127
Uninstalling HP ZCentral Remote Boost Receiver (macOS)	128
Index	129

1 HP ZCentral Remote Boost overview

HP ZCentral Remote Boost brings added security, performance, mobility, and collaboration to your workstation deployment. With HP ZCentral Remote Boost, you can use a lower-powered desktop, notebook, or thin client to remotely connect to a powerful workstation and use your graphics-intensive workstation programs wherever you go.

Your programs run natively on the remote workstation and take full advantage of its graphics resources. The desktop of the remote workstation is transmitted over a standard network to your local computer using advanced image compression technology specifically designed for digital imagery, text, and high frame rate video applications.

The following image and table demonstrate a typical HP ZCentral Remote Boost deployment.

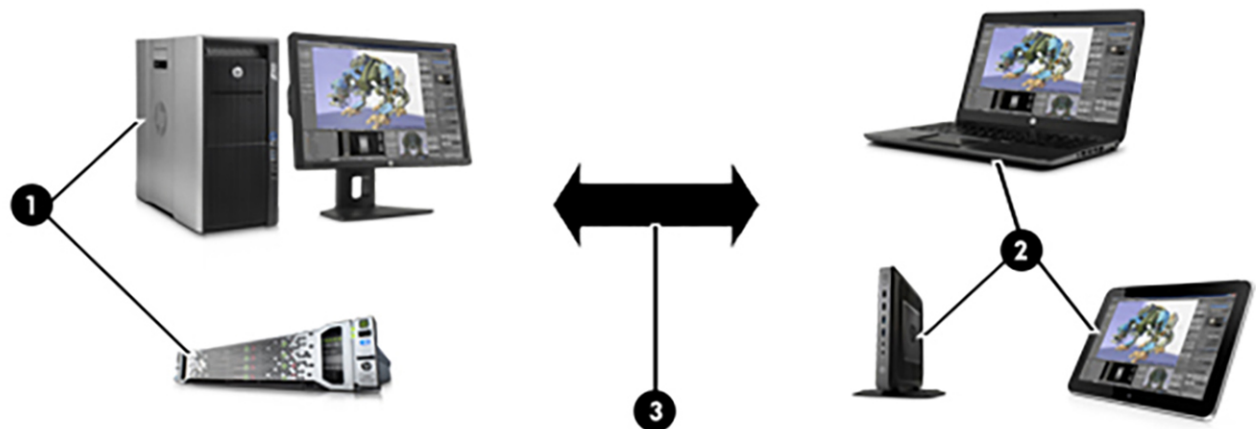


Table 1-1 HP ZCentral Remote Boost deployment components

Item	Description
1	<p>The sender is typically a high-performance workstation, virtual workstation, blade, or server that hosts your software. HP ZCentral Remote Boost Sender is installed on the sender and transmits graphics, audio, and USB data to the receiver. The sender receives input and USB data from the receiver.</p> <p>NOTE: A monitor does not necessarily have to be connected to the sender.</p>
2	<p>The receiver is typically a desktop, notebook, tablet, or thin client with HP ZCentral Remote Boost Receiver installed. You establish the Remote Boost connection from the receiver side. The desktop of the sender is displayed inside the HP ZCentral Remote Boost Receiver window on the receiver, and Remote Boost Receiver transmits input to the sender so that you can interact with your programs remotely.</p>
3	<p>A TCP/IP network serves as the communication link between the sender and the receiver.</p> <p>The sender and receiver must be on the same network or accessible with a VPN for a Remote Boost connection to be established between them. The default TCP port used by the sender and receiver is 42966. You can configure the port using the sender and receiver configuration tools. See Network (Receiver) on page 81 and Network (Sender) on page 89.</p> <p>NOTE: To use HP Velocity, both TCP and UDP must be enabled on port 42966.</p>



NOTE: HP ZCentral Remote Boost software and documentation might also refer to the sender and the receiver as the remote computer and the local computer respectively.

HP ZCentral Remote Boost system requirements, such as hardware and operating system support, are not described in this document. Some HP ZCentral Remote Boost features might have additional system requirements. System requirements are described in the *QuickSpecs* (see [Finding more information on page 4](#)).

Features

HP ZCentral Remote Boost includes a variety of features, including the ones described in the following table.

NOTICE: Some features are not supported by certain operating systems.

Table 1-2 HP ZCentral Remote Boost features and their descriptions

Feature	Description
3D graphics API support	Provides workstation-class performance for software based on OpenGL or Direct X NOTICE: See Software compatibility with HP ZCentral Remote Boost on page 4 for information about the types of programs and configurations that HP does and does not recommend for use with HP ZCentral Remote Boost.
Advanced Video Compression	Reduces the network bandwidth needed for high-quality video streams See Advanced Video Compression on page 47 for more information.
Authentication methods	Support varied deployment scenarios and preferences, including smart card redirection See Authentication on page 48 for more information.
Active Collaboration Notification	Highlights all screens that are viewed by connected receivers during an active collaboration session. This feature indicates that your screens are currently being viewed by other collaborators. See Active Collaboration Notification on page 52 for more information.
Collaboration	Lets multiple receivers connect to the same sender simultaneously, allowing multiple users to view and interact with the same desktop session and programs See Collaboration on page 50 for more information.
Directory Mode	Lets a single receiver connect to multiple senders simultaneously See Directory Mode on page 73 for more information.
Display resolution and layout matching	Adjusts the display resolution and display layout of the sender to match those of the receiver or user-defined properties, even when you use multiple monitors See Display resolution and layout matching on page 53 for more information.
HP Velocity	Improves performance within a wide area network (WAN) See HP Velocity on page 48 for more information.
Pixel Mode	Enables you to view the remote desktop in two different ways. 1:1 mode displays the remote desktop as is. Scaled mode scales the remote desktop up or down to fill the HP ZCentral Remote Boost Receiver window.
Remote Audio	Transmits smooth, continuous, low-latency, high-quality audio from the sender to the receiver See Remote Audio on page 65 for more information.

Table 1-2 HP ZCentral Remote Boost features and their descriptions (continued)

Feature	Description
Remote Clipboard	Lets you cut, copy, and paste data between the sender and the receiver or between two senders See Remote Clipboard on page 69 for more information.
Remote USB (Windows/ThinPro only)	Lets receiver-side USB devices be mounted to and accessed by the sender through the HP ZCentral Remote Boost connection See Remote USB (Windows and ThinPro only) on page 69 for more information.
Sender screen blanking	Blanks the screen of the sender monitor (if one is connected) so that the desktop session is not visible on the sender monitor See Sender screen blanking on page 61 for more information.
Touch features (Windows only)	Lets you control your remote desktop with touch input and configure custom gestures See Using touch features (Windows touch-capable devices only) on page 63 for more information.


Interoperability between different versions of HP ZCentral Remote Boost


Interoperability is supported between different versions of HP ZCentral Remote Boost Sender and HP ZCentral Remote Boost Receiver only if they have the same primary version number.



Table 1-3 HP ZCentral Remote Boost version number items and their descriptions

Item	Description
1	Primary version number: A primary release typically contains upgrades and changes significant enough that interoperability with previous primary releases is not guaranteed by HP. For example, a connection between different primary releases of HP ZCentral Remote Boost Sender and HP ZCentral Remote Boost Receiver might not function at an acceptable level of quality, or at all.
2	Minor version number: When this number is zero, it represents a minor release, which typically introduces new features or enhances existing functionality, as well as including changes from any previous patch releases. A connection between different minor releases (but the same primary release) of HP ZCentral Remote Boost Sender and HP ZCentral Remote Boost Receiver should function at an acceptable level of quality.
3	Patch version number: When this number is zero, it represents a patch release, which typically fixes only major security issues or defects. A connection between different patch releases (but the same primary release) of HP ZCentral Remote Boost Sender and HP ZCentral Remote Boost Receiver should function at an acceptable level of quality.

 **NOTE:** Each release of HP ZCentral Remote Boost is a complete release of the entire product, regardless of which components changed.

 **NOTE:** The version numbering changed between HP Remote Graphics Software (RGS) and HP ZCentral Remote Boost. The last version of RGS is 7.7.x, and the first version of Remote Boost is 20.0.

Software compatibility with HP ZCentral Remote Boost

HP ZCentral Remote Boost works with most software that runs in windowed mode, including those based on OpenGL and Direct X. Some exceptions include:

- The installation of HP ZCentral Remote Boost Sender disables video overlay surfaces on the sender. Most OpenGL-based software will adjust to this and still work correctly, but in some cases, the following could happen as a result:
 - Some OpenGL-based software might display incorrectly.
 - Media players that use video overlay surfaces might display incorrectly.


If these types of issues occur, likely the software is still trying to use video overlay surfaces even though they are disabled. You can sometimes resolve this issue if the software has an option to disable the use of video overlay surfaces.


NOTICE: HP ZCentral Remote Boost Sender does not support programs in full-screen exclusive mode. This means that HP ZCentral Remote Boost is not suitable for most full-screen games.

HP ZCentral Remote Boost Sender licensing

HP ZCentral Remote Boost Sender includes a free license for use on HP Z workstations, HP ZBook Mobile Workstations, and HP VR Backpack workstations. This license is valid until 1 January 2023. After that date you need a separate license purchase for the HP ZCentral Remote Boost Sender on these products.

HP ZCentral Remote Boost Sender requires a license if installed on any other computer. Further information can be found in the *Licensing Guide* (see [Finding more information on page 4](#)).

 **NOTE:** An HP ZCentral Remote Boost connection requires a valid license. Be sure that the Sender is correctly configured with a valid license. For more information and troubleshooting tips, see [Finding more information on page 4](#) in the *Licensing Guide*.

 **NOTE:** HP ZCentral Remote Boost Receiver is a free download for all devices.

Finding more information

Use the following table to find more information about HP ZCentral Remote Boost.

Table 1-4 Resources and their contents

Resource	Contents
HP ZCentral Remote Boost website http://hp.com/ZCentralRemoteBoost	<ul style="list-style-type: none">• Select More Resources at the bottom of the Remote Boost website for more Remote Boost documentation, including the following guides:<ul style="list-style-type: none">– <i>Licensing Guide</i>—Describes license types and how to install licensing for the HP ZCentral Remote Boost Sender.

Table 1-4 Resources and their contents (continued)

Resource	Contents
	<ul style="list-style-type: none"><li data-bbox="691 254 1382 279">– <i>QuickSpecs</i>—Describes HP ZCentral Remote Boost system requirements.<li data-bbox="691 302 1461 352">– <i>ZCentral Remote Boost Configuration Guide</i>—Provides information on configuring HP ZCentral Remote Boost for optimum performance.
HP ZCentral Remote Boost at HP Support Center http://www.hp.com/support/rgs	<ul style="list-style-type: none"><li data-bbox="647 380 1394 430">• User guides for some previous versions of HP ZCentral Remote Boost. Select HP ZCentral Remote Boost.<li data-bbox="647 453 863 478">• Worldwide support<ul style="list-style-type: none"><li data-bbox="691 501 1034 527">– Online chat with an HP technician<li data-bbox="691 550 991 575">– Support telephone numbers <p data-bbox="740 598 1453 648">NOTE: If your phone call is answered by a voice recognition system and you are asked to say the name of the product, say "ZCentral Remote Boost."</p>

2 Getting started

The following procedure is a high-level description of how to get started using HP ZCentral Remote Boost:

1. Install HP ZCentral Remote Boost Sender and HP ZCentral Remote Boost Receiver.
2. Open HP ZCentral Remote Boost Receiver.
3. Start an HP ZCentral Remote Boost session with the sender.
 - a. On the **Home** panel of HP ZCentral Remote Boost Receiver, enter the host name or IP address of the sender, and then press the **Enter** key or select the **Connect** button.
 - b. In the HP ZCentral Remote Boost authentication window that appears, enter the credentials of a user account that resides on the sender, and then select **OK**.


If authentication is successful, the HP ZCentral Remote Boost session starts, and the sender desktop appears inside the HP ZCentral Remote Boost Receiver window that opens on the receiver.



NOTE: If the sender desktop was in a locked state when you started the HP ZCentral Remote Boost session, you must unlock the desktop by entering the credentials again, this time into the logon screen on the sender.

3 Installation

Follow the installation instructions for your operating system.


 **NOTE:** Although RGS has a new name, HP ZCentral Remote Boost, the installation parameter names, folders and executable names have not changed.


Installing HP ZCentral Remote Boost Receiver (Windows)

The installer wizard for the HP ZCentral Remote Boost Receiver allows for both Typical and Custom installations. The Typical installation installs Remote USB and Remote Clipboard. The Typical installation should be suitable for most deployments.

The Custom installation type lets you choose whether you want to install certain features, as well as specify proxy settings. You can perform a custom installation on the command line as well.

 **IMPORTANT:** Windows administrator privileges are required to perform the installation.

 **NOTE:** If the software is already installed, installing a newer version will perform an update. Attempting to install the same version or an older version will cause the installer to exit without making changes to the system.

 **NOTE:** During the installation process, the installer creates a log file named `rgreceiverInstaller.log` in the location specified by the Windows `TEMP` environment variable.


Performing a custom HP ZCentral Remote Boost Receiver installation using the installer wizard

To perform a custom installation of HP ZCentral Remote Boost Receiver on Windows using the installer wizard:

1. Run `ReceiverSetup64.exe`, follow the on-screen instructions until you are prompted to choose a setup type, select **Custom**, and then select **Next**.
2. On the **Remote USB Configuration** page, select the appropriate installation setting for the Remote USB feature from the following options, and then select **Next**.
 - **USB devices are Local**—Remote USB is not installed on the receiver, and all receiver-side USB devices always mount to the receiver only, even during an HP ZCentral Remote Boost session.
 - **USB devices are Remote**—Remote USB is installed, and all receiver-side USB devices always mount to the sender only, which means the USB devices are accessible only during an HP ZCentral Remote Boost session. The USB devices cannot mount to the receiver at any time, regardless of the HP ZCentral Remote Boost connection state.
 - **USB devices are Local/Remote**—Remote USB is installed, and each USB device has its access set individually to either the receiver or the sender, depending on when the USB device is plugged in to the receiver.
 - If a USB device is plugged in to a USB port on the receiver while HP ZCentral Remote Boost Receiver is disconnected, the USB device becomes accessible by the receiver only.


- If a USB device is plugged in to a USB port on the receiver while HP ZCentral Remote Boost Receiver is connected, the USB device becomes accessible by the sender only.

You can switch access to a particular device by removing it and then re-inserting it while the HP ZCentral Remote Boost Receiver is in the opposite connection state.


 **NOTE:** This setting controls whether Remote USB components are *installed*. To change this setting after installation, you must uninstall and reinstall HP ZCentral Remote Boost Receiver. If installed, Remote USB can be *disabled* (and re-enabled) later using HP ZCentral Remote Boost Receiver or the HP ZCentral Remote Boost Receiver Configuration tool.

Alternatively, you can override the Remote USB installation setting for individual devices (without a reinstallation) with an advanced option that the installer does not offer (see [Configuring the remoting behavior of individual USB devices \(Windows only\) on page 69](#)).

3. On the **Remote Clipboard Configuration** page, select whether you want the Remote Clipboard feature installed, and then select **Next**.

 **NOTE:** This setting controls whether Remote Clipboard components are *installed*. To change this setting after installation, you must uninstall and reinstall HP ZCentral Remote Boost Receiver. If installed, Remote Clipboard can be *disabled* (and re-enabled) later using HP ZCentral Remote Boost Receiver or the HP ZCentral Remote Boost Receiver Configuration tool.

4. If the next page of the wizard is titled **Proxy Configuration**, select the appropriate setting from the following list, and then select **Next**. If the next page prompts you to start the installation next, then HP ZCentral Remote Boost automatically detected and used the proxy settings from Internet Explorer, and you can skip this step.
 - If the receiver accesses the internet through a proxy server, select **Use this proxy** and enter the proxy address and port.
 - If the receiver does not access the internet through a proxy server, leave **Do not use a proxy** selected.

 **IMPORTANT:** Proxy server settings must be configured correctly to activate HP ZCentral Remote Boost Advanced Features. See [HP ZCentral Remote Boost Advanced Features on page 47](#) for more information.

5. Select **Install** to start the installation process.
6. When prompted, restart the computer to complete the installation.


Performing a custom HP ZCentral Remote Boost Receiver installation on the command line

HP ZCentral Remote Boost command-line options must be preceded by a `/z` flag and be enclosed in double quotes, with no space before or after the opening double quote and no space before the closing double quote. If you use multiple commands, separate them with a single space. See the following example:

```
ReceiverSetup64.exe /z"/autoinstall /agreetolicense"
```

Silent installation (installing without an end-user interface) is available by using a `/s` flag along with `/z`. See the following example:


```
ReceiverSetup64.exe /s /z"/autoinstall /agreetolicense"
```

 **NOTE:** By default, the silent installation command will not wait for the installation to complete unless the `/clone_wait` flag is included. See the following example:

```
ReceiverSetup64.exe /clone_wait /s /z"/autoinstall /agreetolicense"
```

If you need to include a double quote as part of a parameter (such as for a folder path), then you should precede each of those double quotes with a backwards slash like in the following example:

```
ReceiverSetup64.exe /z"/autoinstall /agreetolicense /folder=\\\"C:\RGS  
Receiver\""
```

 **NOTE:** This command must be issued from the location of the `ReceiverSetup64.exe` installation file.

Unless a folder path is specified, HP ZCentral Remote Boost is installed in the folder: `C:\Program Files\HP\Remote Graphics Receiver`.

The following table describes the installation-related command-line options.


 **IMPORTANT:** The options `/autoinstall` and `/agreetolicense` are always required when performing the installation on the command line.

Table 3-1 Installation options and their descriptions

Option	Description
<code>/autoinstall</code>	Initiates the installation
<code>/agreetolicense</code>	Accepts the license agreement
<code>/folder=\\\"<folder path>\"</code>	Specifies the folder path to install to, which is the following by default if not specified: <code>C:\Program Files\HP\Remote Graphics Receiver</code> NOTE: The folder path <code>C:\Program Files\HP\Remote Graphics Receiver</code> applies to 64-bit versions of Windows. On 32-bit versions of Windows, the folder path is <code>C:\Program Files\Hewlett-Packard\Remote Graphics Receiver</code> .
<code>/usb={local remote localRemote}</code>	Sets the Remote USB installation option, which is <code>localRemote</code> by default if not specified For a description of each option, see Performing a custom HP ZCentral Remote Boost Receiver installation using the installer wizard on page 7 .
<code>/clipboard</code>	Installs the Remote Clipboard feature
<code>/noreboot</code>	Prevents the computer from restarting at the end of the installation process
<code>/proxy=<IP address>:<port></code>	Configures proxy settings to allow for activation of HP ZCentral Remote Boost Advanced Features. IMPORTANT: Activation of HP ZCentral Remote Boost Advanced Features does not work through a proxy server if the proxy settings are not configured

Table 3-1 Installation options and their descriptions (continued)

Option	Description
	correctly. See HP ZCentral Remote Boost Advanced Features on page 47 for more information.

The following table describes additional command-line options for the installer.


 **NOTE:** If either `/help` or `/viewlicense` is used, all other options are ignored.

Table 3-2 Installation options and their descriptions

Option	Description
<code>/help</code>	Displays the valid command line options
<code>/viewlicense</code>	Displays the EULA (End User License Agreement)
<code>/autoremove</code>	Initiates an uninstallation


NOTE: The option `/noreboot` can be used in conjunction with this option.


Installing HP ZCentral Remote Boost Sender (Windows)

The installer wizard for the HP ZCentral Remote Boost Sender allows for both Typical and Custom installations. The Typical installation installs Remote USB and Remote Clipboard but not smart card redirection. The Typical installation should be suitable for most deployments.

The Custom installation lets you choose whether or not to install certain features. A custom installation can be performed on the command line as well.


 **IMPORTANT:** Windows administrator privileges are required to perform the installation.

 **NOTE:** If an older version of the software is already installed, installing a newer version will perform an update. Attempting to install the same version or an older version will cause the installer to exit without making changes to the system.

 **NOTE:** During the installation process, the installer creates a log file named `rgsenderInstaller.log` in the location specified by the Windows `TEMP` environment variable.


Installer wizard installation

To perform a custom installation of HP ZCentral Remote Boost Sender on Windows using the installer wizard:


 **NOTE:** The installer wizard might contain additional options not discussed below regarding installation of beta features. Do not install these features unless instructed to by HP.


1. Run `SenderSetup64.exe`, follow the on-screen instructions until you are prompted to choose a setup type, select **Custom**, and then select **Next**.

2. On the **Remote Boost Sender Configuration** page, select whether you want the Remote USB, smart card redirection, and Remote Clipboard features installed, and then select **Next**.

 **NOTE:** These settings control whether the features are *installed*. To change these settings after installation, you must uninstall and reinstall HP ZCentral Remote Boost Sender. If installed, Remote Clipboard can be *disabled* (and re-enabled) later using the HP ZCentral Remote Boost Sender Configuration tool.

3. On the **Single Sign-On / Easy Login Configuration** page, select an authentication method, and then select **Next**.


 **TIP:** You can change the authentication method after installation. See [Authentication on page 48](#) for more information and for a description of each of the authentication methods.

 **NOTE:** If you select **Do not enable either**, then the standard authentication method will be used.

4. If the next page of the wizard is titled **Remote Boost Sender Licensing**, complete this step. If the next page prompts you to start the installation next, then an HP ZCentral Remote Boost Sender license is either already installed or is not required, and you can skip this step.

On the Remote Boost Sender Licensing page, select the appropriate option depending on if you have an HP ZCentral Remote Boost Sender license file ready to install, select **Next**.

If you chose to install a license file, follow the on-screen instructions to complete that procedure before proceeding to the next step.

 **NOTE:** For a brief overview of HP ZCentral Remote Boost Sender licensing requirements, see [HP ZCentral Remote Boost Sender licensing on page 4](#). For detailed information and instructions about HP ZCentral Remote Boost Sender licensing, see [Finding more information on page 4](#) to locate the *Licensing Guide*.

5. You will be prompted to restart your computer after the HP ZCentral Remote Boost Sender installation is complete. Select **Yes** when asked to restart the system.
6. Select **Install** to start the installation process.
7. When prompted, restart the computer to complete the installation.


Command-line installation

HP ZCentral Remote Boost command-line options must be preceded by a `/z` flag and be enclosed in double quotation marks, with no space before or after the opening quotation mark and no space before the closing quotation mark. If using multiple commands, separate them with a single space, as in the following example:

```
SenderSetup64.exe /z"/autoinstall /agreetolicense"
```

Silent installation (installing without an end-user interface) is available by using a `/s` flag along with `/z`. See the following example:

```
SenderSetup64.exe /s /z"/autoinstall /agreetolicense"
```

 **NOTE:** By default, the silent installation command will not wait for the installation to complete unless the `/clone_wait` flag is included. See the following example:

```
SenderSetup64.exe /clone_wait /s /z"/autoinstall /agreetolicense"
```

If you need to include a quotation mark as part of a parameter (such as for a folder path), then precede each quotation mark with a forward slash like in the following example:

```
SenderSetup64.exe /z"/autoinstall /agreetolicense /folder="C:RGS Sender""
```

The following table describes the installation-related command-line options.

 **NOTE:** You must issue this command from the location of the `SenderSetup64.exe` installation file.

 **NOTE:** Unless a folder path is specified, HP ZCentral Remote Boost is installed in the folder `C:\Program Files\HP\Remote Graphics Sender`.


 **IMPORTANT:** The options `/autoinstall` and `/agreetolicense` are always required when you install from the command line.

Table 3-3 Installation options and their descriptions

Option	Description
<code>/autoinstall</code>	Initiates the installation
<code>/agreetolicense</code>	Accepts the license agreement
<code>/folder="<folder path>"</code>	Specifies the folder path to install to, which is the following by default: <code>C:\Program Files\HP\Remote Graphics Sender</code> NOTE: The folder path <code>C:\Program Files\HP\Remote Graphics Sender</code> applies only to 64-bit versions of Windows. On 32-bit versions of Windows, the folder path is <code>C:\Program Files\Hewlett-Packard\Remote Graphics Sender</code> .
<code>/usb</code>	Installs the Remote USB feature
<code>/clipboard</code>	Installs the Remote Clipboard feature
<code>/el</code>	Enables Easy Login or Single Sign-on
—or—	NOTE: If neither option is specified, the standard authentication method is used.
<code>/sso</code>	
<code>/rgslicensserver=[<port>@]<host></code>	IMPORTANT: You can use either <code>/rgslicensserver</code> or <code>/rgslicensefile</code> but not both. If neither is used, HP ZCentral Remote Boost Sender is installed without a license.
—or—	
<code>/rgslicensefile="<file path>"</code>	<code>/rgslicensserver</code> —Specifies the license server that HP ZCentral Remote Boost Sender should acquire a license from during installation NOTE: If a port is not specified, the default port (27000) of the host is used. <code>/rgslicensefile</code> —Specifies the location of a license file on the local system
<code>/noreboot</code>	Prevents the computer from restarting at the end of the installation process.
<code>/smartcard</code>	Installs the smart card redirection feature.
<code>/enableLegacySecurity</code>	Allows the use of legacy security settings, enabling HP RGS 7.4 and earlier receivers to connect without configuring certificates. Not recommended for highest security.

The following table describes additional command-line options for the installer.


 **NOTE:** If you use either `/help` or `/viewlicense`, all other options are ignored.

Table 3-4 Installation options and their descriptions

Option	Description
<code>/help</code>	Displays the valid command-line options
<code>/viewlicense</code>	Displays the EULA (End User License Agreement)
<code>/autoremove</code>	Initiates an uninstallation

NOTE: You can use the `/noreboot` option to uninstall without rebooting, and the `/removesettings` option to delete user settings while uninstalling.

Installing HP ZCentral Remote Boost Receiver (Linux)

These instructions describe how to install HP ZCentral Remote Boost Receiver on Linux®.


RHEL and Ubuntu

Follow the instructions outlined in this section to install HP ZCentral Remote Boost Receiver on RHEL and Ubuntu.

1. Log in as root.
2. Go to the download directory for the HP ZCentral Remote Boost Receiver, and unpack the HP ZCentral Remote Boost package. HP ZCentral Remote Boost for Linux includes installers specific to Linux distributions. Change to the directory that matches your distribution.

3. Run the following command:

```
./install.sh
```

 **TIP:** Optionally, add the directory `/opt/hpremove/rgreceiver` to your `PATH` environment variable.

4. Enter any of the following installation-related command-line options.

Option	Description
<code>-agreeToLicense</code>	Accepts the license agreement.
<code>-[no]legacyWacom</code>	Enables the previous Wacom pen solution. NOTE: When this option is provided, the Wacom pen solution works only with a Linux receiver.
<code>-h</code>	Displays help message.
<code>-or-</code>	
<code>-help</code>	



NOTE: To verify the integrity of Linux install packages, visit [HP ZCentral Remote Boost Linux Package Verification](#).

HP ThinPro

Follow the instructions outlined in this section to install Remote Boost on HP ThinPro.

1. While in Admin mode, open the **Control Panel**.
2. Select **Manageability**, and then open **Easy Update**.
3. Navigate to **Updates > Service Pack Updates**.
4. Select the version of Remote Boost that you want to install, and select **Install**.
5. After installation is complete, a restart is required before you can use Remote Boost.

Installing HP ZCentral Remote Boost Sender (Linux)

These instructions describe how to install HP ZCentral Remote Boost Sender on Linux.

1. Log in as root.
2. Go to the download directory for the HP ZCentral Remote Boost Sender, and unpack the HP ZCentral Remote Boost package. HP ZCentral Remote Boost for Linux includes installers specific to Linux distributions. Change to the directory that matches your distribution.

3. Execute the following command:

```
./install.sh
```

4. Enter any of the following installation-related command-line options.

Option	Description
<code>-agreeToLicense</code>	Accepts the license agreement.
<code>-[no]smartcard</code>	Enables smart card support without prompting.
<code>-nolicenseconfig</code>	Skips the license configuration.
<code>-enableLegacySecurity</code>	Allows connections from older RGS Receivers.
<code>-h</code>	Displays help message.
<code>—or—</code>	
<code>-help</code>	

5. If the sender has the psc-lite package installed, the installer gives you the option to install smart card redirection. By default, this feature does not install.



NOTE: To verify the integrity of Linux install packages, visit [HP ZCentral Remote Boost Linux Package Verification](#).

Installing HP ZCentral Remote Boost Receiver (macOS)

On macOS®, you can install HP ZCentral Remote Boost Receiver using the installer wizard or on the command line.

 **NOTE:** If the software is already installed, the installation process overwrites it.

Installer wizard installation


You can use the wizard to install HP ZCentral Remote Boost Receiver.

1. Log in as an administrator (or be able to provide administrator credentials).
2. Run **HP RGS Receiver.pkg**, and then follow the on-screen instructions.

Command-line installation

Execute the following command:

```
sudo installer -pkg "HP\RGS\Receiver.pkg" -target /
```

 **NOTE:** To install HP ZCentral Remote Boost Receiver in a location other than the root of the boot volume, enter `/Volumes/OtherDrive` instead of `/` at the end of the command.

4 HP ZCentral Remote Boost Receiver overview

The HP ZCentral Remote Boost Receiver runs locally.

Opening HP ZCentral Remote Boost Receiver

To open HP ZCentral Remote Boost Receiver, use one of the following procedures.

Opening HP ZCentral Remote Boost Receiver on Windows

To open HP ZCentral Remote Boost Receiver on Windows:

- ▲ Perform the action in the following table that corresponds to the operating system of the receiver.

Table 4-1 Windows operating systems and their procedures

Operating system	Procedure
Windows 10	Select Start , type <code>HP ZCentral Remote Boost</code> , and then select HP ZCentral Remote Boost Receiver from the search results.

Opening HP ZCentral Remote Boost Receiver on Linux

To open HP ZCentral Remote Boost Receiver on Linux:

- ▲ Run the executable file `/opt/hpremove/rgreceiver/rgreceiver.sh`.

– or –

Select either the **Applications** or **Activities** menu, and then select HP ZCentral Remote Boost Receiver.

Opening HP ZCentral Remote Boost Receiver on macOS

To open HP ZCentral Remote Boost Receiver on macOS:

- ▲ Select the HP Remote Boost icon in Launchpad.

 **TIP:** HP ZCentral Remote Boost Receiver can alternatively be started on the command line (see [HP ZCentral Remote Boost Receiver command-line options on page 27](#)).

HP ZCentral Remote Boost Receiver GUI (Windows/Linux)

Several items are displayed on the GUI.

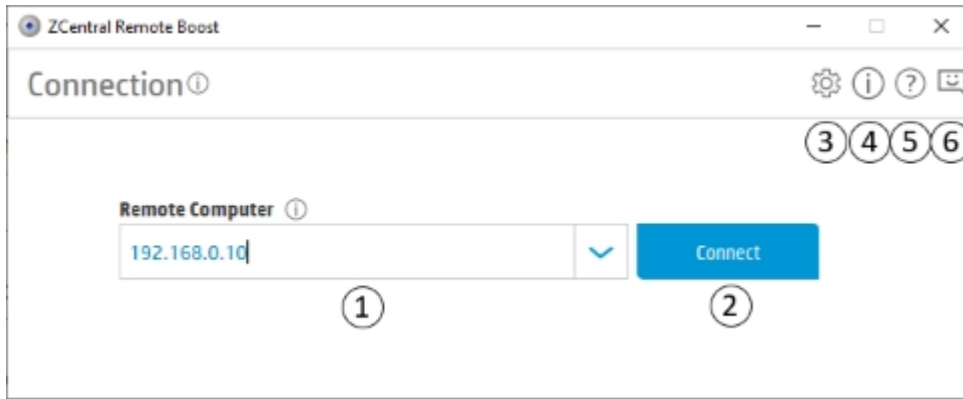


Table 4-2 GUI items and their descriptions

Item	Description
1	Enter the host name or IP address of the sender in this field. TIP: The drop-down list contains recent entries.
2	Initiates the connection.
3	Opens the Settings panel (see HP ZCentral Remote Boost Receiver settings on page 23 for more information).
4	Opens the Info panel, which contains version information and the <i>End User License Agreement (EULA)</i> for HP ZCentral Remote Boost, as well as third-party acknowledgments.
5	Opens the <i>User Guide</i> (this document).
6	Opens a Remote Boost feedback survey on your web browser.

HP ZCentral Remote Boost Receiver GUI (macOS)

Several items are displayed on the GUI.

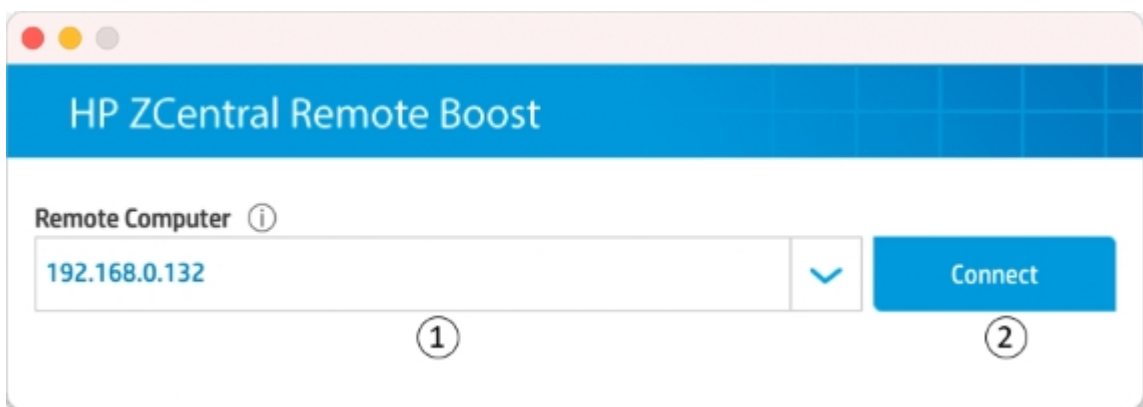


Table 4-3 GUI items and their descriptions

Item	Description
1	Enter the host name or IP address of the sender in this field. TIP: The drop-down list contains recent entries.
2	Initiates the connection.

Starting an HP ZCentral Remote Boost session

To start an HP ZCentral Remote Boost session:

1. On the **Home** panel of HP ZCentral Remote Boost Receiver, enter the host name or IP address of the sender, and then press the **Enter** key or select the **Connect** button.
2. This step depends on the authentication method you are using (see [Authentication on page 48](#)).

Enter the credentials as required by the authentication method.

If authentication is successful, the HP ZCentral Remote Boost session starts, and the sender desktop appears inside the HP ZCentral Remote Boost Receiver window that opens on the receiver.

Note the following additional information about creating an HP ZCentral Remote Boost connection:

- You cannot connect to more than one sender at a time using the GUI of HP ZCentral Remote Boost Receiver. If an attempt is made to connect to a second sender, the connection to the first sender is terminated. For information about how to connect to more than one sender at a time, see [Directory Mode on page 73](#).

HP ZCentral Remote Boost Receiver window GUI (Windows/Linux)

Several items are displayed on the GUI.

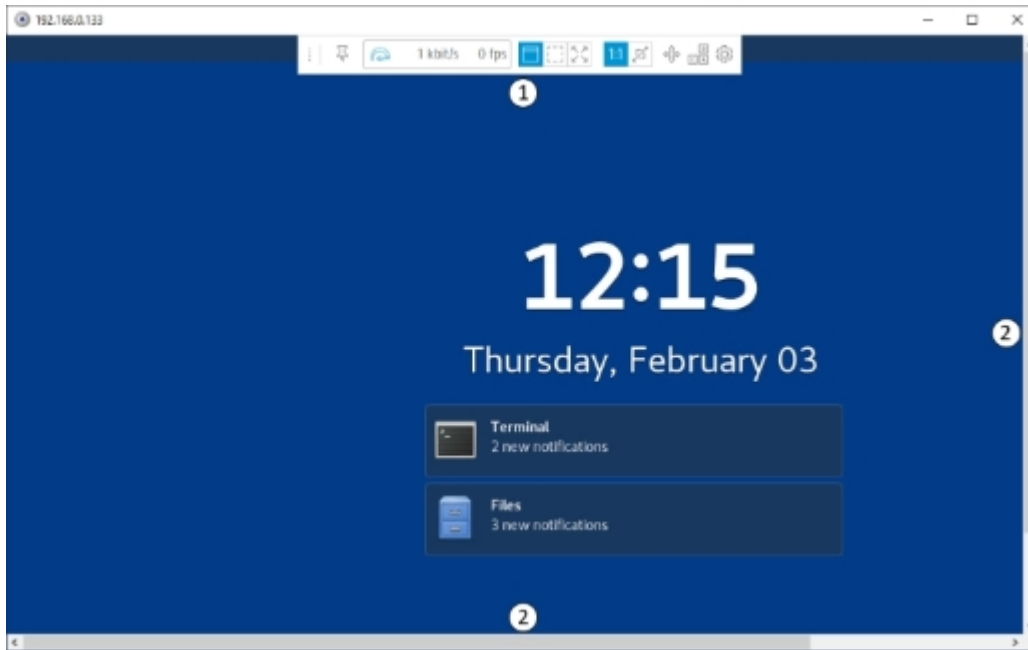


Table 4-4 GUI items and their descriptions

Item	Description
1	The HP ZCentral Remote Boost Receiver toolbar provides access to the most frequently used options (see HP ZCentral Remote Boost Receiver toolbar GUI (Windows/Linux) on page 19 for more information).
2	Scroll bars appear if the resolution of the sender is larger than the size of the HP ZCentral Remote Boost Receiver window.











HP ZCentral Remote Boost Receiver toolbar GUI (Windows/Linux)

Several icons are displayed in the GUI.

Table 4-5 Icons and their descriptions

Icon	Description
	By clicking and holding the left mouse button while moving the mouse, the toolbar may be moved horizontally.
	Allows the toolbar to be pinned or unpinned to the Receiver window. If it is unpinned, it will hide when not in use. To unhide the toolbar, hover the mouse near the top of the Receiver window.
	Displays the current status of HP Velocity (see HP Velocity on page 48 for more information).
23 kbit/s	Displays the current network bandwidth consumed by the connection.
30 fps	Displays the number of image updates in frames-per-second.

Table 4-5 Icons and their descriptions (continued)

Icon	Description
	Opens the virtual keyboard (see Using touch features (Windows touch-capable devices only) on page 63 for more information).
	Enables the virtual mouse (see Using touch features (Windows touch-capable devices only) on page 63 for more information). TIP: The virtual mouse also can be enabled and disabled using the 4-finger tap gesture.
	Toggles Setup Mode (see Setup Mode on page 22).
	Sends a virtual Ctrl+Alt+Del command to the sender.
	Opens the Settings panel (see HP ZCentral Remote Boost Receiver settings on page 23 for more information).
	Adds borders to the HP ZCentral Remote Boost Receiver window, allowing it to be moved and resized.
	Removes borders from the HP ZCentral Remote Boost Receiver window.
	Makes the HP ZCentral Remote Boost Receiver window expand to fill the boundaries of the current active monitor screen.
	Enables 1:1 Pixel Mode, which causes the remote desktop to be displayed at the exact same size on the HP ZCentral Remote Boost Receiver window. If the remote desktop is larger than the HP ZCentral Remote Boost Receiver window, scroll bars are added to the window. If the remote desktop is smaller, a black area is added around the desktop.
	Enables Scaled Pixel Mode, which causes the remote desktop to be scaled to fill the HP ZCentral Remote Boost Receiver window. Black bars might be added either horizontally or vertically to keep the same aspect ratio.

HP ZCentral Remote Boost Receiver window GUI (macOS)

Several items are displayed on the GUI.

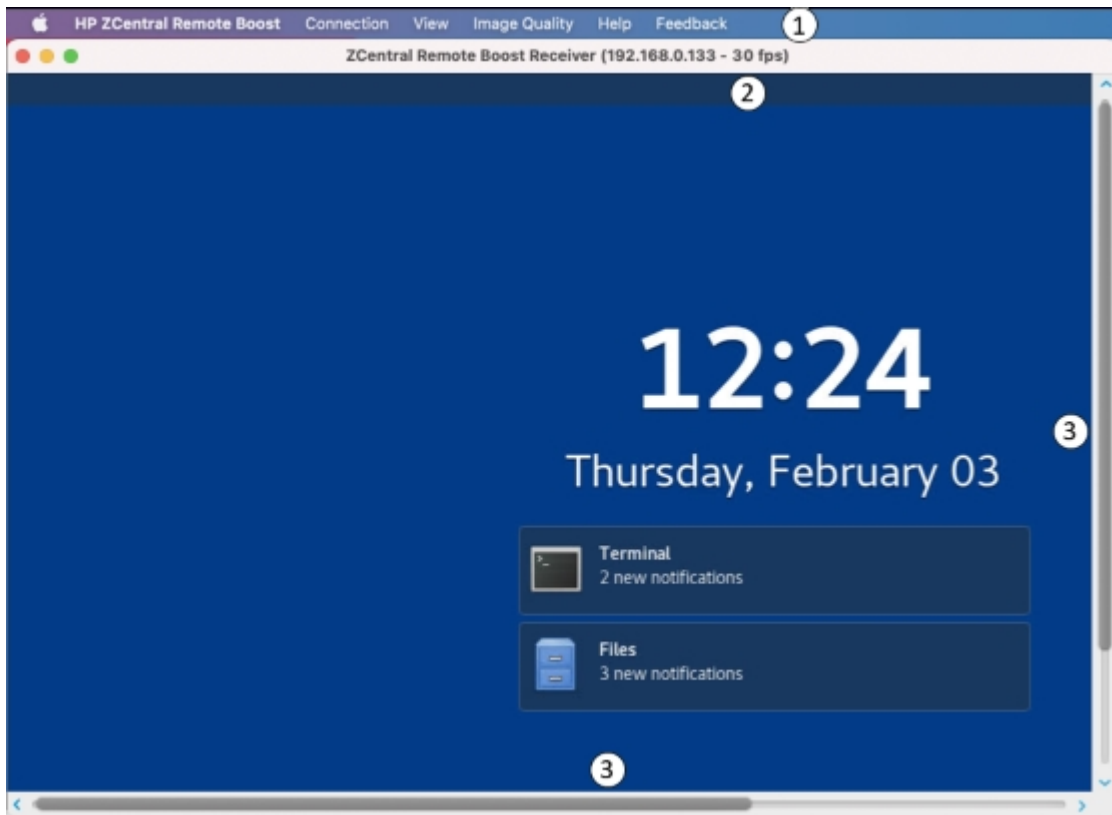


Table 4-6 GUI items and their descriptions

Item	Description
1	<p>The HP ZCentral Remote Boost Receiver menu bar provides access to the most frequently used options via the following menus:</p> <ul style="list-style-type: none"> • HP ZCentral Remote Boost Receiver: Lets you view version information, change settings (see HP ZCentral Remote Boost Receiver settings on page 23), and quit HP ZCentral Remote Boost Receiver. <p>NOTE: HP ZCentral Remote Boost settings are also known as preferences on macOS.</p> <ul style="list-style-type: none"> • Connection: Lets you enable Setup Mode (see Setup Mode on page 22), send a virtual Ctrl+Alt+Del command to the sender, and disconnect from the sender. • View: Lets you select 1:1 Pixel Mode or Scaled Pixel Mode. Also, lets you switch among windowed, borderless, or full-screen window modes. • Image Quality: Lets you set the image quality (see Performance on page 24 for more information). • Help: Lets you open the <i>User Guide</i> (this document). • Feedback: Lets you start a Remote Boost feedback survey on your web browser.
2	Displays the number of image updates in frames-per-second.
3	Scroll bars appear if the resolution of the sender is larger than the size of the HP ZCentral Remote Boost Receiver window, or when the Receiver window is adjusted below the size of the sender resolution.

Setup Mode

In Setup Mode, transmission of keyboard and mouse input to the sender is suspended. Instead, the keyboard and mouse can be used to interact with the HP ZCentral Remote Boost Receiver window on the receiver. In this mode, you can do the following:

- Move an HP ZCentral Remote Boost Receiver window that has its title bar and borders hidden
- Select (bring to the front) a specific HP ZCentral Remote Boost Receiver window that might be obscured by another HP ZCentral Remote Boost Receiver window in Directory Mode
- The following Setup Mode HotKeys can be used to control the HP ZCentral Remote Boost Receiver application:

M: Display the HP ZCentral Remote Boost Receiver Settings window.

N: Minimize the Receiver window.

C: Close the Receiver window.

G: Toggle Game Mode.

H: Hide the toolbar.

F: Fit the Receiver window size to the Sender desktop size.

Setup Mode can be activated in two ways:

- Select the Setup Mode button (Windows/Linux) or menu item (macOS) on the HP ZCentral Remote Boost Receiver toolbar to toggle the state of Setup Mode.
- Type the default hotkey sequence as follows:

Press and hold down **Left Shift**. While pressing **Left Shift**, press and release **Space**. Setup Mode will remain active as long as **Left Shift** is held down.



NOTE: The default hotkey sequence can be changed (see [Changing the Setup Mode hotkey sequence on page 22](#)).

Changing the Setup Mode hotkey sequence

To change the Setup Mode hotkey sequence:

HP ZCentral Remote Boost allows you to change the Setup Mode hotkey sequence from its default value of **Left Shift** press, **Space** press, and **Space** release.

When defining a new Setup Mode hotkey sequence, the following keys can be used:

- **Left Ctrl, Right Ctrl, Ctrl**—Specifies a left, right, or side-insensitive **Ctrl** key, respectively.
- **Left Alt, Right Alt, Alt**—Specifies a left, right or side-insensitive **Alt** key, respectively.
- **Shift**
- **Space**

Every sequence must begin with **Ctrl**, **Alt**, or **Shift**. Two actions are associated with each key:

- **Down:** Specifies a key press.

- Up: Specifies a key release.
1. In the **Hotkeys** panel of the HP ZCentral Remote Boost Receiver settings, select **Set**.
 2. Press and hold the first key that you want to use in the sequence.
 3. Press and release the other keys that you want to use in the sequence.
 4. Release the initial key.

Select **Reset** restores the Setup Mode hotkey sequence to its default values.

HP ZCentral Remote Boost Receiver settings

This section describes the settings available in HP ZCentral Remote Boost Receiver, which are divided into the following categories:

Connection

The following table describes the settings available in the **Connection** panel.

Table 4-7 Settings and their descriptions

Setting	Description
Prompt for user name and password	<p>Forces the authentication prompt to display when you start an HP ZCentral Remote Boost connection.</p> <p>In certain scenarios, HP ZCentral Remote Boost does not prompt you to enter a domain, user name, and password when starting an HP ZCentral Remote Boost connection. If you need to enter a domain, user name, and password, then select this box.</p> <p>TIP: This is advantageous when you use HP ZCentral Remote Boost in Directory Mode, where each session has different connection needs.</p> <p>NOTE: Windows only</p>
Do not change the Sender display(s)	Do not change the resolution or layout of the sender's displays.
Set Sender display(s) to match Receiver display(s)	<p>Attempts to set the sender's display resolution and layout to match the receiver's display resolution and layout.</p> <p>For example, if the receiver has two monitors side-by-side and an overall display resolution of 2560 × 1024, HP ZCentral Remote Boost attempts to set the same resolution and layout on the sender's displays. If that fails, HP ZCentral Remote Boost attempts to set a resolution of 2560 × 1024 on a single sender display.</p> <p>NOTE: This option is not supported on Linux by default. You must configure the X Server with the proper modelines, metamodes, or both for this option to work. See Matching display resolution and layout (Linux-based sender) on page 58 for more information.</p>
Set Sender display(s) to match display properties	<p>Attempts to set the sender's display resolution and layout to match the specified display properties. See Image and Display on page 79 for more information.</p> <p>NOTE: This option is not available if no display properties are found in the configuration file.</p>
Automatically hide the menu bar and dock when in borderless mode	<p>If enabled, hides the menu bar and dock when the Receiver window is in borderless mode, similar to what happens when full-screen window mode is used.</p> <p>NOTE: macOS only</p>

Table 4-7 Settings and their descriptions (continued)

Setting	Description
Enable remote USB	Enables Remote USB. NOTE: Windows/HP ThinPro only
Select Sender	Becomes active when Directory Mode is enabled. Allows the user to remote USB devices to a sender selected from the drop-down list.
Certificate Verification Failure Policy	Specifies what the HP ZCentral Remote Boost Receiver does if the verification of the sender certificate fails.
Enable remote clipboard	Enables Remote Clipboard.

Performance

The performance settings allow you to improve the interactive experience. Typically, these adjustments will be made when working with highly interactive applications (such as a CAD application) in a low-bandwidth or high-latency network environment.

The following table describes the settings available in the **Performance** panel.

Table 4-8 Settings and their descriptions

Setting	Description
Enable HP Velocity	Enables HP Velocity.
Advanced Video Compression on Sender	Enables Advanced Video Compression. NOTE: Windows/Linux only
Image Quality	Sets the maximum image quality. When not using Adaptive image quality , HP ZCentral Remote Boost will maintain the image quality specified by this option. When selecting Adaptive image quality , HP ZCentral Remote Boost will use this option's setting as the target image quality when the updates-per-second value allows.
Enable adaptive image quality	When Enable adaptive image quality is selected, HP ZCentral Remote Boost will begin to degrade the image quality down to the Minimum image quality setting (from 0–100) anytime the updates-per-second value falls below the Target update rate (from 0–30 updates per second). When Increase text rendering quality is selected, HP ZCentral Remote Boost uses different encoding for areas of the sender's display with few colors (areas with mostly text) to increase the quality when those areas are displayed on the receiver. In video-centric or bandwidth-constrained environments, disabling this option might improve HP ZCentral Remote Boost performance. NOTE: These options are disabled when Advanced Video Compression is enabled.
Increase text rendering quality	
Minimum image quality	
Target update rate	
TIP: See the HP ZCentral Remote Boost Configuration Guide for more information about ways to optimize HP ZCentral Remote Boost performance.	

Gestures (Windows touch-capable devices only)

You can use the gesture settings to map hotkey sequences to the gestures that are not used by HP ZCentral Remote Boost by default.

For a list of the gestures that you can customize, see [Using touch features \(Windows touch-capable devices only\) on page 63](#).

Mapping a hotkey sequence to a gesture

To map a hotkey sequence to a gesture:

1. Select the pencil icon in the row of the gesture that you want.
2. Enter the key sequence.
3. Optionally select **Enable sticky gesture** if you want the gesture to mimic the continual press of the hotkey sequence until the same gesture is used to disable the sequence.
4. Select **Save**.

Unmapping a hotkey sequence from a gesture

To unmap a hotkey sequence from a gesture:

- ▲ Select the **X** icon in the row of the gesture that you want.

Audio

The following table describes the settings available in the **Audio** panel.

Table 4-9 Audio settings and their descriptions

Setting	Description
Stream audio from Sender	Enables the sending of the audio stream to the receiver
Stereo	Enables stereo audio for the audio stream sent from the sender to the receiver. NOTE: Stereo audio requires more network bandwidth.
Quality	Sets the quality for the audio stream being transmitted by the sender. NOTE: Higher-quality audio requires more network bandwidth.
Audio allows focus	Enables audio to play only from the HP ZCentral Remote Boost Receiver window that has focus. When disabled, audio from all HP ZCentral Remote Boost Receiver windows will be combined.
Volume	Controls the volume level on the receiver. NOTE: This option is for Windows and Linux only. On macOS, use the system volume control instead.

Network

The following table describes the settings available in the **Network** panel.

Table 4-10 Network settings and their descriptions

Setting	Description
Error	Sets the time in seconds that HP ZCentral Remote Boost Receiver will wait before ending the connection after failing to detect HP ZCentral Remote Boost Sender.

Table 4-10 Network settings and their descriptions (continued)

Setting	Description
Warning	Sets the time in seconds that HP ZCentral Remote Boost Receiver will wait before displaying a warning dialog to the local user after failing to detect HP ZCentral Remote Boost Sender.
Dialog	Sets the time in seconds that HP ZCentral Remote Boost Receiver will wait for a response to a dialog being displayed on the sender (such as an authentication dialog). The request will be canceled if there is no response.
Use a proxy server for your LAN	Enables the use of a proxy server with HP ZCentral Remote Boost.
Address	If you use a proxy server, configuring these settings is required to activate HP ZCentral Remote Boost Advanced Features such as Advanced Video Compression and HP Velocity. See HP ZCentral Remote Boost Advanced Features on page 47 for more information.
Port	

Hotkeys

The following table describes the settings available in the **Hotkeys** panel.

Table 4-11 Hotkeys settings and their descriptions

Setting	Description
Send First Key	<p>Forces the first key of a local hotkey sequence to be transmitted to the sender.</p> <p>By default, if a key press matches the first key of a local Setup Mode sequence, all key events are held until HP ZCentral Remote Boost determines whether the next keys pressed are completing the sequence. If it is not a Setup Mode sequence, all key press events are then transmitted to the sender.</p> <p>However, commands for some remote applications might require that the first key press event arrive separately for them to function correctly. Enabling this option will ensure the immediate transmission of the first key press.</p> <p>NOTE: In addition to transmitting the first key press to the sender, the key is also still processed by the receiver.</p>
Send CTRL-ALT-END key sequence as CTRL-ALT-DEL	<p>Enables the use of a Ctrl+Alt+End key sequence as a Ctrl+Alt+Delete sequence for the sender.</p> <p>This is useful when logging into the sender because, on some computers, the local operating system will interrupt the standard Ctrl+Alt+Delete key sequence and bring up local Windows security options instead.</p> <p>TIP: The Ctrl+Alt+Del sequence can also be sent using the HP ZCentral Remote Boost Receiver toolbar.</p>
Key Repeat	<p>Enables the processing of key repeats for when the Shift key is held down.</p> <p>By default, key repeat processing is disabled by HP ZCentral Remote Boost, but some remote applications might require this functionality.</p> <p>NOTE: If this option is enabled, the default Setup Mode hotkey sequence will not trigger unless it is typed fast enough.</p>
Setup Mode Sequence	<p>Sets the hotkey sequence for switching to Setup Mode.</p> <p>For more information, see Changing the Setup Mode hotkey sequence on page 22.</p>

Logging

The following table describes the settings available in the **Logging** panel.

Table 4-12 Logging settings and their descriptions

Setting	Description
Enable message logging	Enables logging.
Log file path	Specifies the path of the log file.
Log level	Determines the level of information that is logged. For example, if WARN is selected, the log file will contain information of the type WARN and also anything more serious than that type (ERROR and FATAL). To log all information generated by HP ZCentral Remote Boost Receiver, select DEBUG .
Max logfile size (KB)	Limits the size of the log file.
Clear Log	Clears the contents of the log file.
View Log	Displays the contents of the log file.
Restore Defaults	Resets all logging settings to the default values.

Statistics (Windows/Linux only)

The following table describes the information displayed in the **Statistics** panel.

Table 4-13 Statistics settings and their descriptions

Item	Description
Total network usage (Mbits/sec)	Displays the combined network traffic received from all connections.
Image updates per second	Displays the combined number of image updates per second received from all connections.
Current network loss with HP Velocity	These items display statistics about HP Velocity when it is activated and in use.
Current network loss without HP Velocity	
Peak network loss with HP Velocity	
Peak network loss without HP Velocity	

HP ZCentral Remote Boost Receiver command-line options

The following table describes the valid command-line options for the Windows executable **rgreceiver.exe**, the Linux shell script **rgreceiver.sh**, and the macOS executable **HP ZCentral Remote Boost Receiver**.



NOTE: These commands must be issued from the HP ZCentral Remote Boost receiver installation directory.

Table 4-14 Command-line options and their descriptions

Option	Description
<code>-config <file name></code>	Specifies the configuration file to use for the instance of HP ZCentral Remote Boost Receiver being opened NOTE: See Setting property values in a configuration file on page 94 for more information.
<code>-directory <file name></code>	Opens HP ZCentral Remote Boost Receiver in Directory Mode using the configuration from the specified directory file NOTE: See Directory Mode on page 73 for more information.
<code>-nosplash</code>	Disables the splash screen that displays by default when HP ZCentral Remote Boost Receiver is opened
<code>-{version ver v}</code>	Displays version information for HP ZCentral Remote Boost Receiver
<code>-{help h ?}</code>	Displays the valid command line options
<code>-<property name>=<value></code>	Sets the specified HP ZCentral Remote Boost Receiver property to the specified value NOTE: See Setting property values on the command line on page 94 for more information.

5 HP ZCentral Remote Boost Sender overview

The HP ZCentral Remote Boost Sender runs remotely.

HP ZCentral Remote Boost Sender overview (Windows)

To stop, start, or restart the `rgsender` service:

HP ZCentral Remote Boost Sender for Windows is comprised of three processes:

- `rgsendersvc.exe`—Runs as a Windows service named `rgsender` that starts automatically (by default) when Windows starts and also starts the other two processes
- `rgsender.exe`—The main process for HP ZCentral Remote Boost Sender
- `rgsender_gui.exe`—The notification icon, which can be found in the Windows notification area

If Windows is already started, there is no additional action required to start HP ZCentral Remote Boost Sender (unless you have manually disabled automatic startup for the `rgsender` service).

The `rgsender` service must be active for the other two processes to be running, so if you want to completely disable HP ZCentral Remote Boost Sender, stop the `rgsender` service.

- ▲ On the **Services** panel of Windows Task Manager, right-click **rgsender**, and then select an option.

HP ZCentral Remote Boost Sender overview (Linux)

HP ZCentral Remote Boost Sender for Linux is started as a service named `rgsender`. This service is automatically enabled and started during installation and automatically restarts in the event of a failure.

On a system supporting `systemd` for system services, the you can run the following commands as root to restart, stop, or get the status of the `rgsender` service:

- `systemctl restart rgsender`
- `systemctl stop rgsender`
- `systemctl status rgsender`

On a system supporting `SysV init` for system services, the following commands can be run as root to restart, stop, or get the status of the `rgsender` service:

- `service rgsender restart`
- `service rgsender stop`
- `service rgsender status`

HP ZCentral Remote Boost Sender command-line options (Windows)

To apply command-line options to the HP ZCentral Remote Boost Sender service:

Command-line options for HP ZCentral Remote Boost Sender can be applied to the `rgsservice` by modifying a registry key.


1. Open the **Registry Editor** tool in Windows.
2. Navigate to and select the following registry key:

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\services\rgsender
```

3. Add the command-line options to the **ImagePath** value.

To disallow collaboration, change the value data to the following:

```
C:\Program Files\HP\Remote Graphics Sender\rgsendersvc.exe -nocollab
```

 **IMPORTANT:** The folder path `C:\Program Files\HP\Remote Graphics Sender\rgsendersvc.exe -nocollab` applies to 64 bit versions of Windows. On 32 bit versions of Windows, the folder path is `C:\Program Files\Hewlett Packard\Remote Graphics Sender\rgsendersvc.exe -nocollab`.

4. Restart the `rgsender` service.

The following table describes the valid command-line options.

Table 5-1 Command-line options and their descriptions

Command	Description
<code>-nocollab</code>	Disables collaboration
<code>-timeout <value></code>	Specifies the timeout value, in milliseconds, after which HP ZCentral Remote Boost Sender disconnects an inactive connection
<code>-authtimeout <value></code>	Specifies the timeout value, in milliseconds, that the collaboration authentication dialog is shown before the request is denied automatically
<code>-{version ver v}</code>	Displays version information for HP ZCentral Remote Boost Sender
<code>-{help h ?}</code>	Displays the valid command line options
<code>-<property name>=<value></code>	Sets the specified HP ZCentral Remote Boost Sender property to the specified value

NOTE: See [Setting property values on the command line on page 94](#) for more information.

HP ZCentral Remote Boost Sender command-line options (Linux)

Command-line options for HP ZCentral Remote Boost Sender can be applied to the shell script `rgsender.sh`. The following table describes the valid command-line options.

Table 5-2 Command-line options and their descriptions

Command	Description
-{version ver v}	Displays version information for HP ZCentral Remote Boost Sender
-{help h ?}	Displays the valid command line options

HP ZCentral Remote Boost Sender notification icon (Windows only)

The notification icon for HP ZCentral Remote Boost Sender is located in the Windows notification area and animates if there is an active HP ZCentral Remote Boost session.

You can use the notification icon to do the following:

- Left-click the notification icon to open the HP ZCentral Remote Boost Collaborators window (see [Collaboration on page 50](#) for more information).
- Right-click the notification icon for quick access to the **About** and **Disconnect** options.

HP ZCentral Remote Boost Sender event logging (Windows only)

In addition to standard logging, HP ZCentral Remote Boost Sender logs events.

This information is output to a log named `HPRemote`, which is viewable in the Event Viewer tool in Windows, and can be useful in several different ways:

- Troubleshooting—Event log information can help diagnose HP ZCentral Remote Boost connection issues.
- Remote application termination—See [Creating an agent for remote application termination \(Windows only\) on page 114](#) for more information.
- Other automated actions—The basic principle behind using the event log for remote application termination can be used to create an agent that performs other automated actions.

Filtering access to HP ZCentral Remote Boost Senders

You can filter access to HP ZCentral Remote Boost Senders using either user names or network identifiers.

Filtering by user name

You can restrict HP ZCentral Remote Boost connections by configuring the Sender `userfilter.txt` file to specify the user names, or regular expressions to match the user names, that are allowed to make a connection. If the provided user name does not match one of the filters, the connection is denied. By default, the `userfilter.txt` file allows all user names.



IMPORTANT: The `userfilter.txt` file must allow all user names when Easy Login is enabled. Remote Boost cannot filter connections by user name when using Easy Login because the first authentication step is skipped.

The file `userfilter.txt` is located in the installation folder on Windows and in `/etc/opt/hpremove/rgsender` on Linux.



NOTE: Administrator privileges are required to read or write to this file.

User name entries in the `userfilter.txt` file are not case sensitive.

Filtering is performed only on the user name portion of a user's credentials. This means a domain account with the same user name as a local account is treated as the same user name.

As an example, if `james` is added to the `userfilter.txt` file on a sender system, connections from both the domain user `corp.net\james` and the local user `james` are allowed.

Filtering by network identifiers

You can restrict HP ZCentral Remote Boost connections by configuring the Sender `ipfilter.txt` file to specify the IP addresses, subnet masks, and the fully qualified computer and domain names of the receiver systems that are allowed to make a connection. If a receiver does not match one of the filters, the connection will be denied.

The file `ipfilter.txt` is located in the installation folder on Windows and in `/etc/opt/hpremove/rgsender` on Linux.

Connection filtering based on host name and domain name requires DNS to be configured to allow reverse DNS lookup. For example, if the receiver IP address is `10.13.19.1`, the command `nslookup 10.13.19.1` returns a host name and domain name. HP ZCentral Remote Boost similarly uses reverse look up for host name and domain name filtering.

As an example, adding the following lines to the `ipfilter.txt` file on a sender system that allows only connections from receiver systems `computername1` and `computername2`:

```
HOSTNAME:computername1.networkdomain.name
```

```
HOSTNAME:computername2.networkdomain.name
```


Filtering on the domain name compares the text after the first period in the domain name. For example, if DNS reverse lookup returns `james.auth.corp.net`, the filter compares `auth.corp.net` against domain name entries in the `ipfilter.txt` file to determine whether to allow connections from the receiver.


You can combine filter types in one `ipfilter.txt` file. After a match is made with a filter specified in the `ipfilter.txt` file, HP ZCentral Remote Boost stops processing the file and allows the connection to be made. By default, the `ipfilter.txt` file does not filter out any connections. If the receiver connects to the sender over VPN or through another process that causes the IP address to be translated, HP ZCentral Remote Boost might prevent connections that users expect to work. For additional information, review the `ipfilter.txt` file on a system where the HP ZCentral Remote Boost Sender has been installed.

6 Using a certificate signed by a Certificate Authority (CA)

For ease in deployment, HP ZCentral Remote Boost creates a self-signed certificate for the sender. For greater security, you can configure HP ZCentral Remote Boost to use a certificate signed by a Certificate Authority (CA).


To use a certificate signed by a CA on the sender, the signed certificate and its private key must be present on the sender system. The Root CA must be configured on the receiver system. Any intermediate CAs must be installed on either the sender or receiver system.

 **NOTE:** HP recommends that you configure all intermediate CAs on the sender system. By doing so, the receiver system will have the root CA installed only locally. If you do not configure the intermediate CAs on the sender system, then all the intermediate CAs (as well as the root CA) will need to be configured on each receiver system.

 **NOTE:** Sender certificates should have the **Enhanced Key Usage** field set to **Server Authentication**. This will prevent issues when trying to access a sender from the receiver on some macOS versions.

Configuring the sender to use a signed certificate


The sender can be configured to use a file-based certificate. On Windows, it is also possible for the sender to use a certificate stored in the Windows certificate store.

 **NOTE:** For enhanced security on Windows, HP recommends that you configure the sender to use a certificate from the Windows certificate store instead of using a file-based certificate.

Configuring the sender to use a file-based certificate

There are two ways to configure the sender to use a file-based certificate.

- Modifying the `rgsenderconfig` file
- Using the sender configuration tool

 **NOTE:** For enhanced security on Windows, HP recommends that you configure the sender to use a certificate from the Windows certificate store instead of using a file-based certificate.

Configuring file-based certificates by modifying the `rgsenderconfig` file

Follow this procedure to change the sender to use a file-based certificate by modifying the `rgsenderconfig` file.

1. On the sender system, open the `rgsenderconfig` file. On Windows, the file is located in the sender installation directory (default file path is `C:\Program Files\HP\Remote Graphics Sender`). On Linux, the file is located in `/etc/opt/hpremove/rgsender`.
2. Update the following line:

```
Rgsender.Network.Certificate.Source=File@filePath
```

where `filePath` is the full path to the certificate file. The certificate file must be in the PFX format, also known as P12. The certificate must contain the private key, and it must not be password protected. The following is an example of the file path on a Windows system:

```
Rgsender.Network.Certificate.Source=File@c:\certificates\mySender.pfx
```

The following is an example of the file path on a Linux system:

```
Rgsender.Network.Certificate.Source=File@/home/user/certs/mySender.pfx
```



NOTE: Once the property has been updated, delete the # character in front of the property to uncomment and enable it.

Configuring file-based certificates using the sender configuration tool

Follow this procedure to configure the sender to use a file-based certificate using the sender configuration tool.

1. On the sender system, launch `SenderConfigApp.exe`.
2. Select the **Certificate** tab, the **File** radio button, and then the **Browse** button.
3. Use the file picker to select the file-based certificate.
4. Select the **Save** button.

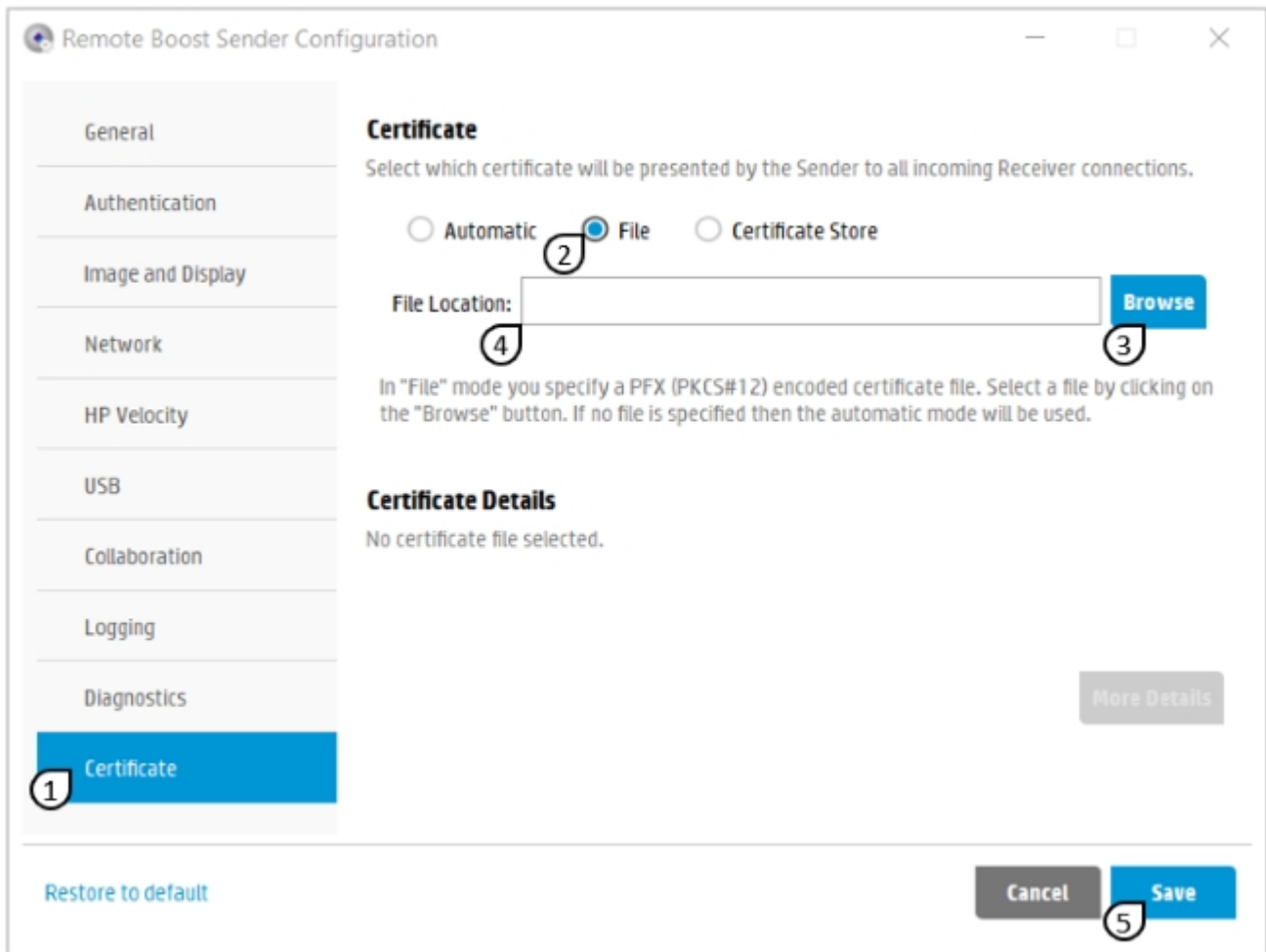


Table 6-1 Selecting a file-based certificate using the sender configuration tool

Item	Description
1	Certificate tab
2	File radio button
3	Browse button
4	File picker
5	Save button

Configuring file-based intermediate CAs

To configure intermediate CAs on a Linux sender, the certificate file must also contain all intermediate CAs used in the certificate chain.

To create a `.PEX` file containing the sender certificate and key, plus any intermediates, you will need a tool such as `openssl`. For example:

1. Assume that you have a sender certificate (PEM format) in a file called `sender.pem` and key in a file called `sender.key`. Also assume that you have your intermediate CA chain appended into a PEM file called `CAchain.pem`.
2. Put the output PFX in a file called `sender.pfx`
3. Run the following command:

```
openssl pkcs12 -export -out sender.pfx -inkey sender.key -in
sender.pem -certfile CAchain.pem
```

To configure intermediate CAs on Windows, the intermediate CAs must be added to the Windows certificate store. You can still use a file to configure the sender certificate, but if you want to configure the intermediate CAs, then they must be added to the `Intermediate Certification Authorities` folder in the `LocalMachine` certificate store.

For more information about how to add certificates to the certificate store on Windows, see [Adding Certificates to the certificate store on page 41](#).

Configuring the sender to use a certificate from the store (Windows only)

On Windows systems, it is possible to configure the sender to use a certificate that is stored in the certificate store. For more information about how to add certificates to the certificate store, see [Adding sender certificates and CAs to the Windows certificate store on page 41](#). There are two ways to configure the sender to use a certificate from the certificate store.

- Modifying the `rgsenderconfig` file
- Using the sender configuration tool

Configuring certificates from the certificate store by modifying the `rgsenderconfig` file

Follow this procedure to configure the sender to use a certificate from the certificate store by modifying the `rgsenderconfig` file.

1. On the sender system, open the `rgsenderconfig` file in the sender installation directory (default file path is `C:\Program Files\HP\Remote Graphics Sender`).
2. Update the following line:

```
Rgsender.Network.Certificate.Source=Store
```

This line configures the sender to use the newest certificate from the folder that is defined in step 3. If you want to specify the exact certificate, use the following line instead:

```
Rgsender.Network.Certificate.Source=Store@Query
```

where `Query` is a certificate query that selects a certificate from the store. The query is composed of one or more `field:value` pairs that are separated by white space. The valid field names are described in the table.

Table 6-2 Valid field names


Field name	Description
<code>Issuer</code>	Matches a substring of the issuer's name.


Table 6-2 Valid field names (continued)


Field name	Description
IssuerDN	Matches the issuer's entire distinguished name.
Serial	Matches the certificate's serial number.
Subject	Matches a substring of the subject's name.
SubjectDN	Matches the subject's entire distinguished name.
SubjectKeyId	Matches the certificate's subject key identifier.
Thumbprint	Matches the certificate's SHA1 hash.

The field names are not case-sensitive. If multiple criteria are specified, only certificates that match all criteria are selected. Values must be enclosed in single or double quotation marks to preserve white space. A query example that selects all certificates where the subject contains `MySender` is:

```
Rgsender.Network.Certificate.Source=Store@Subject:MySender
```

 **NOTE:** The query search must resolve to a single certificate. If the query finds more than one certificate, then the sender uses the first certificate that was found. For that reason, HP recommends using the `SubjectKeyId` field in the query to unequivocally identify a single certificate.


 **NOTE:** Because the sender runs as a Windows service, all sender certificates must be installed in the `LocalMachine` store. The sender cannot access the `CurrentUser` store.


 **NOTE:** Once the property has been updated, delete the `#` character in front of the property to uncomment and enable it.

3. Optionally, update the following line:

```
Rgsender.Network.Certificate.StoreName=StoreName
```

where `StoreName` is the name of the folder in the `LocalMachine` store that contains the certificates. By default, the sender looks for certificates in the `HP Remote Boost` folder. This folder is created when the sender runs for the first time.

 **NOTE:** HP recommends that you configure the sender to use certificates from the default `HP Remote Boost` folder or from the `Personal` folder.

 **NOTE:** Once the property has been updated, delete the `#` character in front of the property to uncomment and enable it.

Configure certificates from the certificates store using the sender configuration tool

Follow this procedure to configure the sender to use a certificate from the certificate store using the sender configuration tool.

1. On the sender system, launch `SenderConfigApp.exe`.
2. Select the **Certificate** tab, select **Certificate Store**, and then select the **Browse** button.
3. Select a certificate folder by editing the **Store** field.
4. If you want to use the newest certificate from the **Store**, select **Newest** in the **Mode** combo box.

- If you want to use a custom certificate instead, select **Custom** in the **Mode** combo box and then the **Select** button.

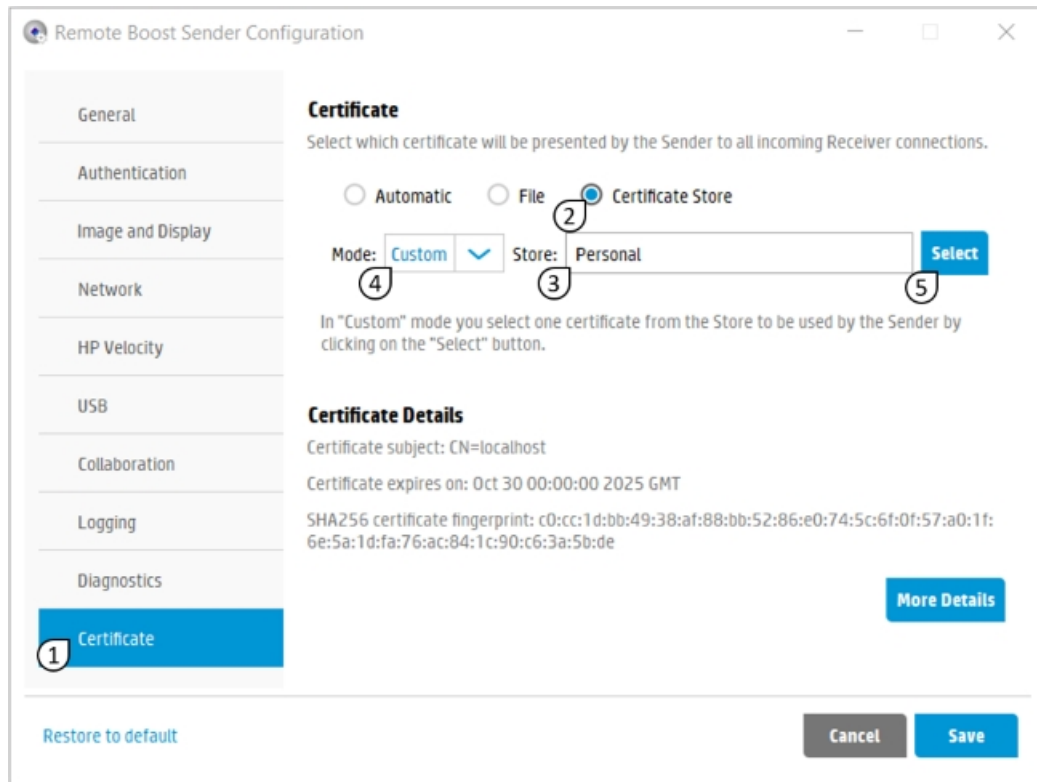


Table 6-3 Selecting a custom certificate from the Personal certificate store folder using the sender configuration tool

Item	Description
1	Certificate tab
2	Certificate Store radio button
3	Store field
4	Mode combo box
5	Select button

Configuring intermediate CAs from the certificate store

To configure intermediate CAs on the Windows sender, the intermediate CAs must be added to the `Intermediate Certification Authorities` folder in the `LocalMachine` certificate store of the Sender. For more information about how to add certificates to the Windows certificate store, see [Adding Certificates to the certificate store on page 41](#).

Configuring the receiver to accept a sender certificate signed by a CA

To accept signed certificates, the receiver must know the root CA used on the sender certificate chain. If you did not configure the intermediate CAs on the sender, then the receiver must also know all intermediate Certificate Authorities in the sender certificate chain.

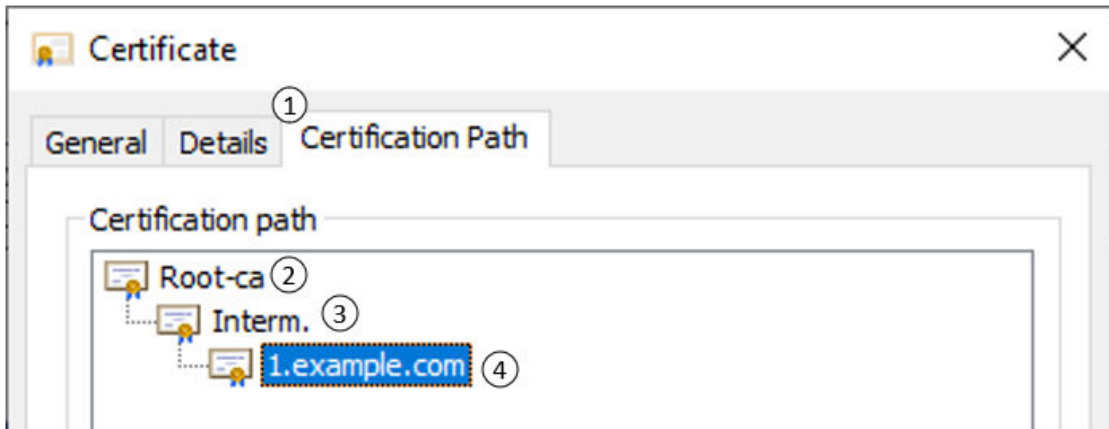


Table 6-4 Certificate chain example

Item	Description
1	Certification Path tab
2	Root CA (Certificate Authority)
3	Intermediate CA (Certificate Authority)
4	Sender certificate

Assume that a sender was configured to use a certificate that is signed by an intermediate certificate named `Interm.` and this intermediate certificate is signed by a root CA named `Root-ca`. To trust the sender certificate, the receiver will need to have local access to the `Root-ca` certificate. If the `Interm.` certificate was not configured on the sender, then the receiver will also need to have local access to it.

There are two places where the receiver can look for Certificate Authorities:

- The certificate store
- A certificate file

Configuring the receiver to look for CAs in the certificate store

By default, all receivers look for CAs in the certificate store. Adding a CA to the certificate store depends on the operating system.

- On Windows, the receiver will look for Root CAs (self-signed) in the `Trusted Root Certification Authorities` folder in the `CurrentUser` certificate store. If you did not configure the intermediate CAs on the sender, then the receiver will look for Intermediate CAs (not self-signed) in the `Intermediate Certification Authorities` folder in the `CurrentUser` certificate store.
- On Linux, the receiver will look for CAs in the platform certificate store.

- On macOS, the receiver will look for CAs in the login keychain and the system keychain.

For more information about how to add CAs to the certificate store, see [Adding Certificates to the certificate store on page 41](#).

Configuring the receiver to look for CAs in a CA file

If you configure the receiver to look for CAs in a CA file, then it no longer looks for CAs in the Certificate Store. The CA file must be in PEM format and must include the root CA. If you did not configure the intermediate CAs on the sender, then this file must also contain all the intermediate CAs. If the root CA and the intermediate CAs are in different files, use the `cat` command-line tool to concatenate them into a single file.

Follow these steps to configure the receiver to look for CAs in a CA file:

1. On the receiver system, open the `rgreceiverconfig` file. On Windows, the file is located in the receiver installation directory (default file path is `C:\Program Files\HP\Remote Graphics Receiver`). On Linux, the file is located in `/etc/opt/hpremote/rgreceiver`. On macOS, this file is located in `/Library/Application Support/HP/rgreceiver`.
2. Locate and modify the following line:

```
Rgreceiver.Network.CertificateVerification.CA.Path= FullPathToCaFile
```

where `FullPathToCaFile` is the full file path of a PEM format file that contains the Certificate Authorities used in the sender's certificate chain. If the intermediate CAs were configured on the sender, then this file only needs to contain the root CA. Otherwise, it needs to contain the root CA and all intermediate CAs concatenated in the same PEM file.

Other receiver properties related to certificate validation

The following properties influence the certificate verification process performed by the receiver. You can change them if you want to modify the default behavior.

- `Rgreceiver.Network.CertificateVerification.MaxChainSize`

This property controls the maximum certificate chain size that the receiver will accept. The default value is 4. The size count includes the sender certificate, the root CA as well as all the intermediate CAs. If your sender has three or more intermediate certificates, you must increase this value in the receiver config file.

- `Rgreceiver.Network.CertificateVerification.CA.Location`

This property controls which Certificate Store to search for CA files. The default value is `CurrentUser`. The other possible value is `LocalMachine`. Because the receiver runs as a user application, HP recommends that you use the default value. Certificates that are added to the `LocalMachine` store are usually available on the `CurrentUser` store as well.

- `Rgreceiver.Network.CertificateVerification.CheckName`

During the certificate verification process, the receiver tries to match the hostname that you are trying to connect to with the names on the sender certificate. If the hostname does not match any of the names registered on the certificate, then a verification error occurs.

Certificate name verification is enabled by default and can be disabled with this property. For enhanced security, HP recommends that you properly configure the sender certificate and do not disable this property on the receiver.

Adding Certificates to the certificate store

The sections below outline how to add certificates to the certificate store on Windows, Linux, and macOS.

Adding sender certificates and CAs to the Windows certificate store

There are several ways of adding CAs to the Windows certificate store. The following instructions use the MMC .exe utility that is a part of the Windows OS.

1. On the receiver system, run the MMC .exe utility.
2. Select **File**, and then select **Add/Remove Snap in**.
3. Select **Certificates** on the left side panel, and then select **Add**.
4. Select **My user account**, and then click **Finish**. Select **OK**.
5. Navigate to the correct folder on the left side panel, and then double-click the folder.
6. Right-click the **Certificates** subfolder, then select **All Tasks**, and then select **Import**.
7. Follow the wizard to finish importing the certificate.

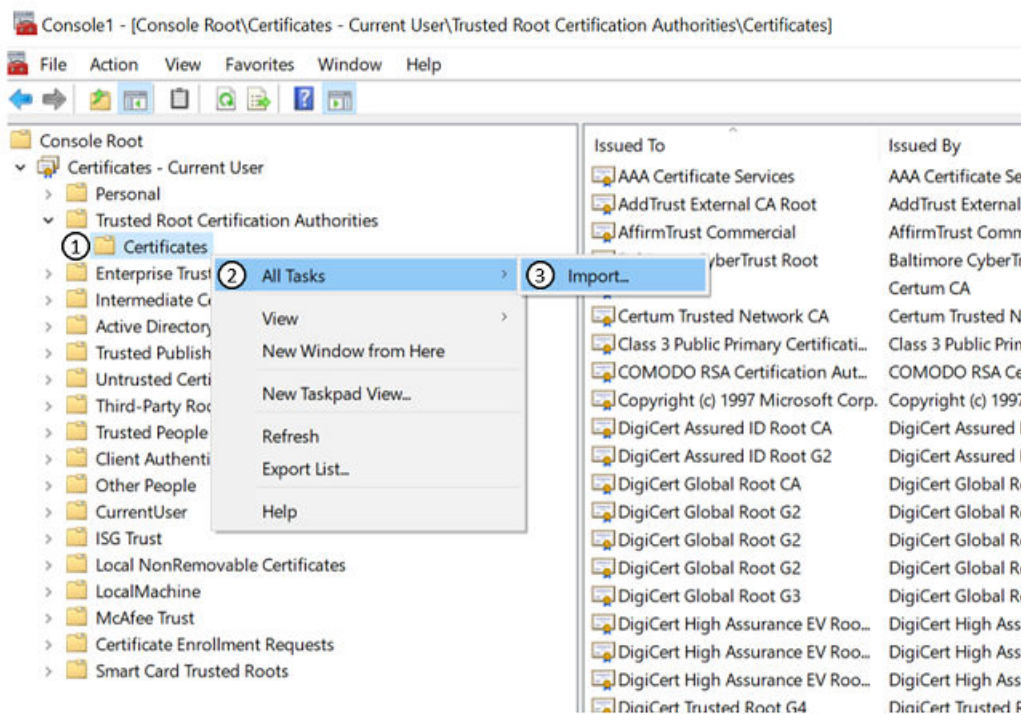


Table 6-5 Using MMC.exe to import a root certificate into the Trusted Root Certification Authorities store

Item	Description
1	Certificates subfolder
2	All Tasks menu item
3	Import menu item

Adding CAs to the Linux Certificate Store

Each Linux distribution has a file that it uses to store certificates and a set of shell commands that you use to add certificates to this file. Any certificate added to this file is available to all users. Each Linux distribution has different instructions for adding a certificate to the platform store file, as shown in the following steps. On all distributions, you must perform all steps as root.

Ubuntu

Use this procedure to add CAs to the Linux Certificate Store on Ubuntu.

1. Copy the PEM or CRT file to the `/usr/share/ca-certificates` directory.
2. If necessary, rename the file with a `.crt` extension.
3. Add the certificate to the list of certificates in the `/etc/ca-certificates.conf` file. Do not include the `/usr/share/ca-certificates` part of the path, but do include any further directories that have been added.
4. Run the shell command `update-ca-certificates`.

CentOS 7 or RHEL 7

Use this procedure to add CAs to the Linux Certificate Store on CentOS or RHEL.

1. Copy the PEM or CRT file to the `/etc/pki/ca-trust/source/anchors` directory.
2. Run the shell command `update-ca-trust extract`.

ThinPro

Use this procedure to add CAs to the Linux Certificate Store on HP ThinPro.

1. Run the shell command `fsunlock`.
2. Copy the PEM or CRT file to the `/usr/share/ca-certificates` directory.
3. If necessary, rename the file with a `.crt` extension.
4. Add the certificate to the list of certificates in the `/etc/ca-certificates.conf` file. Do not include the `/usr/share/ca-certificates` part of the path, but do include any other directories that have been added.
5. Run the shell command `update-ca-certificates`.
6. Run the shell command `fslock`.

Adding CAs to the macOS Certificate Store

The macOS Certificate Store is also known as **Keychain**. If you want the certificate to be available to the current user only, add it to the **login** keychain. If you want the certificate to be available to all users, add the certificate to the **System** keychain.

1. On the receiver system, open the **Keychain Access** application.
2. On the left side panel, select the keychain that you want to use.
 - If you select the **login** keychain, the certificate is installed for the current user.

- If you select the **System** keychain, the certificate is installed for all users.
3. Select **Certificates** on the top menu.
 4. From Finder, drag and drop the certificate file that you want to install in Keychain Access's right-side panel.

This process installs the certificate. However, on macOS, certificates are installed as untrusted by default, so you must modify its trust settings.
 5. Locate the certificate on the right-side panel, and double-click it.
 6. Change its trust settings to **Always Trust**.
 7. Close the window.

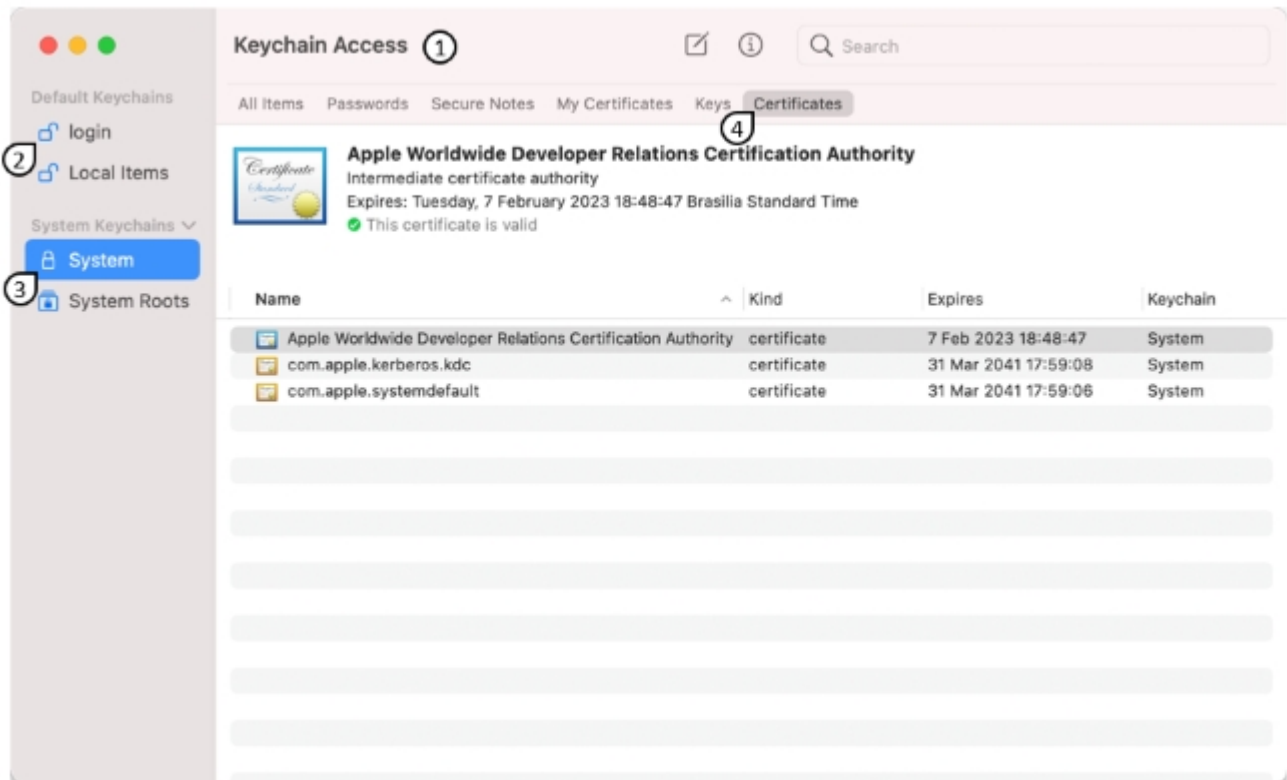


Table 6-6 The macOS Keychain Access application

Item	Description
1	Keychain Access application
2	login keychain
3	System keychain
4	Certificates tab on top menu bar

The System keychain is selected on the left-side panel, and **Certificates** is selected on the top menu. To add a certificate, simply drag a certificate file from Finder and drop it on top of the right-side panel.

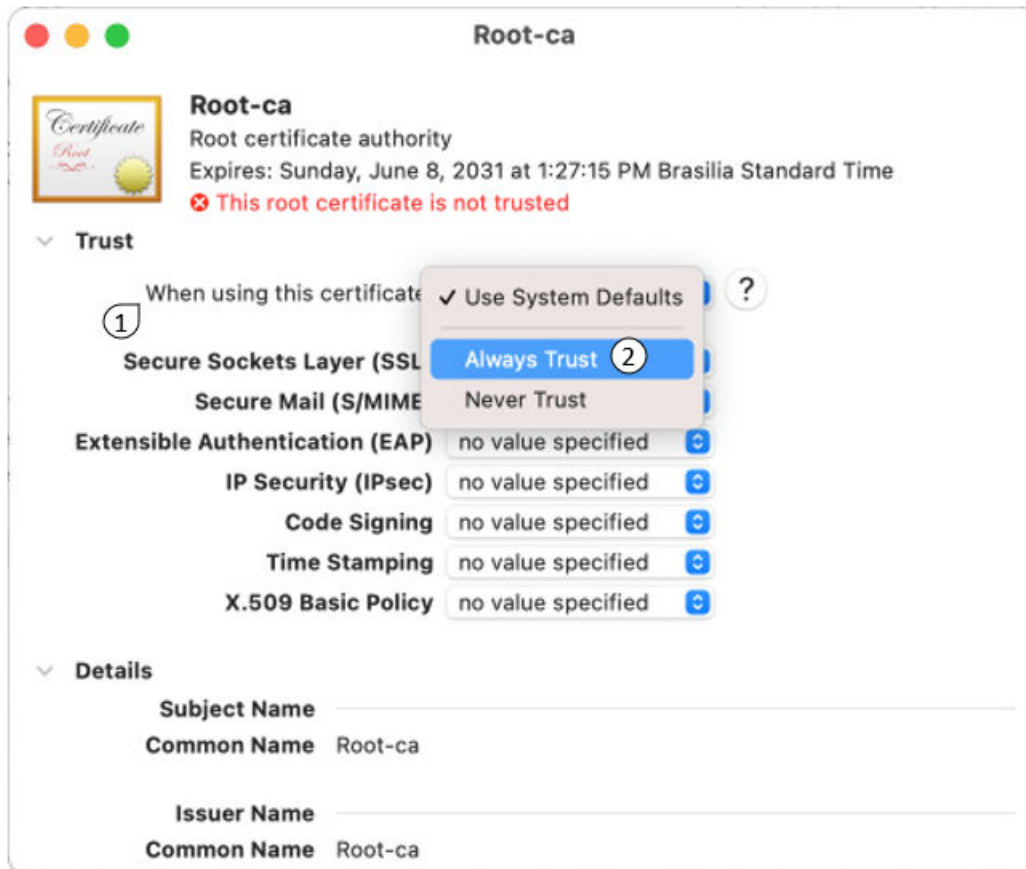



Table 6-7 Changing a certificate's trust settings

Item	Description
1	Certificate's trust settings
2	Always Trust option

Accepting or rejecting certificate errors

If certificate verification fails when connecting to a sender, you are notified about all the errors and given the following options regarding the connection.

- **Yes:** This option accepts the certificate for the current session only and connects to the sender.
- **No:** This option declines the sender certificate, and the receiver does not connect to the sender.
- **Always Accept:** This option accepts the certificate for the current session and caches the hostname and the sender certificate. If you try to reconnect to the same hostname and the sender presents the same certificate, the receiver automatically accepts the certificate. If you no longer want to automatically accept the certificate, you must remove the certificate from where it is cached.

 **NOTE:** Review the certificate errors listed in the dialog before selecting **Yes** or **Always Accept**.

Fatal certificate errors

There are a few certificate errors that are considered fatal. A connection cannot be allowed to proceed with a fatal error. The possible fatal errors are as follows.

- **Chain Too Long:** The length of the certificate chain exceeds that which is specified by `Rgreceiver.Network.CertificateVerification.MaxChainSize`. See [Other global properties on page 96](#)
- **Invalid Signature:** A signature in the certificate chain does not match the certificate.

It is possible to override all certificate errors by setting `Rgreceiver.Network.Certificate.VerificationPolicy` to **Allow** (See [General on page 77](#)). This is not recommended as potential security issues will be ignored.

Removing cached certificates

Remote Boost caches certificates when **always accept** is chosen from the certificate dialog. This prevents the certificate dialog from showing up on subsequent connections. If you no longer want this behavior, follow these steps to clear the cache on Windows, Linux, and macOS.

Windows

Follow this procedure to remove a cached certificate or clear all cached certificates on Windows.

1. Open the Registry Editor on the receiver system, and find the folder `HKEY_CURRENT_USER/Software/HP/KnownSenders`.
2. To remove a specific cached certificate, in the `KnownSenders` folder, delete the subfolder that matches the hostname of the certificate.
3. To clear all cached certificates, delete the `KnownSenders` folder.

Linux

Follow this procedure to remove a cached certificate or clear all cached certificates on Linux.

1. On the receiver system, go to the file named `$HOME/.config/HP/KnownSenders.conf`.
2. To remove a specific cached certificate, open the `KnownSenders.conf` file, and then delete the entry that starts with the host name of the certificate.
3. To clear all cached certificates, delete the `KnownSenders.conf` file.

macOS

Follow this procedure to clear all cached certificates on macOS.

1. On the receiver system, delete the file named `$HOME/Library/Preferences/com.hp.KnownSenders.plist`.
2. Restart the computer.

Troubleshooting the certificate configuration

To diagnose network or certificate configuration issues, set the Log level to `DEBUG` and set Ice properties in the sender or receiver Ice configuration files.

1. Open the `ICE config` file. On Windows, the file is located in the receiver or sender installation directory. On Linux, the file is located in `/etc/opt/hpremote/rgreceiver` or `/etc/opt/hpremote/rgsender`. On macOS, this file is named `iceconfig` and is located in `/Library/Application Support/HP/rgreceiver`.

2. Add the following settings:

- `IceSSL.Trace.Security={0 | 1}`

0: Security tracing is disabled.

1: Security tracing is enabled.

- `Ice.Trace.Network={0 | 1 | 2 | 3}`

0: Network tracing is disabled.

1: Network tracing is enabled during connection establishment and closure.

2: Network tracing is enabled during connection establishment and closure, with more detail logged.

3: Network tracing is enabled during connection establishment and closure, with more detail and data transfer logged.

- `Ice.Trace.Protocol={0 | 1}`

0: Protocol message tracing is disabled.

1: Protocol message tracing is enabled.

You can also verify if the sender is using the correct certificate and if the intermediate CAs are correctly configured on the sender side by using the `openssl` command line tool. The following line will display all the certificates that are configured on the sender:

```
openssl s_client -showcerts -connect hostname:42966
```

Change hostname and the network port accordingly.

7 Using HP ZCentral Remote Boost features

This chapter describes HP ZCentral Remote Boost features and topics.


HP ZCentral Remote Boost Advanced Features

This section discusses HP ZCentral Remote Boost Advanced Features.

Advanced Video Compression

Advanced Video Compression is an HP ZCentral Remote Boost Feature that enables the AVC (H.264) codec, instead of the HP3 codec, to reduce the network bandwidth for use cases like video, where large desktop areas are changing frequently.

Advanced Video Compression is ideal for video or 3D applications in textured mode. HP does not recommend it for use with wireframes or fine lines, because screen artifacts might open when in motion. You can enable Advanced Video Compression in the **Performance** panel of the HP ZCentral Remote Boost Receiver settings.

 **IMPORTANT:** System requirements for Advanced Video Compression might be higher than the base HP ZCentral Remote Boost system requirements. For more information, see [Finding more information on page 4](#) in *QuickSpecs*.

NOTICE: The performance of Advanced Video Compression for resolutions larger than full HD (1920 × 1080) varies depending on the content.

AVC activation

Advanced Video Compression requires a one-time activation that occurs on the receiver when the first HP ZCentral Remote Boost connection is established, and this activation requires internet access. If using a proxy server for your LAN, be sure that your proxy settings are configured correctly (see [Network on page 25](#)). Activation does not work with a proxy autoconfiguration (PAC) file or with the Web Proxy Auto-Discovery (WPAD) protocol.

The activation process uses https access to the activation.rgs.ext.hp.com URL (15.0.92.201). The receiver performs the activation for both the sender and receiver. Therefore, you must open port 443 for https on your proxy or firewall to allow activation.

Only the receiver needs online access to activate. During activation a file gets added to the sender and receiver. This file is stored in the following path for each OS:

Windows: `\ProgramData\HP\Remote Graphics Software\registration`

Linux and ThinPro: `/etc/opt/hpremote/registration`

macOS: `Library/Application Support/HP/rgreceiver`

For thin clients with a write filter, HP recommends disabling the write filter before the first HP ZCentral Remote Boost connection so that the files created during activation are permanently written to the hard drive. The write filter should be re-enabled afterward.


HP Velocity

HP Velocity is an HP ZCentral Remote Boost Advanced Feature that improves performance within a wide area network (WAN).

HP Velocity status is displayed on the HP ZCentral Remote Boost Receiver toolbar:

- Blue: HP Velocity is monitoring network loss and is ready to be used.
- Green: HP Velocity is actively working to improve network conditions.
- Grey: HP Velocity has not been activated.

 **NOTE:** HP Velocity might increase network bandwidth usage.

 **NOTE:** Certain system configurations might prevent HP Velocity from working. In that situation, HP Velocity is disabled. On macOS, HP Velocity needs the value of the system setting `maxsockbuf` to be at least 3 MB (3145728). You can check the current value by running the command `sysctl -n kern.ipc.maxsockbuf` on a terminal. If the current value is lower than 3145728, you can increase it by running the command `sudo sysctl -w kern.ipc.maxsockbuf=3145728` on a terminal.

Authentication

HP ZCentral Remote Boost supports several authentication methods and smart card redirection.

Authentication methods

There are three different authentication methods available for an HP ZCentral Remote Boost connection.

- **Standard authentication:** Supported for HP ZCentral Remote Boost Sender on Windows and Linux.
- **Easy Login:** Supported for HP ZCentral Remote Boost Sender on Windows and Linux.
- **Single Sign-on:** Supported for HP ZCentral Remote Boost Sender on Windows only.

On Windows, the authentication method is selected during installation of HP ZCentral Remote Boost Sender and can be changed later using the HP ZCentral Remote Boost Sender Configuration tool (see [HP ZCentral Remote Boost Sender Configuration tool \(Windows/Linux only\) on page 86](#)). Smart card redirection is supported for standard authentication and Easy Login (see [Smart card redirection on page 49](#)).

On Linux, Easy Login can be enabled during installation and disabled using an HP ZCentral Remote Boost Sender property (see [Other global properties on page 96](#)).

Standard authentication


To use standard authentication:

Standard authentication is the process by which a local user attempts to connect to a sender that has neither Single Sign-on nor Easy Login enabled.

In normal operation, users are required to authenticate twice when establishing an HP ZCentral Remote Boost connection from a receiver to a sender. The two steps are as follows:

1. The first authentication step is from HP ZCentral Remote Boost Receiver to HP ZCentral Remote Boost Sender. The dialog for this authentication step is generated and displayed by HP ZCentral Remote Boost Receiver on the receiver.

2. The second authentication step is when logging in to or unlocking the sender desktop session. The login or unlock dialog is generated by the sender and is displayed in the HP ZCentral Remote Boost Receiver window on the receiver.

 **NOTE:** If another user is already logged in to the sender, the second authentication step does not take place. Instead, the currently logged-in user receives an authorization prompt to allow or deny the new user access to join the existing desktop session (see [Collaboration on page 50](#) for more information).

When a Windows Receiver and Windows Sender are in the same workgroup and the same user name and password are used on both systems, the first authentication step will be accomplished using a secure token. The user will not be required to enter a password. To connect as a different user, enable the prompt for user name and password setting (for more information, see [HP ZCentral Remote Boost Receiver settings on page 23.](#))


Using Kerberos Authentication


When a Windows or Linux Sender is connected to a Windows domain, the first authentication step can be accomplished using Kerberos when using a Windows Receiver connected to the same domain.

The user is not be required to enter a password. Kerberos authentication to a Linux Sender requires a hostname to be entered as the Sender identifier. Kerberos authentication to a Linux Sender will not work with an IP address. To connect as a different user, enable the **Prompt for user name and password setting** (see [HP ZCentral Remote Boost Receiver settings on page 23.](#))

Easy Login

If you use Easy Login, the first authentication step (HP ZCentral Remote Boost authentication) is skipped.


 **NOTE:** At the login screen, you might see an additional user account named HP ZCentral Remote Boost ELO. Do not use this account to log in. Use your normal user account.

 **NOTE:** There are several issues that can prevent an Easy Login authentication. The Diagnostics panel of the HP ZCentral Remote Boost Sender Configuration tool can help troubleshoot these issues. See [HP ZCentral Remote Boost Sender Configuration tool \(Windows/Linux only\) on page 86](#) for more details.

Single Sign-on

With Single Sign-on, the second (System) authentication is skipped. When connecting, the user will be prompted for user name a password. Upon verification, the user will be connected directly to the sender's desktop.

 **NOTE:** Single Sign-on does not support smart card or ActivKey authentication.


 **NOTE:** If you lock the desktop, you might see an additional user account named HP ZCentral Remote Boost SSO. Do not use this account to log in. Use your normal user account.

Smart card redirection

When smart card redirection is enabled, both the receiver and sender can access the same smart card that physically exists on the receiver-side only. This means that you can unlock the receiver desktop using the smart card, connect to the sender, and then use the same smart card with the sender desktop.

 **NOTE:** Smart card redirection is supported on Windows-based receivers and Windows-based and Linux-based senders only.

On Windows-based and ThinPro-based receivers, smart cards can be remoted using Remote USB. See [Remote USB \(Windows and ThinPro only\) on page 69.](#)

 **NOTE:** Smart card redirection can be used with standard authentication or Easy Login only. It cannot be used with Single Sign-on.

Using smart card redirection

To use smart card redirection:

1. Enable smart card redirection during the installation of both HP ZCentral Remote Boost Receiver and HP ZCentral Remote Boost Sender (see [Installation on page 7](#)).
2. Install the vendor driver for the smart card reader on the receiver.
3. Install the vendor driver for the smart card on both the receiver and sender.
4. If Remote USB is enabled, see [Configuring Remote USB for smart card redirection on page 50](#).

 **NOTE:** If the smart card removal policy has been set on the receiver, the receiver desktop is locked if the smart card is removed. If the smart card removal policy has been set on the sender, the sender desktop is locked when the HP ZCentral Remote Boost connection is ended or when the smart card is removed.

Configuring Remote USB for smart card redirection

To prevent the smart card reader from being remoted:

Smart card readers typically connect to the system via USB, so you must prevent the smart card reader from being remoted by the Remote USB feature to use the smart card redirection feature.

- ▲ If you used the default Remote USB installation option **USB devices are Local/Remote** when installing HP ZCentral Remote Boost Receiver, connect the smart card reader to the receiver before starting an HP ZCentral Remote Boost session, and do not disconnect the smart card reader during the session.

– or –

Set the remoting behavior of the smart card reader to `local` (see [Configuring the remoting behavior of individual USB devices \(Windows only\) on page 69](#)).

Limitations

Consider the following limitations when using smart card redirection:

- Smart card redirection is limited to the primary user.
- Smart card redirection is limited to the first smart card detected by the receiver. If there are two or more smart cards, including virtual smart cards, enabled on the receiver, smart card redirection might not be predictable.
- Disconnecting and reconnecting a smart card reader during an HP ZCentral Remote Boost session causes the smart card reader to be remoted via Remote USB. In this situation, the receiver no longer sees the smart card reader or smart card. If the smart card removal policy is enabled, the receiver desktop locks.

Collaboration

HP ZCentral Remote Boost enables the primary user to share their desktop session with several users simultaneously. You can use this feature in a variety of collaborative scenarios including classroom instruction, design reviews, and technical support.

You can create a collaboration session when one or more users are authorized by the primary user to connect to the primary user's desktop session. This allows all users to view and interact with the primary user's desktop.

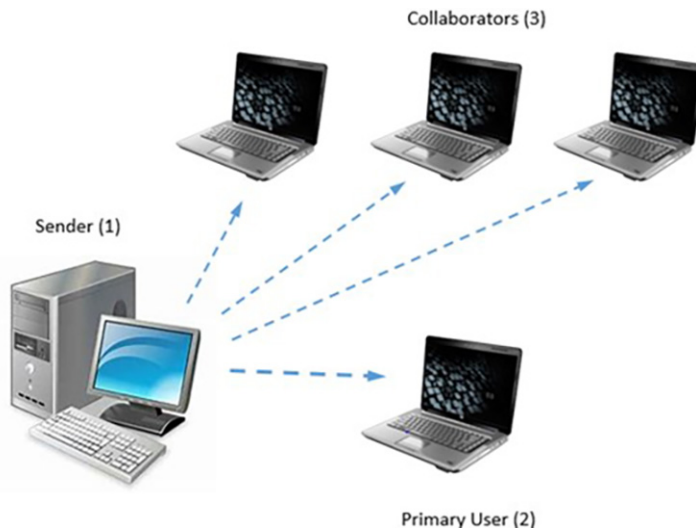


Table 7-1 Collaboration session items and their descriptions

Item	Description
1	Sender: Hosts HP ZCentral Remote Boost Sender, which transmits the sender desktop session to the HP ZCentral Remote Boost Receiver on each receiver.
2	Primary user: The primary user is logged into the sender and has control over the session. The primary user authorizes who can join and actively participate in the session.
3	Collaborators: Collaborators, once authorized, can view the sender's desktop and make changes as permitted by the primary user.

NOTE: The image above is just an example of one possible configuration. The primary user and collaborators can use any combination of hardware supported by the HP ZCentral Remote Boost Receiver.

The user currently controlling the mouse and keyboard is called the floor owner. Only one user, the floor owner, can interact with the desktop at a time. To transition the floor owner, the current floor owner must cease using the keyboard or mouse for 0.5 seconds. If another user uses the mouse or keyboard while the current floor owner is inactive after this period, floor ownership transfers to the new user.

TIP: The delay's value of 0.5 seconds can be changed using the HP ZCentral Remote Boost Sender Configuration tool on Windows® (see [HP ZCentral Remote Boost Sender Configuration tool \(Windows/Linux only\) on page 86](#) for more information).

Select the HP ZCentral Remote Boost Sender notification icon in the Windows notification area to open the HP ZCentral Remote Boost Collaborators window, which allows you to do the following:

- View who the primary user and collaborators are.
- Enable or disable collaborator input for individual collaborators or all collaborators at once by clicking the appropriate mouse pointer icon.

TIP: You can also enable individual collaborator input when authorizing the collaborator to connect by selecting **Enable Input for this user** in the authorization dialog.

- Disconnect individual collaborators or all collaborators at once by clicking the appropriate **X** icon

Note the following additional information about collaboration:

- Collaboration requires unique login credentials on the sender for each participant.
- If guest accounts are enabled in Windows, a collaborator can join by using "Guest" as the user name and leaving the password blank. However, only one guest collaborator can join at a time. If another guest collaborator joins, the first one is kicked out of the session.
- On Windows, if the primary user disconnects, the desktop is locked, but all collaborators remain connected. On Linux, if the primary user disconnects, the desktop is locked, and all collaborators are disconnected.
- The update rate of all collaborators is limited by the lowest update rate of any one collaborator. Collaborators with low update rates can use the **Performance** panel in the HP ZCentral Remote Boost Receiver settings to improve their update rate, which improves the experience for all collaborators.
- To collaborate in a session that has Advanced Video Compression or HP Velocity enabled, each collaborator must have the same Advanced Video Compression and HP Velocity settings on their HP ZCentral Remote Boost Receiver, or the connection will be refused.

Collaboration invitations

You can invite other users to either new collaboration sessions or sessions in progress.

Collaboration invitations can be generated in the HP ZCentral Remote Boost Collaborators window by selecting the **copy to clipboard** button. Invitations are copied to the clipboard and can be pasted into an email or messaging app to send them to the other users.

Invitations contain brief instructions to help the invited users connect to the sender, including the host name of the sender machine and a list of IP addresses that can be used.

By default, only global addresses are displayed. To change this default behavior, modify the value of the HP ZCentral Remote Boost Sender `sender_gui.Invitation.FilterPrivateAddresses` configuration property (see [Setting HP ZCentral Remote Boost properties manually on page 93](#)). Setting this property to 1 (the default) filters private addresses. Setting it to 0 displays private addresses in the list.

Active Collaboration Notification

Active Collaboration Notification highlights all screens that connected receivers view during an active collaboration session so that you can tell when other collaborators are viewing your screens.

Each screen being sent to a collaborator is highlighted with a border that you can configure via the sender configuration tool. See [Collaboration on page 91](#) for more information.

This feature is enabled by default but can be disabled from the Sender Configuration file and Sender Configuration GUI. When enabled, the screen notifications persist during the current collaboration session but can be toggled on and off from Sender GUI.

Display

You can configure several display settings.

Display resolution and layout matching

Many HP ZCentral Remote Boost scenarios require that the resolution and display layout transmitted by the sender match the display configuration on the receiver. The following sections describe how to configure the sender if HP ZCentral Remote Boost is unable to match the resolution and display layout by default.

Multi-monitor overview


During an HP ZCentral Remote Boost connection, HP ZCentral Remote Boost transmits the sender's entire desktop area to the receiver. If the sender has more monitors or higher-resolution monitors than the receiver, scroll bars appear in the HP ZCentral Remote Boost Receiver window so that you can view the sender's entire desktop area.


If the sender has multiple monitors, it might be beneficial to use the options described in [Matching display resolution and layout \(Windows-based sender\) on page 55](#) or [Matching display resolution and layout \(Linux-based sender\) on page 58](#).



Multiple monitors on the receiver are also useful for a many-to-one connection. If the receiver is connected to two senders, each sender frame buffer can be displayed on its own monitor if the receiver has two monitors (see the following image).



 **NOTE:** On macOS, to allow a Receiver window to span multiple monitors, HP recommends that you do not select the **Displays have separate Spaces OS** option. To change this setting, open **System Preferences**, and then select the **Mission Control** preference pane.

 **NOTE:** On macOS, selecting the following settings can improve the usability of the Receiver, especially if the Receiver window covers the entire screen. Under **System Preferences**, select **Dock**, and then select **Automatically hide and show the Dock**. Then, under **System Preferences**, select **General**, and then select **Automatically hide and show the menu bar**.


Matching display resolution and layout methods

There are three ways to have HP ZCentral Remote Boost automatically configure the sender's display resolution and layout:

- **Per-session display properties:** Per-session display properties can be set in the configuration file or used in an auto-launch file. See [Auto-launch properties on page 100](#). The per-session display properties can be used to describe the resolution, position, and orientation of one or more displays. Each display has the following fields where <n> is the session number and <x> is a display number:

- `Rgreceiver.Session.<n>.Display.<x>.X`
- `Rgreceiver.Session.<n>.Display.<x>.Y`
- `Rgreceiver.Session.<n>.Display.<x>.Width`
- `Rgreceiver.Session.<n>.Display.<x>.Height`
- `Rgreceiver.Session.<n>.Display.<x>.Orientation`

 **NOTE:** For more information about these properties and their expected values, see [Using display properties to set resolution and layout on page 60](#).

 **NOTE:** If any per-session display property is in the configuration file, HP ZCentral Remote Boost disables the **Set Sender display(s) to match Receiver display(s)** and the **Set Sender display(s) to match display properties** settings.

- **Set Sender display(s) to match Receiver display(s):** If the **Set Sender display(s) to match Receiver display(s)** setting is enabled, HP ZCentral Remote Boost automatically tries to set the resolution and display layout of the sender to match that of the receiver.

You can also control this function with the following property:

- `Rgreceiver.IsMatchReceiverResolutionEnabled`

- **Set Sender display(s) to match display properties:** If the **Set Sender display(s) to match display properties** setting is enabled, HP ZCentral Remote Boost automatically tries to set the resolution and display layout of the sender to match the specified display properties.

 **NOTE:** The **Set Sender display(s) to match display properties** option is disabled if no display properties were found in the configuration file.

The display properties can be used to describe the resolution, position, and orientation of one or more displays. Each display has the following fields where <x> is a display number:

- `Rgreceiver.Display.<x>.X`
- `Rgreceiver.Display.<x>.Y`
- `Rgreceiver.Display.<x>.Width`
- `Rgreceiver.Display.<x>.Height`
- `Rgreceiver.Display.<x>.Orientation`

 **NOTE:** For more information about these properties and their expected values, see [Using display properties to set resolution and layout on page 60](#).

You can also enable the **Set Sender display(s) to match display properties** with the `Rgreceiver.UseDisplayProperties` property.

Matching display resolution and layout (Windows-based sender)

When attempting to match the resolution and display layout, the most important thing to remember is that the sender must support the same resolution and layout as the receiver.

Testing the resolution

To avoid possible resolution-matching problems, test the resolution in advance using the following procedure:

1. Establish an HP ZCentral Remote Boost connection with the **Do not change the sender display(s)** setting enabled.
2. When the connection is established, manually attempt to set the sender's resolution to match the receiver's resolution.

If you can match the resolution, then HP ZCentral Remote Boost can also do it for you automatically.


Additional configuration on the sender

Depending on the NVIDIA® GPU and driver you are using, you might need to perform additional configuration on the sender. The required configurations can vary depending on the hardware, described as follows:

- **Blade workstation:** If the sender is a blade workstation, then its NVIDIA driver exposes all display outputs to the operating system as if they have monitors attached. The resolutions provided by the NVIDIA driver cover a broad range of settings and should meet most user needs. If the resolution you want is not available, see [Adding custom resolutions on page 57](#).
- **Virtual Workstation:** If the sender is a Virtual Workstation with a hypervisor, the NVIDIA driver presents a single display to the operating system. The resolutions provided by the NVIDIA driver cover a broad range of settings and should meet most user needs. If you are using a single display at the receiver, no further action is required. If you need to configure additional resolutions and/or make additional displays available, see [NVIDIA resolution-matching \(Windows-based senders with NVIDIA graphics only\) on page 56](#).
- **Traditional workstation:** If the sender is a traditional workstation, then its NVIDIA driver expects to find a display attached to one or more outputs. When it does, it queries the EDID (Extended Display Information Data) information from the display for its supported resolutions and makes the display and resolutions available to the operating system. On Windows 7, if there is not a display attached, the NVIDIA driver reverts to a single VGA output with basic display resolutions. For servers, rack-mounted workstations, and non-NVIDIA graphics, use an EDID emulator device or create an EDID file to allow resolution matching. See [Creating and applying an EDID file on page 56](#) and [Matching display resolution and layout \(Windows-based sender\) on page 55](#) for more information. Alternatively, HP ZCentral Remote Boost loads EDID files automatically. See [NVIDIA resolution-matching \(Windows-based senders with NVIDIA graphics only\) on page 56](#).
- **Headless workstation:** When connecting to a workstation that has no physical displays connected, HP ZCentral Remote Boost requires that an EDID be loaded first. You can configure HP ZCentral Remote Boost to automatically load a custom EDID, which supports most resolutions up to 4k. To enable automatic EDID loading on headless workstations with an NVIDIA Quadro® GPU:
 1. In `rgsenderconfig`, set `Rgsender.Compatibility.Displays.ForceEdidOnHeadless` to 1.
 2. Restart the HP ZCentral Remote Boost Sender service.

– or –


Restart the sender.

 **NOTE:** This property only applies an EDID to a system if it is headless when the HP ZCentral Remote Boost Sender service opens. If the workstation is not headless when the HP ZCentral Remote Boost Sender service opens, then no EDID is loaded.


NVIDIA resolution-matching (Windows-based senders with NVIDIA graphics only)

NVIDIA resolution-matching provides the following additional features over the default resolution-matching method:

- Automatic loading and unloading of EDID files to allow a sender with fewer monitors than the receiver to "fake" displays


 **NOTE:** This is especially useful for Virtual Workstations where the hypervisor typically provides only one display.


- Rotated monitors on virtualized systems (specifically, Citrix® and VMware® virtual machines)
- Automatic application of custom resolutions on virtualized systems

 **NOTE:** If NVIDIA resolution-matching fails to match the requested resolution/resolutions, HP ZCentral Remote Boost attempts the default resolution-matching method.

To enable NVIDIA resolution-matching:

1. In `rgsenderconfig`, set `Rgsender.Compatibility.Displays.AllowNvidiaResolutionMatching` to 1.
2. Restart the HP ZCentral Remote Boost Sender service.
– or –
Restart the sender.

 **NOTE:** For more information about setting the property, see [Setting property values in a configuration file on page 94](#).

 **NOTE:** NVIDIA resolution-matching is enabled by default on Windows 10 Redstone 1 and later but must be enabled on Windows 7, Windows 8.1, and Windows 10 pre-Redstone.

EDID files

Extended Display Identification Data (EDID) data is a standardized means for a display to communicate its capabilities, such as resolution and video characteristics, to a source device.

This allows the source device (PC, graphics card) to generate the necessary graphics that match the needs of the system. EDIDs provide a powerful and convenient method for HP ZCentral Remote Boost to manage complex customer requirements.

Creating and applying an EDID file

There are software tools available to create and edit an EDID file, but the easiest method is to use an existing monitor from the receiver, temporarily attaching it to the sender and using the NVIDIA Control Panel to export the EDID file.

If you have several different displays that you use on the receiver, HP recommends that you capture the EDID information of the monitor that has the highest display resolution. This will address all other resolution needs.

Creating an EDID file

To create an EDID file:

1. Attach a monitor to the sender or the receiver.


 **NOTE:** This is not possible with blade workstations that use MXM graphics.

2. Open the NVIDIA Control Panel and select **View system topology**.
3. Find and select **EDID** for the connected monitor.
4. The **Manage EDID** dialog box opens. Select the tab labeled **Export**.
5. Select a display and select **Export EDID** and save the output to a file. This file can be imported on the sender system.

Importing an EDID file

To import an EDID file:

1. On the sender system, under **View system topology** select **EDID** on the connector port you want to use.
2. In the **Manage EDID** dialog box, select the **Load** tab, **Browse**, and select the EDID file that you created.
3. Under **Connector** select the port (DVI, DisplayPort™) that you want to use for the EDID monitor.
4. Select **Load EDID**. The EDID information is applied.
5. Select **OK** and then select **cancel** to close the **Manage EDID** dialog box.

 **NOTE:** If you apply the file to multiple DisplayPort connectors, HP ZCentral Remote Boost can able to support multidisplay configurations.

Under the View System Topology screen of the NVIDIA Control Panel, you should now be able to see that an EDID file is applied to the DisplayPort connectors that you selected. HP ZCentral Remote Boost can now match the specified display resolution and display layout.

Adding custom resolutions

To add a resolution that is not already supported by the NVIDIA driver:

1. Open the NVIDIA Control Panel and select **Change Resolution**.
2. Select **Customize**.
3. Select the **Enable resolutions not exposed by the display** check box, and then select **Create Custom Resolution**.

 **NOTE:** If a warning appears, accept it.

4. Add the custom resolutions.

Matching display resolution and layout (Linux-based sender)

When attempting to match the resolution and display layout, the sender must support the same resolution and layout as the receiver. If the resolution is not supported, HP ZCentral Remote Boost instead uses the preferred resolution of the sender from the file `xorg.conf`.

For example, if the receiver has dual monitors set at a 1280 × 1024 resolution, HP ZCentral Remote Boost asks the sender to set its resolution to 2560 × 1024. If the resolution is not supported, HP ZCentral Remote Boost instead uses the preferred resolution of the sender from the file `xorg.conf`.

The easiest way to check whether the sender can match the receiver resolution is to attempt to set the resolution on the sender manually. If you can set the resolution manually, then HP ZCentral Remote Boost can do it for you automatically. If you cannot set the resolution manually, you must modify the file `xorg.conf` to support the additional required resolutions.

To test whether you can match the resolution manually, establish an HP ZCentral Remote Boost connection with the **Do not change the sender display(s)** setting enabled.

After you establish an HP ZCentral Remote Boost session, open an X terminal window and use the `xrandr` tool to list all the currently supported resolutions for the X server. You can also use the tool to configure the X server display settings, including size and orientation.

Previous releases of the X Window System used the file `/etc/X11/xorg.conf` to store initial setup information. When a change occurred with the monitor or video card, you were required to edit the file manually. Although current releases of Red Hat® Enterprise Linux® (RHEL) have largely automated the process, you still need to edit the file to support configurations where no monitor is attached or where you want the X server to simulate that it has a different monitor attached to it with different resolution capabilities. Similarly, this is also the case when you want to match the receiver's resolution in an HP ZCentral Remote Boost session where the X server cannot determine the capabilities of the receiver's monitors.



NOTE: Some window managers (such as GNOME) allow you to modify display preferences, which can sometimes result in the creation of the following file:

```
$HOME/.config/monitors.xml
```

When you log in to the system and a window manager starts a session, it uses information from this file to set the current desktop resolution. This can reverse the resolution matching performed by HP ZCentral Remote Boost and cause the desktop to be set to an inappropriate resolution.

For example, if you set the desktop resolution of the sender to 1024 × 768 using a window manager, that resolution is stored in `monitors.xml`. If an HP ZCentral Remote Boost connection is then established with display resolution matching enabled on a receiver with a resolution of 1920 × 1200, the sender display resolution changes to 1920 × 1200 and then to 1024 × 768. There is no notification that the resolution match request failed (because it did not).

To avoid this behavior, avoid setting the resolution using window manager controls. It is safe to delete `monitors.xml` to restore display resolution matching functionality. See the documentation for your operating system or window manager for more information about where and how it manages display settings.

Configuring the X server

The X server can be configured in several different ways.

Scenario 1: All receivers have the same configuration

If all receivers have the same configuration, then using the **Virtual** entry under the **Screen** section of the file `xorg.conf` is the easiest method.

For example, if all receivers have four monitors configured at 1280x1024 each, configure the X server to run at a resolution of 5120x1024 by making the following additions to the file `xorg.conf`.

Add the following under the **Device** section:

```
Option "UseDisplayDevice" "none"
```

```
Option "UseEDID" "false"
```

Add the following under the **Screen** section:

```
SubSection "Display"
```

```
Virtual 5120 1024
```

```
Depth 24
```

```
EndSubSection
```

Now the X server is configured to have a single screen running at a resolution of 5120 × 1024, which covers all four of the receiver's monitors. You can use this method to support a very large virtual display limited only by frame buffer memory.

Scenario 2: Some receivers have different configurations

In the more likely scenario where you need to support many display resolution and monitor configurations, you can configure the X server to think it has the monitor with the highest resolution used on any of the receivers. This allows the X server to support as many display resolutions as possible.

You do this by capturing the EDID information from the monitor (see [Creating an EDID file on page 59](#)) and making the following additions to the file `xorg.conf`.

The following example uses dual HP LP2465 displays. The following text is added under the **Device** section of `xorg.conf`:

```
Option "ConnectedMonitor" "DFP-0,DFP-1"
```


```
Option "CustomEDID" "DFP-0:/etc/X11/lp2465edid.bin;DFP-1:/etc/X11/lp2465edid.bin"
```


To see which ports to use to handle higher resolutions, see the `Xorg.0.log`. If you have AMD graphics or the EDID file sent to the X server fails, you can use an EDID emulator.

Creating an EDID file

To create an EDID file:

- ▲ Use the NVIDIA tool `nvidia-settings` to create an EDID file in either `.bin` or `.txt` format.

 **IMPORTANT:** A physical display must be attached before you can use the NVIDIA tool.

 **TIP:** You can also use the method for Windows described in [Creating and applying an EDID file on page 56](#) and copy the EDID file to the Linux system.

Using display properties to set resolution and layout

You can use the display properties to describe the resolution, position, and orientation of one or more displays.

You can configure each display using the following fields:

- **X:** The X position of the upper-left corner of the display.
- **Y:** The Y position of the upper-left corner of the display.
- **Width:** The width of the display.
- **Height:** The height of the display.
- **Orientation:** The orientation of the display. Can be one of the following values:
 - **0:** Landscape
 - **1:** Portrait
 - **2:** Landscape (flipped)
 - **3:** Portrait (flipped)

 **NOTE:** If a field is not specified, the default value is 0.

For the display properties to be valid, the following conditions must be met:

- There must be at least one display specified.
- Display numbers must start at 1 and be sequential.
- One display must be at the origin where X=0 and Y=0.
- Each display's width and height must be greater than 0.
- A display's width must be greater than its height when its orientation is Landscape or Landscape (flipped).
- A display's height must be greater than its width when its orientation is Portrait or Portrait (flipped).

When more than one display is specified, the additional conditions must be met:

- No display can overlap another display.
- All displays must be adjacent to at least one other display. This means that all displays must be one X or Y position away from another display along one of the display edges.

The display properties are validated during the connection attempt. If this validation fails, an error dialog box is displayed and the connection uses the sender's current configuration.

For example, see the following display properties. These properties define two 1920 × 1200 displays that are positioned side by side.

```
Rgreceiver.Display.1.X=0
```

```
Rgreceiver.Display.1.Y=0
```

```
Rgreceiver.Display.1.Width=1920
Rgreceiver.Display.1.Height=1200
Rgreceiver.Display.1.Orientation=0
Rgreceiver.Display.2.X=1920
Rgreceiver.Display.2.Y=0
Rgreceiver.Display.2.Width=1920
Rgreceiver.Display.2.Height=1200
Rgreceiver.Display.2.Orientation=0
```

Sender screen blanking

HP ZCentral Remote Boost Sender, by default, blanks the screen of the sender monitor (if one is connected) so that the desktop session is not visible on the sender side.



IMPORTANT: Screen blanking is not supported if the sender is a virtual machine.

The default behavior is that the sender screen, with the exception of the cursor, blanks to black when you start an HP ZCentral Remote Boost session. The sender screen is displayed after the HP ZCentral Remote Boost session is ended.

See the following additional information about HP ZCentral Remote Boost Sender screen blanking:

- There might be a delay of up to 2 seconds after an HP ZCentral Remote Boost session is started before the sender screen is blanked.
- If, for any reason, HP ZCentral Remote Boost Sender is unable to blank the sender screen, a warning dialog is displayed on the receiver.
- If the sender is an HP workstation, then most input from any physically connected keyboards or mice at the sender side is blocked while screen blanking is occurring. When HP ZCentral Remote Boost Sender receives keyboard or mouse input from HP ZCentral Remote Boost Receiver, the sender monitor enters a power-saving mode, which blanks the cursor as a result.
- The **ctrl + alt + del** key sequence is not blocked by HP ZCentral Remote Boost Sender for any physically connected keyboards at the sender side. When this sequence is input into the sender using a physically-connected keyboard, the Windows logon screen of the remote desktop is displayed at the receiver side in the HP ZCentral Remote Boost Receiver window. The sender monitor remains blank while this occurs, but the monitor will exit its power-saving mode, and sender keyboard input is not blocked until the logon screen is closed.
- Screen blanking can be disabled using the HP ZCentral Remote Boost Sender Configuration tool (see [HP ZCentral Remote Boost Sender Configuration tool \(Windows/Linux only\) on page 86](#)).

Input

Supported input devices and methods include Wacom, Gestures (Windows touch capable devices only), Game Mode, and all keyboard layouts.

Wacom solution

The HP Remote Boost Receiver (Windows, macOS, RHEL, and Ubuntu) now supports Wacom pen displays and pen tablets when used with a Remote Boost Sender.

Adjusting tablet properties

You can make adjustments to Wacom display mapping, Express Key buttons, and pen buttons on the receiver system.

Use the following on the receiver to adjust settings and to verify that the pen is working properly:

- Windows: **Wacom Tablet Properties** application.
- macOS: **Wacom Tablet controls** under **System Preferences**.
- Linux: **Wacom Tablet controls** under the **Devices** section of **Settings**.

Windows and macOS receiver solution

Wacom drivers must be installed on the receiver system.

Consider disabling the Remote USB feature on the receiver. If the Wacom USB connection is made after the Remote Boost connection is established, the Wacom device is captured and exported to the sender. HP does not recommend this setup, because it bypasses the Remote Boost Wacom solution.

You can use Wacom Tablet controls to specify application-specific behavior on the receiver. This feature is not supported for sender applications, because Wacom controls are not available on the sender. Changing Wacom Tablet controls on the receiver will apply to all sender applications.

Consider disabling touch (if supported) on the Wacom device. Having touch enabled can cause the receiver to use the touch interface, or it might cause interference with pen events.

ThinPro receiver Solution

The usage of Remote USB and the usage of a Wacom pen are mutually exclusive. To enable the usage of a Wacom pen, open the USB Manager as a privileged user in the ThinPro Control Panel, and set the USB protocol to Local.



NOTE: A Wacom pen does not follow floor control in a collaboration session. Multiple users attempting to simultaneously provide any kind of input might experience unwanted behavior.

Linux receiver solution (non-ThinPro)

When installing the Remote Boost receiver, do not use the `-legacyWacom` installer flag or answer `yes` when prompted to enable Legacy Wacom support. These commands enable the older Linux Wacom solution, which works only from Linux receivers to Linux senders.



NOTE: This does not include ThinPro. See [ThinPro receiver Solution on page 62](#) for more information.

Windows sender solution

Wacom drivers are not required on the sender system. If they are installed, the Wacom Tablet controls do not show the device as being connected. You must make any adjustments to the Wacom device on the receiver system.

Configure applications on the sender using Windows Ink. Some applications use only the Wacom Wintab API rather than Windows Ink and do not work with this solution. Most pen-enabled applications use Windows Ink

by default or can be configured to use Windows Ink. Updated versions of pen-aware applications tend to have better support for Windows Ink.

When using the pen for input on the sender, the cursor is often displayed as a small dot. This is expected behavior.


Windows has a setting to hide the pen cursor. Use **Pen & Windows Ink** controls in **Windows Settings** to specify definite behavior.

Linux sender solution

Wacom Tablet controls on the sender do not show the device as being connected. Make adjustments to the Wacom device on the receiver system.

Some GTK-based applications require manual configuration to enable the virtual Wacom device. It appears on configuration menus as **Remote Boost Wacom Tablet**. One common application where this is necessary is the image manipulation program GIMP.

1. To enable the virtual Wacom device in GIMP, select **Edit > Input Devices**.
2. From the popup window that appears, select **Remote Boost Wacom Tablet eraser** and set the mode to **Screen**.
3. Repeat the previous step for the **Remote Boost Wacom Tablet stylus**.

 **NOTE:** Setting the device mode to **Window** could result in a cursor offset.


This configuration step should only be necessary the first time you use the virtual with this application.

Other applications might have different menus to enable the virtual device.


Using touch features (Windows touch-capable devices only)

HP ZCentral Remote Boost supports touch features that are outlined in this section.

- **Gestures**—See the following table for more information.
- **Virtual keyboard and virtual mouse**—You can access the virtual keyboard and virtual mouse from the HP ZCentral Remote Boost Receiver toolbar. The virtual mouse provides a visual indication of the remote cursor position, which is normally not present in the tablet GUI. The virtual mouse is useful when precise cursor positioning or hovering is required.

 **TIP:** You can enable and disable the virtual mouse also by using the four-finger tap gesture.

- **Hotkey sequence mapping**—See [Gestures \(Windows touch-capable devices only\) on page 24](#) for more information.

 **NOTE:** HP ZCentral Remote Boost does not support touch features for Windows 7.

The following table describes the gestures supported by HP ZCentral Remote Boost.


 **IMPORTANT:** A **press** is 0.5 seconds or more, and a **tap** is less than 0.5 seconds.

Table 7-2 Gestures and their descriptions

Gesture	Description
1-finger tap	Left-click

Table 7-2 Gestures and their descriptions (continued)

Gesture	Description	
1-finger double tap	Double-click	
1-finger press and drag	Left-click and drag	
2-finger tap	Right-click	
2-finger press and drag	Right-click and drag	
2-finger pinch/spread	Zoom out/in	
	NOTE: The zoom snaps to 100% if you close it after you lift your fingers.	
2-finger drag	Pan (when zoomed in)	
3-finger swipe or drag	Scroll wheel	
4-finger tap	Enable or disable the virtual mouse	
4-finger press and drag	Center-click and drag	
1-finger press	These gestures can be customized. See Gestures (Windows touch-capable devices only) on page 24 for more information.	
1-finger swipe left		
1-finger swipe right		
1-finger swipe up		
1-finger swipe down		
3-finger tap		
3-finger press		
4-finger press		
		TIP: For a graphical demonstration of these gestures, select the Gestures panel in the HP ZCentral Remote Boost Receiver settings, and then select See gestures tutorial .
		NOTE: Some gestures are disabled when the virtual mouse is enabled.
	NOTE: On some applications, swipe-based gestures might not work correctly. If that happens, HP recommends using the tap or touch-based gestures instead.	

Game Mode

Game Mode lets you lock the cursor inside the HP ZCentral Remote Boost Receiver window to perform functions that rely on relative cursor movements, such as 3D environment interaction. If Game Mode is not enabled, such interactions might cause erratic cursor behavior.

You can set the default state of Game Mode (enabled or disabled) with the HP ZCentral Remote Boost Receiver Configuration tool or Receiver Configuration File. You can toggle game mode on and off while HP ZCentral Remote Boost Receiver is in Setup Mode by pressing the **G** key.

Supported keyboard layouts

All keyboard layouts and languages are supported.

Remote Audio

Remote Audio allows audio generated by the sender to play back on the speakers of the receiver.

HP ZCentral Remote Boost audio path

This diagram illustrates the HP ZCentral Remote Boost audio path.

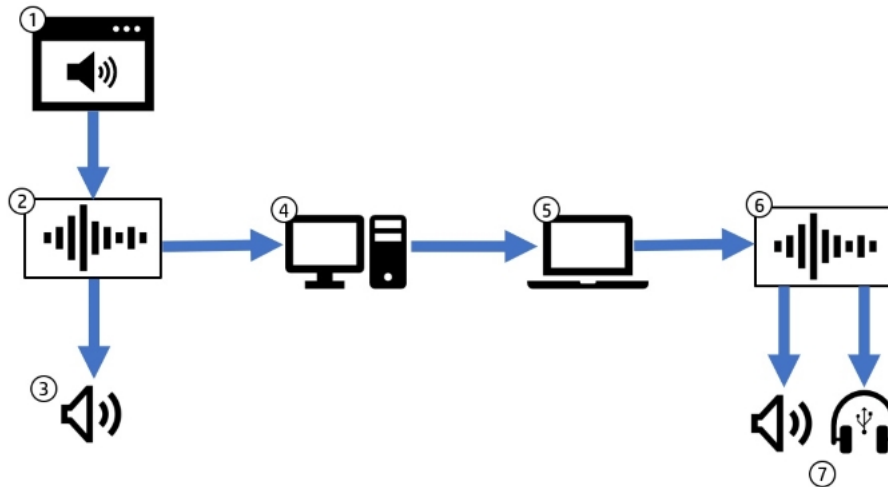


Table 7-3 HP ZCentral Remote Boost audio path

Item	Description
1	Application on the sender that is producing audio
2	Built-in audio service on the sender
3	Audio output on the sender
4	HP ZCentral Remote Boost Sender
5	HP ZCentral Remote Boost Receiver
6	Built-in audio service on the receiver
7	Default audio output device on the receiver

An application on the sender system sends an audio signal using an API that communicates with the system's built-in audio service. This signal is sent to the speakers on the sender system and is also captured by the HP ZCentral Remote Boost Sender using a loopback feature of the audio service. The audio signal is transmitted to the receiver system and played to the default output device.

The audio device on the receiver can be a USB device. However, the device must remain local to the receiver for this path to function. You can disable Remote USB or configure the USB audio device to remain local. See [Configuring the remoting behavior of individual USB devices \(Windows only\) on page 69](#) for details on configuring the device.

NOTE: This path supports only audio output. Audio input using a microphone is not supported with this path.

For information about the audio settings in HP ZCentral Remote Boost Receiver, see [Audio on page 25](#).

For Remote Audio troubleshooting tips, see [Remote Audio issues on page 109](#).

Using Remote Audio (Windows-based sender)

On Windows, Remote Audio works by default.

If the sender has an audio device, the HP ZCentral Remote Boost Sender installation process detects it. If the sender does not have an audio device (or if you disable all audio devices before installing HP ZCentral Remote Boost Sender), then the HP Remote Audio virtual audio device is also installed during the HP ZCentral Remote Boost Sender installation process to meet the requirement that an audio device must be present to allow applications to communicate with the audio service. Unlike the Linux virtual audio device, the Windows virtual audio device does not alter the path of the audio data. The sender still captures the audio data using the loopback feature of the audio service.

Using Remote Audio (Linux-based sender)

On Linux, applications typically use either the PulseAudio or ALSA API to communicate with the audio device. If the default device is used, the PulseAudio and ALSA APIs have the audio signal routed through the PulseAudio audio service where the HP ZCentral Remote Boost Sender can capture the signal using a built-in loopback feature PulseAudio.

PulseAudio

The HP ZCentral Remote Boost Sender uses the PulseAudio's built-in loopback feature to capture the audio output signal. This feature is configured by default and does not require any manual configuration.

ALSA

Some applications bypass PulseAudio using ALSA's ability to communicate directly with the audio device. The default HP ZCentral Remote Boost Sender configuration does not capture audio from these applications.

The following diagram illustrates the audio path used by these applications.

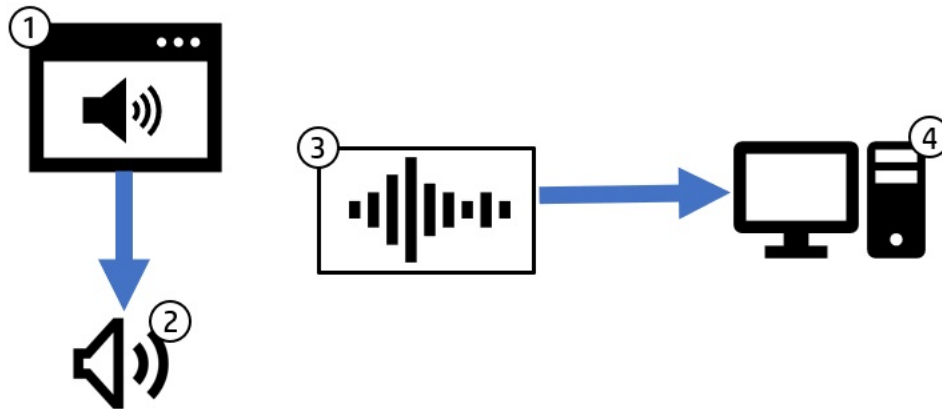


Table 7-4 ALSA audio path

Item	Description
1	Application on the sender that is producing audio
2	Audio output on sender system
3	Audio Service (PulseAudio)
4	HP ZCentral Remote Boost Sender

The application bypasses PulseAudio and communicates directly with the audio device. Audio is captured on the sender system. However, the audio data is not sent through PulseAudio. As a result, no audio data is transmitted to the receiver without manual configuration.

The HP ZCentral Remote Boost Sender provides a utility to configure the system with a virtual audio device. This virtual audio device has a loopback feature that allows the sender to capture the audio signal for playback on the receiver. Output sent to the virtual audio device will not be sent to the speakers on the sender system. The following diagram illustrates the audio path used when the sender is configured to capture audio through the virtual audio device.

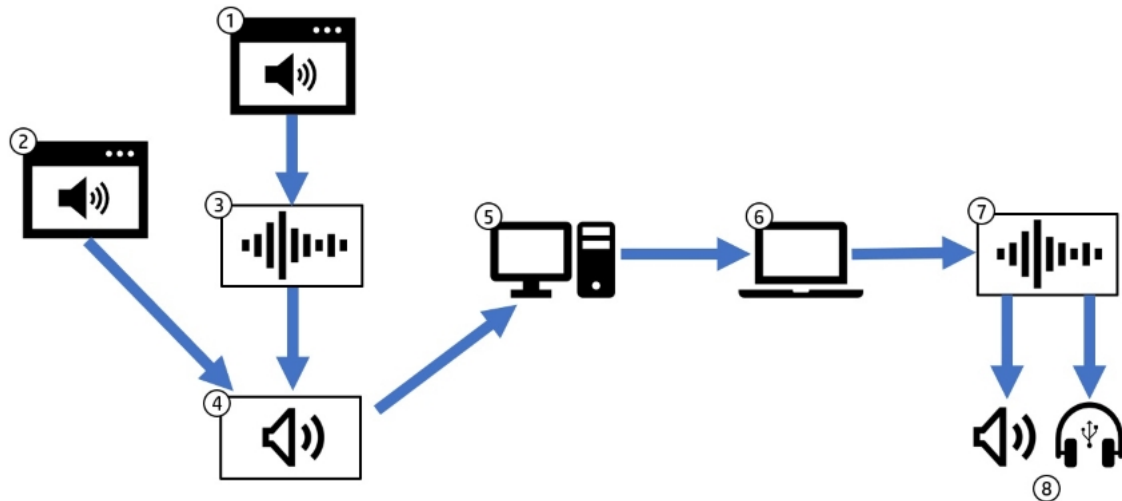


Table 7-5 ALSA path with virtual audio device

1	App 1 on the sender that is producing audio
2	App 2 on the sender that is producing audio
3	Built-in audio service on the sender (PulseAudio)
4	Virtual audio device on the sender
5	HP ZCentral Remote Boost Sender
6	HP ZCentral Remote Boost Receiver
7	Built-in audio service on the receiver
8	Default audio output device on the receiver

In the previous diagram, App1 sends audio through PulseAudio and App2 bypasses PulseAudio to communicate directly with the virtual audio device. The sender can capture audio from either source by using the loopback feature of the virtual audio device. The virtual audio device currently does not mix multiple input audio streams into a single output stream. As a result, the sender captures audio from only one application at a time.

The utility to configure the system to use a virtual audio driver is called `rg_alsa_config.sh` and is located in `/opt/hpremove/rgsender/audio`. To view available options, run the following command in a terminal:

```
/opt/hpremove/rgsender/audio/rg_alsa_config.sh help
```

To configure the system to install the virtual audio driver and use the device in the sender, run the following command in a terminal as administrator:

```
/opt/hpremove/rgsender/audio/rg_alsa_config.sh alsa
```

Another limitation of the virtual audio driver is that the input rate must match the output rate. By default, the sender will attempt to capture at the default system rate of 44K samples per second. In some cases, it may be necessary to configure the sender to capture at 48K samples per second. The following command can be run in a terminal as administrator to set the sender capture rate to 48K. This does not change the sample rate sent between the receiver and sender.

```
/opt/hpremove/rgsender/audio/rg_alsa_config.sh alsa 48
```

To restore the sender to the default configuration and capture audio from the PulseAudio service, run the following command in a terminal as administrator:

```
/opt/hpremove/rgsender/audio/rg_alsa_config.sh reset
```

When the `rg_alsa_config.sh` script is run to change the configuration, a reboot is necessary to have the changes take effect.

Remote Microphone (Linux senders only)

Remote Microphone allows audio generated by a microphone that is connected to the receiver to stream into a virtual microphone on the sender.

HP ZCentral Remote Boost mic path

The receiver application begins capturing an audio signal from the default microphone when it connects to the sender. This signal injects into a virtual device on the sender system. Applications on the sender system can choose to record from this virtual device like any other microphone device attached to the system.

The microphone on the receiver can be a USB device or an analog audio device. However, a USB device must remain local for it to function. You can disable Remote USB or configure the USB audio device to remain local. See [Configuring the remoting behavior of individual USB devices \(Windows only\) on page 69](#) for details on configuring the device.



NOTE: You must enable the remote microphone feature prior to establishing a connection with the sender.

Using Remote Microphone

The receiver captures microphone input from the default audio input device when a connection is made. Changing the default input device during a connection is not supported and can result in unexpected behavior. You can change the default input device in several ways.

On Windows, open **Settings > System > Sound > Sound Control Panel**, select the **Recording** tab, select your preferred device, and select **Set Default**.

On Mac, open **System Preferences > Sound**, select the **Input** tab, and select your preferred device.

On Linux, open **Settings > Sound**, select the **Input** tab, and select your preferred device.

The receiver continues to capture audio for the length of the connection, regardless of whether an application expects audio input on the sender.

PulseAudio

The virtual microphone device on the sender works through the Linux audio library PulseAudio. If the application that you use does not support PulseAudio, then the Remote Microphone feature will not function.

Remote Clipboard

Remote Clipboard allows you to cut, copy, and paste data between the receiver and the sender or between two different senders.

Copying, cutting, and pasting text is supported on Windows, Linux, and macOS. Copying, cutting, and pasting an image is only supported between a Windows-based sender and Windows-based receiver. In addition, copying, cutting, and pasting images is only supported for individual images. You cannot copy, cut, or paste groups of images or image and text combinations.

On Windows, Remote Clipboard must be enabled during both the HP ZCentral Remote Boost Sender and HP ZCentral Remote Boost Receiver installations (see [Installation on page 7](#)).

On Linux, Remote Clipboard is installed by default.

On Windows, Linux, and macOS, Remote Clipboard must also be enabled in HP ZCentral Remote Boost Receiver (see [Connection on page 23](#)).



TIP: Setting the logging level of HP ZCentral Remote Boost Receiver or HP ZCentral Remote Boost Sender to `DEBUG` enables Remote Clipboard log information.

Remote USB (Windows and ThinPro only)

Remote USB allows USB devices physically attached to the receiver to be virtually attached (mounted) to the sender. This gives the sender direct access to the USB devices, as if the devices were physically attached to it.

See the following list for information about Remote USB support:

- The sender must be Windows-based.
- The receiver can be either Windows-based or ThinPro-based.
- A receiver's physically attached USB devices can be collectively attached to a single sender. The devices cannot be split between multiple senders, nor can they be collectively attached to multiple senders.
- HP ZCentral Remote Boost supports all four USB data transfer types (bulk, isochronous, interrupt, and control).
- USB devices that adhere to the USB 1.x, 2.x, or 3.x standard should work. However, devices that are sensitive to timing might experience decreased performance, or they might not function at all. HP recommends thoroughly testing any USB device intended for use with HP ZCentral Remote Boost.
- File copies might take longer due to the additional overhead of the network protocol on top of the USB protocol.

Configuring the remoting behavior of individual USB devices (Windows only)

The remoting behavior for individual USB devices can be altered from what was set globally during installation.



IMPORTANT: This configuration requires modifications to the Windows registry on the receiver. Registry modifications should be made with extreme caution, and you should always make a backup of the registry prior to making any changes.

To configure the remoting behavior of a USB device:

1. Find the vendor ID and device ID for the USB device (see [Determining USB device information \(Windows\) on page 72](#)).
2. Open the Registry Editor and create the following registry key:

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\hprpushb\Parameters\Device
```

3. Create the following registry key:

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\hprpushb\Parameters\Device\VID_VendorID&PID_ProductID
```

4. For the key you just created, create a string value named `Mode`.
5. Set the value of `Mode` to `auto`, `local`, or `remote`.



NOTE: If set to `auto`, the USB device switches its mounted location between the sender and the receiver at the start and end of an HP ZCentral Remote Boost connection respectively. If set to `remote`, you must physically disconnect the USB device from the receiver after the HP ZCentral Remote Boost session ends and then reconnect the USB device for it to be usable on the receiver.

USB audio

A USB driver will submit a request to either read or write data and may not submit an additional request until a response is received from a previous request. USB audio drivers often submit multiple requests in an attempt to buffer a small amount of data to ensure a continuous stream of data.

The amount of data buffered might not be sufficient to compensate for network latency and jitter, which can result in audio discontinuities. Results using a USB audio device with Remote USB will depend on the device, the driver, and the quality of the network connection.

When using a USB audio device as a speaker only, consider keeping the device local to the receiver by either disabling Remote USB or by configuring the behavior of the device (see [Configuring the remoting behavior of individual USB devices \(Windows only\) on page 69](#)). Remote Boost can then use the Remote Audio path to send audio to the USB speaker. Remote Audio doesn't require a round trip to keep the audio data continuous and can handle network latency.

When microphone access is required, Remote USB is currently the only option. If the receiver was installed with the default Remote USB configuration or the configurations set to USB devices are Local/Remote (see [Installing HP ZCentral Remote Boost Receiver \(Windows\) on page 7](#)), then the USB audio device needs to be plugged in after a connection is established. Alternatively, the device can be configured to automatically remote (see [Configuring the remoting behavior of individual USB devices \(Windows only\) on page 69](#)).

The audio path when using Remote USB is illustrated in the following diagram:

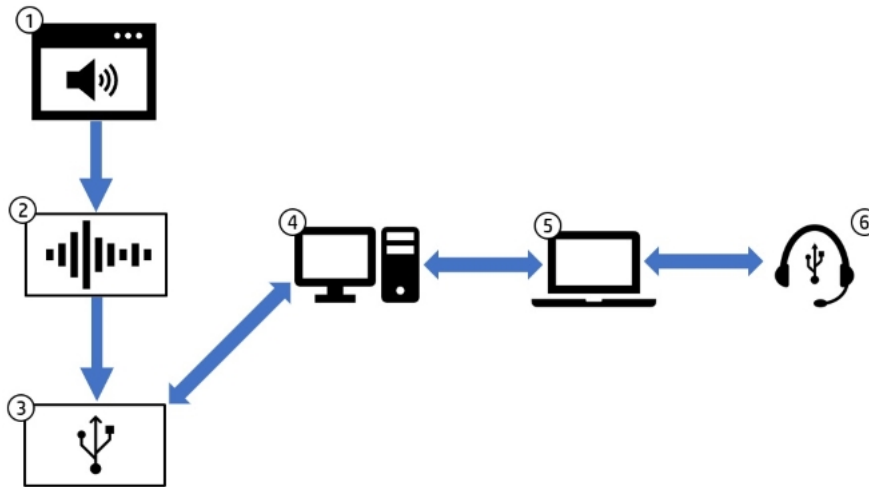


Table 7-6 USB audio path

Item	Description
1	Application on the sender that is producing audio
2	Built-in audio service on the sender
3	USB driver
4	HP ZCentral Remote Boost Sender
5	HP ZCentral Remote Boost Receiver
6	Audio input/output device on the receiver

The receiver captures the USB audio device and remotes it to the sender. The device is not available for other applications to use on the receiver system. A driver on the sender controls the remote device. To an application on the sender system, the remote audio device appears connected directly to the sender system. USB requests to play or record audio are sent over the network to the device. The receiver sends a response to these requests back to the sender, where they are transferred to the USB driver.


Remote USB Access Control List

HP ZCentral Remote Boost Sender supports an Access Control List (ACL) file that contains rules that specify whether to allow a Remote USB connection from a USB device on the receiver side.

Each rule in the ACL file has a type of `allow` or `deny`. The rules are evaluated for each Remote USB connection request as described:

- If any rule indicates the USB connection should be denied, the connection is denied, regardless of any other rule.
- If any rule indicates the USB connection should be allowed, and if there are no rules that deny the connection, the connection is allowed.
- If no rules match at all, the connection is denied.

The ACL file is implemented in XML format and is accompanied by an XSD (XML Schema Definition) file that defines the XML elements. The default ACL file `hprDefaultUsbAcl.xml` and the XSD file `hprUsbAcl.xsd` are both in the HP ZCentral Remote Boost Sender installation directory.

 **TIP:** You can specify different files using the HP ZCentral Remote Boost Sender Configuration tool (see [HP ZCentral Remote Boost Sender Configuration tool \(Windows/Linux only\)](#) on page 86).

The default ACL file contains the following contents, which allows all USB connections to be made:

```
<hprUsbAcl> <ruleset> <rule type="allow"> <name>Allow all USB devices (HP default)</name> </rule> </ruleset></hprUsbAcl>
```

Rules can contain the filters described in the following table.


 **TIP:** See `hprUsbAcl.xsd` for examples of using filters.

Table 7-7 Filter commands and their descriptions

Filter	Description
<code>bDeviceClass</code>	The device class
<code>bDeviceSubclass</code>	The device subclass
<code>bDeviceProtocol</code>	The device protocol
<code>idVendor</code>	The vendor ID
<code>idProduct</code>	The product ID
<code>bcdDevice</code>	The device version number
<code>manufacturer</code>	The manufacturer name
<code>product</code>	The product name
<code>serialNumber</code>	The product serial number
<code>peerAddress</code>	The IP address of the receiver
<code>group</code>	The domain group of the user logged on to the receiver

IMPORTANT: Filtering by `manufacturer`, `product`, or `serialNumber` is not reliable because the manufacturer is not required to fill in those values.

Determining USB device information (Windows)

To determine USB device information:

1. Open Device Manager and find the USB device under **Universal Serial Bus controllers**.
2. Double-click the USB device, and then select the **Details** tab in the window that appears.
3. Determine the vendor ID, product ID, class, subclass, and protocol.
 - a. Select **Hardware Ids** from the drop-down menu. The vendor ID and product ID are displayed in the following format:

```
USB\VID_<vendor ID>&PID_<product ID>
```

In the following example, the vendor ID is 1234 and the device ID is 5678:

```
USB\VID_1234&PID_5678
```

- b. Select **Compatible Ids** from the drop-down menu. The class, subclass, and protocol are represented by numerical codes and are displayed in the following format:

```
USB\Class_<class code>&SubClass_<subclass code>&Prot_<protocol code>
```

In the following example, the class code is 08, the subclass code is 06, and the protocol code is 50:

```
USB\Class_08&SubClass_06&Prot_50
```

Determining USB device information (Linux)

To see the list of devices on the system, run the following command in a terminal.

```
lsusb
```

To get additional details about a device, use the bus ID and device ID reported by running `lsusb` and run a command with the following format in a terminal:

```
lsusb -s <bus-id>:<device-id> -v
```

For example, if `lsusb` reported a bus ID of 2 and a device ID of 3 for a device of interest, the following command would show additional device information:


```
lsusb -s 2:3 -v
```

Enabling Remote USB on HP ThinPro

Remote USB can be enabled for HP ZCentral Remote Boost Receiver on HP ThinPro if the sender is Windows-based.

To enable Remote USB on HP ThinPro:

1. In HP ThinPro, open the USB Manager and set the USB protocol to **HP ZCentral Remote Boost**.
2. Restart the thin client.
3. Ensure that **Enable remote USB** is enabled in HP ZCentral Remote Boost Receiver.

 **NOTE:** The settings in USB Manager on ThinPro to allow specific devices or classes to be redirected do not apply to Remote Boost.

Directory Mode

Directory Mode lets you connect to multiple senders simultaneously from a single receiver. When you start HP ZCentral Remote Boost Receiver in Directory Mode, it looks for a directory file containing user names and computer names. HP ZCentral Remote Boost Receiver reads this file and attempts to connect to each specified sender automatically.

The default directory file is `directory.txt` in the HP ZCentral Remote Boost Receiver installation directory.

 **NOTE:** This file contains examples that are commented out using the number sign (#) character.

Directory file format

The directory file is often a common file for a group, department, organization, or an entire company. The directory file can manage and administer the senders for any number of users. HP recommends that you save the directory file on a readily accessible network file share or mapped drive so it can be shared by multiple receivers.

The directory file is a text file with the following format for each user:

```
<domain name> <user name> <computer name> [<computer name> ...]
```

The domain name of a Windows-based receiver depends on the environment. For a domain account, using the example `worldwide\user1`, the domain name used for Directory Mode would be `worldwide`.

The following example directory file specifies the senders for user1 and user2 in a domain account environment:

```
worldwide user1 RC_1 RC_2 RC_3
```

```
worldwide user2 RC_4 RC_5 RC_6
```

For a local account, using the example `user1_computer\user1`, the domain name used for Directory Mode would be `user1_computer`.

The following example directory file specifies the senders for user1 and user2 in a local account environment:

```
user1_computer user1 RC_1 RC_2 RC_3
```

```
user2_computer user2 RC_4 RC_5 RC_6
```

For Linux-based receiver, use `UNIX` as the domain name.

The domain name does not apply when using the directory file for Linux users. Instead, use the keyword `UNIX` in place of the domain name. For example:

```
UNIX user1 RC_1 RC_2 RC_3
```

If the user name contains white-space characters, the name can be enclosed in double-quotes as shown:

```
domain1 "user1 user" RC_1 RC_2 RC_3
```

```
domain1 "user2 user" RC_4 RC_5 RC_6
```

Starting HP ZCentral Remote Boost Receiver in Directory Mode (Windows)

You can verify the HP ZCentral Remote Boost Receiver connection and then start Directory Mode.

Verifying the HP ZCentral Remote Boost connection

Before you attempt a connection in Directory Mode for the first time, HP recommends that you first verify that HP ZCentral Remote Boost can connect to each computer individually.

- ▲ **Windows 10:** Select **Start**, type `HP ZCentral Remote Boost`, and then select **HP ZCentral Remote Boost Receiver Directory Mode** from the search results.

Bringing a specific HP ZCentral Remote Boost Receiver window to the front

To bring a specific HP ZCentral Remote Boost Receiver window to the front:

1. Enable Setup Mode using the hotkey sequence (see [Setup Mode on page 22](#)).
2. Press **Tab** to open the HP ZCentral Remote Boost Receiver window selector, and then select an HP ZCentral Remote Boost Receiver window.

Starting HP ZCentral Remote Boost Receiver in Directory Mode (macOS)

To start Directory Mode:

- ▲ Run either of the following commands on the command line:

```
open -a "HP RGS Receiver" --args -directory Filename
```

```
open -a "HP RGS Receiver" --args -directory
```

If a file name is specified after `-directory`, HP ZCentral Remote Boost Receiver uses that file as the directory file. If no file name is specified, you are prompted to specify the path and name of the directory file.

8 Configuration tools and properties

On Windows and Linux, HP ZCentral Remote Boost Receiver and HP ZCentral Remote Boost Sender each include a configuration tool that allows you to modify some of the more advanced HP ZCentral Remote Boost settings. Most of the options in the configuration tools correspond to one of the properties in the `rgreceiverconfig` and `rgsenderconfig` files respectively.

On macOS, properties must be set manually by editing the file `/Library/Application Support/HP/rgreceiverconfig`.

This chapter discusses the following topics:



NOTE: When settings are changed using the configuration tools, the process described in [Setting property values in a configuration file on page 94](#) is automated. Manual editing of the configuration files is not necessary unless you want to add or modify properties that do not have a corresponding option in one of the configuration tools, such as the per-session properties of HP ZCentral Remote Boost Receiver.

See [Setting HP ZCentral Remote Boost properties manually on page 93](#) and [Other properties on page 95](#) for more information.

HP ZCentral Remote Boost Receiver setting override hierarchy

In the following hierarchy, settings configured using methods higher on the list override settings configured using methods lower on the list (with 1 being the highest and 5 being the lowest).

Options changed during the lifetime of the receiver, via the UI of the receiver, will override any value previously set using HP ZCentral Remote Boost Receiver Configuration tool (or by manually editing the properties in the `rgreceiverconfig` file). If an administrator wants to prevent previously saved values from taking effect, they must mark the property as `immutable` (see below).

1. Settings configured in HP ZCentral Remote Boost Receiver
2. Settings configured on the command line
3. Settings that were persisted the last time HP ZCentral Remote Boost Receiver was closed.
4. Settings configured using the HP ZCentral Remote Boost Receiver Configuration tool (or by manually editing the properties in the `rgreceiverconfig` file)
5. Default settings

HP ZCentral Remote Boost Receiver Configuration tool (Windows and Linux Only)

The HP ZCentral Remote Boost Receiver includes the HP ZCentral Remote Boost Receiver Configuration tool.

Using the HP ZCentral Remote Boost Receiver Configuration tool

These instructions describe how to use the HP ZCentral Remote Boost Receiver Configuration tool.

1. Start the tool:

- On Windows, navigate to the HP ZCentral Remote Boost Receiver installation directory and run the following executable:

```
receiverConfigApp.exe
```


- On Linux, select the **Applications** or **Activities** menu, and then either select **HP ZCentral Remote Boost Receiver Configuration** or open a command line and execute the following command:

```
/usr/bin/rgreceiverconfig
```

2. Configure the options the options that you want.



NOTE: See the tables in the following sections for descriptions of each of the options.

3.  **TIP:** To restore all default HP ZCentral Remote Boost Receiver Configuration settings, be sure that HP ZCentral Remote Boost Receiver is not running, and then select **Restore to default** in the lower-left corner of the HP ZCentral Remote Boost Receiver Configuration tool. Alternatively, uninstalling and then reinstalling HP ZCentral Remote Boost Receiver restores all default settings.

Select **Save** to save your changes.

General

The following table describes the options available in the **General** panel of the HP ZCentral Remote Boost Receiver Configuration tool. The corresponding property in the `rgreceiverconfig` file is noted for reference.

Table 8-1 General options and their descriptions

Option	Description
Snap the Receiver window when close to the edge of the screen	When enabled, the HP ZCentral Remote Boost Receiver window will snap when close to the top or left edge of the screen. Configuration file property (Windows/Linux only): <code>Rgreceiver.IsSnapEnabled</code>
Enable the Receiver window Toolbar	Enables the HP ZCentral Remote Boost Receiver toolbar. Configuration file property (Windows/Linux only): <code>Rgreceiver.IsMenubarEnabled</code>
Display a warning that disconnecting from HP ZCentral Remote Boost while logged in will not log the user out of the remote system	When enabled, HP ZCentral Remote Boost Receiver will display a warning that disconnecting an HP ZCentral Remote Boost connection will not automatically log them out of the sender. Configuration file property (Windows/Linux/macOS): <code>Rgreceiver.IsDisconnectWarningEnabled</code>
Network disruption warning color	Use the Color and Transparency controls to set the color that overlays the HP ZCentral Remote Boost Receiver window when HP ZCentral Remote Boost Receiver detects a network disruption. Configuration file property (Windows/Linux/macOS):

Table 8-1 General options and their descriptions (continued)

Option	Description
	<code>Rgreceiver.ConnectionWarningColor</code>
Enable HP ZCentral Remote Boost to communicate mouse cursor snaps	When enabled, mouse cursor snaps (such as to the default button of a dialog box) will be communicated by HP ZCentral Remote Boost.
	Configuration file property (Windows/Linux/macOS):
	<code>Rgreceiver.IsMouseSyncEnabled</code>
Number of recent remote connections listed	Sets the number of recent remote connections to list in HP ZCentral Remote Boost Receiver.
	Configuration file property (Windows/Linux/macOS):
	<code>Rgreceiver.MaxSenderListSize</code>
File used for Directory Mode	Specifies the file to use for Directory Mode.
	Configuration file property (Windows/Linux/macOS):
	<code>Rgreceiver.Directory</code>
Always prompt for the domain, user name, and password when establishing a connection	When enabled, HP ZCentral Remote Boost Receiver will always prompt for the domain, user name, and password when establishing a connection.
	Configuration file property (Windows/Linux only):
	<code>Rgreceiver.IsAlwaysPromptCredentialsEnabled</code>
Certificate Verification Failure Policy	Specifies what HP ZCentral Remote Boost Receiver does if the verification of the sender certificate fails. Select Accept , Prompt to accept , or Deny .
	Configuration file property (Windows/Linux/macOS):
	<code>Rgreceiver.Network.Certificate.VerificationPolicy={Accept Prompt to accept Deny}</code>
Allow user to modify Certificate Verification Failure Policy	Enables the user to change the Certificate Verification Failure Policy setting.
	Configuration file property (Windows/Linux/macOS):
	<code>Rgreceiver.Network.Certificate.VerificationPolicy.IsMutable={0 1}</code>
Allow user to set whether the Remote Clipboard is enabled	When enabled, a user can modify the Enable remote clipboard setting in HP ZCentral Remote Boost Receiver .
	Configuration file property (Windows/Linux/macOS):
	<code>Rgreceiver.Clipboard.IsMutable</code>
Enable Remote Clipboard by default	Enables Remote Clipboard by default.
	Configuration file property (Windows/Linux/macOS):
	<code>Rgreceiver.Clipboard.IsEnabled</code>

Table 8-1 General options and their descriptions (continued)

Option	Description
Remote Clipboard filters	<p>IMPORTANT: This property is for advanced users only. It should only be changed from its default value if Remote Clipboard does not support the clipboard format required by your application.</p> <p>The Selected filters window specifies the clipboard formats that are allowed to be transferred using Remote Clipboard. By default, all filters are selected, but filters can be removed by moving them to the Available filters window.</p> <p>NOTE: For more information about clipboard formats, go to http://msdn2.microsoft.com/en-us/library/ms649013.aspx.</p> <p>Configuration file property (Windows only):</p> <p><code>Rgreceiver.Clipboard.FilterString</code></p>

Image and Display

The following table describes the options available in the **Image and Display** panel of the HP ZCentral Remote Boost Receiver Configuration tool. The corresponding property in the `rgreceiverconfig` file is noted for reference.

Table 8-2 Image and Display options and their descriptions

Option	Description
Enable Advanced Video Compression on Sender	<p>Enables Advanced Video Compression by default.</p> <p>Configuration file property (Windows/Linux only):</p> <p><code>Rgreceiver.ImageCodec.IsH264Enabled</code></p>
Advanced Video Compression encoding	<p>Sets whether Advanced Video Compression encoding should be handled by the sender's GPU or CPU.</p> <p>Configuration file property (Windows/Linux only):</p> <p><code>Rgreceiver.ImageCodec.UseGPU</code></p>
Maximum number of cores	<p>Sets the maximum number of CPU cores on the receiver that can be used for decoding.</p> <p>NOTE: This option is not available if Advanced Video Compression is enabled.</p> <p>Configuration file property (Windows/Linux/macOS):</p> <p><code>Rgreceiver.Decoder.ThreadPoolSize</code></p>
Increase text rendering quality	<p>Improves image quality for images containing significant amounts of text or lines.</p> <p>Configuration file property (Windows/Linux/macOS):</p> <p><code>Rgreceiver.ImageCodec.IsBoostEnabled</code></p>
Enable image quality slider	<p>When enabled, the image quality slider can be adjusted by a user, either in HP ZCentral Remote Boost Receiver or on the HP ZCentral Remote Boost Receiver toolbar.</p>

Table 8-2 Image and Display options and their descriptions (continued)

Option	Description
	Configuration file property (Windows/Linux/macOS): <code>Rgreceiver.ImageCodec.IsMutable</code>
Image Quality by default	Sets the default image quality (from 0 to 100). Configuration file property (Windows/Linux/macOS): <code>Rgreceiver.ImageCodec.Quality</code>
Enable adaptive image quality by default	When enabled, HP ZCentral Remote Boost will use the Adaptive image quality settings by default. Configuration file property (Windows/Linux/macOS): <code>Rgreceiver.Experience.Mode</code>
Minimum image quality	Sets the default value for the Minimum image quality setting. Configuration file property (Windows/Linux/macOS): <code>Rgreceiver.Experience.MinImageQuality</code>
Target update rate	Sets the default value for the Target update rate setting. Configuration file property (Windows/Linux/macOS): <code>Rgreceiver.Experience.MinUpdateRate</code>
Max number of image update requests	This property provides performance optimization in high-latency network environments by setting the maximum number of image updates HP ZCentral Remote Boost Sender can send across the network without hearing back from HP ZCentral Remote Boost Receiver. Increasing this value might help increase the frame rate at the expense of increased network bandwidth consumption. Configuration file property (Windows/Linux/macOS): <code>Rgreceiver.MaxImageUpdateRequests</code>
Force full screen image updates	Enables the Force full screen image updates option in HP ZCentral Remote Boost Receiver by default. Configuration file property (Windows/Linux only): <code>Rgreceiver.IsGlobalImageUpdateEnabled</code>
Set Sender display(s) to match Receiver display(s) by default	Enables the Set Sender display(s) to match Receiver display(s) option in HP ZCentral Remote Boost Receiver by default. Configuration file property (Windows/Linux/macOS): <code>Rgreceiver.IsMatchReceiverResolutionEnabled</code> NOTE: This property is mutually exclusive with <code>Rgreceiver.UseDisplayProperties</code> .
Set Sender display(s) to match display properties by default	Enables the Set Sender display(s) to match display properties option in HP ZCentral Remote Boost Receiver by default. Configuration file property (Windows/Linux/macOS):

Table 8-2 Image and Display options and their descriptions (continued)

Option	Description
	<code>Rgreceiver.UseDisplayProperties</code>
	NOTE: This property is mutually exclusive with <code>Rgreceiver.IsMatchReceiverResolutionEnabled</code> .

Audio

The following table describes the options available in the **Audio** panel of the HP ZCentral Remote Boost Receiver Configuration tool. The corresponding property in the `rgreceiverconfig` file is noted for reference.

Table 8-3 Audio options and their descriptions

Option	Description
Allow user to modify audio settings	When enabled, a user can modify the audio settings in HP ZCentral Remote Boost Receiver . Configuration file property (Windows/Linux/macOS): <code>Rgreceiver.Audio.IsMutable</code>
Enable Remote Audio by default	Enables Remote Audio by default. Configuration file property (Windows/Linux/macOS): <code>Rgreceiver.Audio.IsEnabled</code>
Enable stereo audio by default	Enables stereo audio by default. Configuration file property (Windows/Linux/macOS): <code>Rgreceiver.Audio.IsInStereo</code>
Audio quality	Sets the default audio quality. Configuration file property (Windows/Linux/macOS): <code>Rgreceiver.Audio.Quality</code>
Only play audio from current Receiver window	When enabled, audio will play only from the HP ZCentral Remote Boost Receiver window that has focus. When disabled, audio from all HP ZCentral Remote Boost Receiver windows will be combined. Configuration file property (Windows/Linux/macOS): <code>Rgreceiver.Audio.IsFollowsFocusEnabled</code>

Network (Receiver)

The following table describes the options available in the **Network** panel of the HP ZCentral Remote Boost Receiver Configuration tool. The corresponding property in the `rgreceiverconfig` file is noted for reference.



IMPORTANT: When setting Network properties manually via the command line or the `rgreiverconfig` file, time value is set in milliseconds. See [Setting HP ZCentral Remote Boost properties manually on page 93](#) for more information

Table 8-4 Network options and their descriptions

Option	Description
Allow user to modify network timeout settings	<p>When enabled, a user can modify the network settings in HP ZCentral Remote Boost Receiver .</p> <p>Configuration file property (Windows/Linux/macOS):</p> <pre>Rgreceiver.Network.Timeout.IsMutable</pre>
Enable the warning dialog for when the HP ZCentral Remote Boost connection is about to time out	<p>Enables the warning dialog for when the HP ZCentral Remote Boost connection is about to time out due to the inability to contact HP ZCentral Remote Boost Sender.</p> <p>Configuration file property (Windows/Linux/macOS):</p> <pre>Rgreceiver.Network.Timeout.IsGuiEnabled</pre>
Error timeout (seconds)	<p>Sets the time in seconds that HP ZCentral Remote Boost Receiver will wait before ending the connection after failing to detect HP ZCentral Remote Boost Sender.</p> <p>Configuration file property (Windows/Linux/macOS):</p> <pre>Rgreceiver.Network.Timeout.Error</pre>
Warning timeout (seconds)	<p>Sets the time in seconds that HP ZCentral Remote Boost Receiver will wait before displaying a warning dialog to the local user after failing to detect HP ZCentral Remote Boost Sender.</p> <p>Configuration file property (Windows/Linux/macOS):</p> <pre>Rgreceiver.Network.Timeout.Warning</pre>
Dialog timeout (seconds)	<p>Sets the time in seconds that HP ZCentral Remote Boost Receiver will wait for a response to a dialog being displayed on the sender (such as an authentication dialog).</p> <p>NOTE: The request will be canceled if there is no response.</p> <p>Configuration file property (Windows/Linux/macOS):</p> <pre>Rgreceiver.Network.Timeout.Dialog</pre>
HP ZCentral Remote Boost Sender network port	<p>Specifies the port to use for communication between HP ZCentral Remote Boost Receiver and HP ZCentral Remote Boost Sender.</p> <p>IMPORTANT: This setting must match the port setting on HP ZCentral Remote Boost Sender.</p> <p>Configuration file property (Windows/Linux/macOS):</p> <pre>Rgreceiver.Network.Port</pre>

HP Velocity

The following table describes the option available in the **HP Velocity** panel of the HP ZCentral Remote Boost Receiver Configuration tool. The corresponding property in the `rgreiverconfig` file is noted for reference.

Table 8-5 HP Velocity option and its description

Option	Description
Enable HP Velocity	Enables HP Velocity. Configuration file property: <code>Rgreceiver.Network.HPVelocity.Enabled</code>

USB (Windows / ThinPro only)

The following table describes the options available in the **USB** panel of the HP ZCentral Remote Boost Receiver Configuration tool. The corresponding property in the `rgreiverconfig` file is noted for reference.

Table 8-6 USB options and their descriptions

Option	Description
Allow user to modify Remote USB settings	When enabled, a user can modify the Remote USB settings in HP ZCentral Remote Boost Receiver . Configuration file property: <code>Rgreceiver.Usb.IsMutable</code>
Enable Remote USB by default	Enables Remote USB by default. Configuration file property: <code>Rgreceiver.Usb.IsEnabled</code>
USB active session	Specifies which sender to attach USB devices to for Directory Mode. Configuration file property: <code>Rgreceiver.Usb.ActiveSession</code>

Hotkeys

The following table describes the options available in the **Hotkeys** panel of the HP ZCentral Remote Boost Receiver Configuration tool. The corresponding property in the `rgreiverconfig` file is noted for reference.

Table 8-7 Hotkeys options and their descriptions

Option	Description
Allow user to modify hotkey settings	When enabled, a user can modify the hotkey settings in HP ZCentral Remote Boost Receiver .

Table 8-7 Hotkeys options and their descriptions (continued)

Option	Description
	Configuration file property (Windows/Linux/macOS): <code>Rgreceiver.Hotkeys.IsMutable</code>
Enable the Send Ctrl+Alt+End key sequence as Ctrl+Alt+Del option by default	Enables the Send CTRL-ALT-END key sequence as CTRL-ALT-DEL option in HP ZCentral Remote Boost Receiver by default. Configuration file property (Windows/Linux/macOS): <code>Rgreceiver.Hotkeys.IsSendCtrlAltEndAsCtrlAltDeleteEnabled</code>
Process a Ctrl+Alt+Delete sequence on both the local and remote computers	When enabled, both the receiver and the sender will process a Ctrl+Alt+Delete sequence. When disabled, only the receiver will process a Ctrl+Alt+Delete sequence. Configuration file property (Windows only): <code>Rgreceiver.Hotkeys.IsCtrlAltDeletePassThroughEnabled</code>
Enable the Setup Mode hotkey sequence	Enables the Setup Mode hotkey sequence. Configuration file property (Windows/Linux/macOS): <code>Rgreceiver.Hotkeys.IsSetupModeEnabled</code>
Setup Mode sequence	Specifies the Setup Mode hotkey sequence. Configuration file property (Windows/Linux/macOS): <code>Rgreceiver.Hotkeys.SetupModeSequence</code>
Enable the Send First Key option by default	Enables the Send First Key option in HP ZCentral Remote Boost Receiver by default. Configuration file property (Windows/Linux/macOS): <code>Rgreceiver.Hotkeys.IsSendFirstKeyInSequenceEnabled</code>
Enable the Key Repeat option by default	Enables the Key Repeat option in HP ZCentral Remote Boost Receiver by default. Configuration file property (Windows/Linux/macOS): <code>Rgreceiver.Hotkeys.IsKeyRepeatEnabled</code>
Enable Game Mode	Enables Game Mode functionality. To toggle Game Mode, press the G key while the HP ZCentral Remote Boost Receiver is in Setup Mode. Configuration file property: <code>Rgreceiver.Hotkeys.IsGameModeEnabled</code>

Logging

The following table describes the options available in the **Logging** panel of the HP ZCentral Remote Boost Receiver Configuration tool. The corresponding property in the `rgreceiverconfig` file is noted for reference.

Table 8-8 Logging options and their descriptions

Option	Description
Allow user to modify logging settings	When enabled, a user can modify the logging settings in HP ZCentral Remote Boost Receiver. Configuration file property (Windows/Linux/macOS): <code>Rgreceiver.Log.IsMutable</code>
Enable HP ZCentral Remote Boost Receiver logging by default	Enables logging for HP ZCentral Remote Boost Receiver by default. Configuration file property (Windows/Linux/macOS): <code>Rgreceiver.Log.IsFileLoggerEnabled</code>
Log Level	Sets the lowest level of output to log. The specified level and anything more serious will be logged in the HP ZCentral Remote Boost Receiver log file. Configuration file property (Windows/Linux/macOS): <code>Rgreceiver.Log.Level</code>
Log file path	Specifies the path to the HP ZCentral Remote Boost Receiver log file. Configuration file property (Windows/Linux/macOS): <code>Rgreceiver.Log.Filename</code>
Max logfile size (KB)	Sets the maximum size the HP ZCentral Remote Boost Receiver log file can be in kilobytes (KB). Configuration file property (Windows/Linux/macOS): <code>Rgreceiver.Log.MaxFileSize</code>

Activation

The following table describes the options available in the **Activation** panel of the HP ZCentral Remote Boost Receiver Configuration tool. The corresponding property in the `rgreceiverconfig` file is noted for reference.

Table 8-9 Activation options and their descriptions

Option	Description
Use a proxy server when activating HP ZCentral Remote Boost Advanced Features	Enables the use of a proxy server for activation of HP ZCentral Remote Boost Advanced Features. Configuration file property: <code>Rgreceiver.Network.ProxyEnabled</code>
Proxy server address	Specifies the proxy server address to use for activation of HP ZCentral Remote Boost Advanced Features. Configuration file property:

Table 8-9 Activation options and their descriptions (continued)

Option	Description
	<code>Rgreceiver.Network.ProxyAddress</code>
Proxy port	Specifies the proxy server port to use for activation of HP ZCentral Remote Boost Advanced Features. Configuration file property: <code>Rgreceiver.Network.ProxyPort</code>

HP ZCentral Remote Boost Sender setting override hierarchy

To override default settings in HP ZCentral Remote Boost Sender:

- ▲ Use the HP ZCentral Remote Boost Sender Configuration tool or manually edit the properties in the `rgsenderconfig` file.

HP ZCentral Remote Boost Sender Configuration tool (Windows/Linux only)

HP ZCentral Remote Boost Sender includes the HP ZCentral Remote Boost Sender Configuration tool.

Using the HP ZCentral Remote Boost Sender Configuration tool

These instructions describe how to use the HP ZCentral Remote Boost Sender Configuration tool.

1. Start the tool:
 - On Windows, navigate to the HP ZCentral Remote Boost Sender installation directory and run the following executable:

```
senderConfigApp.exe
```

- On Linux, select the **Applications** or **Activities** menu, and then either select **HP ZCentral Remote Boost Sender Configuration** or open a command line and execute the following command:

```
/usr/bin/rgsenderconfig
```

2. Configure the options that you want.



NOTE: See the tables in the following sections for descriptions of each of the options.

3. Select **Save** to save your changes.



TIP: To restore all default HP ZCentral Remote Boost Sender Configuration settings, be sure that the HP ZCentral Remote Boost Sender service is stopped, and then select **Restore to default** in the lower-left corner of the HP ZCentral Remote Boost Sender Configuration tool. Alternatively, uninstalling and then reinstalling HP ZCentral Remote Boost Sender restores all default settings.



NOTE: You can also change authentication settings via the command line. When you use the tool with command line arguments, the tool's GUI is not displayed. See [Authentication \(Windows only\) on page 88](#) for details.

General

The following table describes the options available in the **General** panel of the HP ZCentral Remote Boost Sender Configuration tool. The corresponding property in the `rgsenderconfig` file is noted for reference.

Table 8-10 General options and their descriptions


Option	Description
End the HP ZCentral Remote Boost session and disconnect all collaborators when the primary user logs out	<p>When enabled, HP ZCentral Remote Boost Sender ends the HP ZCentral Remote Boost connection and disconnects all collaborators when the primary user logs out.</p> <p>NOTE: On Linux, the HP ZCentral Remote Boost connection always ends when the primary user logs out.</p> <p>Configuration file property (Windows only):</p> <p><code>Rgsender.IsDisconnectOnLogoutEnabled</code></p>
Enable session reconnection after logout or fast user switching.	<p>Enables session reconnection after logout or fast user switching.</p> <p>Configuration file property (Windows only):</p> <p><code>Rgsender.IsReconnectOnConsoleDisconnectEnabled</code></p>
Enable monitor blanking on Sender when a remote user connects	<p>When enabled, the sender's screen will blank and its keyboard and mouse will disable when a remote user connects.</p> <p>Configuration file property (Windows/Linux):</p> <p><code>Rgsender.IsBlankScreenAndBlockInputEnabled</code></p>
Disable Input Blocking	<p>When enabled, this setting allows local keyboard and mouse input on the sender. This overrides the default behavior of <code>IsBlankScreenAndBlockInputEnabled=1</code> by allowing local input to occur while continuing to blank the screen. This setting is specifically designed to allow composite USB devices (for example, 3DConnexion) to function properly when remoted over USB.</p> <p>Configuration file property (Windows/Linux):</p> <p><code>Rgsender.DisableInputBlocking</code></p>
Enable Remote Audio	<p>Enables Remote Audio.</p> <p>Configuration file property (Windows/Linux):</p> <p><code>Rgsender.Audio.IsEnabled</code></p>
Enable Remote Clipboard	<p>Enables Remote Clipboard.</p> <p>Configuration file property (Windows/Linux):</p> <p><code>Rgsender.Clipboard.IsEnabled</code></p>
Allow connections from RGS 7.4 and earlier receivers	<p>When enabled, allows the use of legacy security settings, enabling HP RGS 7.4 and earlier receivers to connect without configuring certificates. Not recommended for highest security.</p>


Table 8-10 General options and their descriptions (continued)

Option	Description
	Configuration file property (Windows/Linux): <code>Rgsender.EnableLegacySecurity</code>

Authentication (Windows only)

The **Authentication** panel of the HP ZCentral Remote Boost Sender Configuration tool can be used to choose between standard authentication, Easy Login, or Single Sign-on.

 **NOTE:** This panel replaces the HP ZCentral Remote Boost Admin tool previously included with HP ZCentral Remote Boost Sender on Windows.

 **TIP:** Authentication settings can also be changed via the command line. The following commands are supported:

Enable Standard Authentication: `senderConfigApp.exe -enableStandardLogin`

Enable Single Sign-on: `senderConfigApp.exe -enableSSO`

Enable Easy Login: `senderConfigApp.exe -enableEasyLogin`

Display the current selected method: `senderConfigApp.exe -status`

Display usage message: `senderConfigApp.exe -h`

Image and Display

The following table describes the options available in the **Image and Display** panel of the HP ZCentral Remote Boost Sender Configuration tool. The corresponding property in the `rgsenderconfig` file is noted for reference.

Table 8-11 Image and display options and their descriptions

Option	Description
Maximum number of cores	Sets the maximum number of CPU cores on the sender that can be used for encoding. Configuration file property (Windows and Linux): <code>Rgsender.Encoder.ThreadPoolSize</code>
Maximum image update rate	Sets the maximum number of image updates per second. If set to 0, the update rate will be unlimited. The maximum value for this setting is 240. Configuration file property (Windows and Linux): <code>Rgsender.MaxImageUpdateRate</code>

Table 8-11 Image and display options and their descriptions (continued)

Option	Description
Image codec	<p>Sets the order of codecs to use for all transmitted image data. If a codec is not currently supported with the system, the next codec in the list will be tried. The available codecs are as follows:</p> <ul style="list-style-type: none"> • <code>HP3</code>: This codec has been the default since RGS 5.0. • <code>Lossless JPEG-LS</code>: This codec is mathematically lossless. <p>NOTE: This option has no effect if Advanced Video Compression (AVC) is enabled (see Advanced Video Compression on page 47). AVC can be configured via the receiver configuration tool (see Image and Display on page 79).</p> <p>Configuration file property (Windows and Linux):</p> <pre>Rgsender.ImageCodec.Preferred</pre> <p>NOTE: Chroma subsampling for HP3 and AVC is as follows:</p> <ul style="list-style-type: none"> • Chroma sampling for HP3 is 4 : 4 : 4 • Chroma subsampling for AVC is 4 : 2 : 0

Network (Sender)

The following table describes the options available in the **Network** panel of the HP ZCentral Remote Boost Sender Configuration tool. The corresponding property in the `rgsenderconfig` file is noted for reference.


 **IMPORTANT:** When you set Network properties manually via the command line or the `rgsenderconfig` file, time value is set in milliseconds. See [Setting HP ZCentral Remote Boost properties manually on page 93](#) for more information.

Table 8-12 Network options and their descriptions

Option	Description
Error timeout (seconds)	<p>Sets the time in seconds that HP ZCentral Remote Boost Sender will wait before ending the connection after failing to detect HP ZCentral Remote Boost Receiver.</p> <p>Configuration file property (Windows and Linux):</p> <pre>Rgsender.Network.Timeout.Error</pre>
Listen for connections on all network interfaces	<p>When enabled, HP ZCentral Remote Boost Sender listens for connections on all network interfaces.</p> <p>Configuration file property (Windows and Linux):</p> <pre>Rgsender.Network.IsListenOnAllInterfacesEnabled</pre>
Listen to a specific network interface	<p>Specifies the network interfaces where HP ZCentral Remote Boost Sender will listen for connections.</p>

Table 8-12 Network options and their descriptions (continued)

Option	Description
	<p>See Sender network interface binding on page 104 for more information about how to determine the interface index that corresponds with each network interface.</p> <p>NOTE: This option is not available if the Listen for connections on all network interfaces option is enabled.</p> <p>Configuration file property (Windows and Linux):</p> <pre>Rgsender.Network.Interface.<n>.IsEnabled</pre> <p>NOTE: If setting the property manually, replace <n> with the number of the network interface.</p>
Listen to a specific range of IP addresses	<p>Specifies the range of IP addresses that HP ZCentral Remote Boost Sender listens to for connections on. A network interface must be enabled using the Listen to a specific network interface option, and its IP address must be in the specified range.</p> <p>NOTE: This option is not available if the Listen for connections on all network interfaces option is enabled.</p> <p>Configuration file property (Windows and Linux):</p> <pre>Rgsender.Network.AllowIpAddressSubnet</pre>
HP ZCentral Remote Boost Sender network port	<p>Specifies the port to use for communication between HP ZCentral Remote Boost Sender and HP ZCentral Remote Boost Receiver.</p> <p>IMPORTANT: This setting must match the port setting on HP ZCentral Remote Boost Receiver.</p> <p>Configuration file property (Windows and Linux):</p> <pre>Rgsender.Network.Port</pre>

HP Velocity

The following table describes the options available in the **HP Velocity** panel of the HP ZCentral Remote Boost Sender Configuration tool. The corresponding property in the `rgsenderconfig` file is noted for reference.



NOTE: See HP Velocity documentation for more information about HP Velocity settings.

Table 8-13 HP Velocity options and their descriptions

Option	Description
Enable HP Velocity	<p>Enables HP Velocity.</p> <p>Configuration file property (Windows/Linux only):</p> <pre>Rgsender.Network.HPVelocity.Enabled</pre>

USB

The following table describes the options available in the **USB** panel of the HP ZCentral Remote Boost Sender Configuration tool. The corresponding property in the `rgsenderconfig` file is noted for reference.

Table 8-14 USB options and their descriptions

Option	Description
ACL file name (XML)	<p>Specifies the name of the XML file that implements the Remote USB Access Control List (ACL).</p> <p>Configuration file property (Windows and Linux only):</p> <p><code>Rgsender.Usb.Acl.RuleSetPath</code></p>
ACL schema file (XSD)	<p>Specifies the name of the schema file that accompanies the Remote USB XML file.</p> <p>Configuration file property (Windows and Linux):</p> <p><code>Rgsender.Usb.Acl.SchemaPath</code></p>
Amount of time that the HP ZCentral Remote Boost Sender will wait before disconnecting all USB devices if the USB ACL file becomes inaccessible (milliseconds)	<p>Sets the amount of time in milliseconds that HP ZCentral Remote Boost Sender will wait before disconnecting all USB devices if the USB ACL file disappears or becomes inaccessible.</p> <p>NOTE: If the file is restored before expiration of the timeout period, the USB devices remain connected.</p> <p>Configuration file property (Windows and Linux):</p> <p><code>Rgsender.Usb.Acl.RuleSetErrorTimeout</code></p>

Collaboration

The following table describes the options available in the **Collaboration** panel of the HP ZCentral Remote Boost Sender Configuration tool. The corresponding property in the `rgsenderconfig` file is noted for reference.

Table 8-15 Collaboration options and their descriptions

Option	Description
Display list of users connected to the remote computer	<p>Enables the collaboration notification dialog.</p> <p>IMPORTANT: This option should normally remain enabled. When disabled, neither remote users nor local users are notified who is participating in a collaboration session. The warning dialog that is displayed when the sender is unable to blank its monitor is also prevented from being displayed.</p> <p>Configuration file property (Windows/Linux):</p> <p><code>Rgsender.IsCollaborationNotificationEnabled</code></p>
Automatically give permission for authorized collaborators to join the session	<p>When enabled, collaborators will always be accepted without having to be authorized by the primary user.</p> <p>Configuration file property (Windows/Linux):</p> <p><code>Rgsender.Collaboration.AlwaysAcceptCollaborators</code></p>

Table 8-15 Collaboration options and their descriptions (continued)

Option	Description
Deny collaboration request after (seconds)	<p>Sets the amount of time in seconds that the collaboration authentication dialog is shown before the request is denied automatically.</p> <p>NOTE: Set the value to be equal to or less than <code>Rgreceiver.Network.Timeout.Dialog</code> for all collaborating receivers. See Network (Receiver) on page 81 for more information.</p> <p>Configuration file property (Windows/Linux):</p> <p><code>Rgsender.CollabUI.Dialog.Timeout</code></p>
Enable/Disable Active Collaboration Notification	<p>Enables or disables Active Collaboration Notification.</p> <p>NOTE: Enabling or disabling Active Collaboration will automatically disable notifications on all active screens.</p> <p>Configuration file property (Windows/Linux):</p> <p><code>Rgsender.Gui.Collaboration.ActiveNotification.Enabled</code></p>
Notification Border Width	<p>Sets the width in pixels of the Active Collaboration Notification frame(s).</p> <p>NOTE: The value for this property can range between 1 and 25.</p> <p>Configuration file property (Windows/Linux):</p> <p><code>Rgsender.Gui.Collaboration.ActiveNotification.BorderWidth</code></p>
Notification Border Color	<p>Sets the color of the Active Collaboration Notification border.</p> <p>Configuration file property (Windows/Linux):</p> <p><code>Rgsender.Gui.Collaboration.ActiveNotification.BorderColor</code></p>
Delay before another user can take floor control when active user stops giving input	<p>Sets the delay in milliseconds after the active user stops making inputs before another user can take control of the floor in a collaboration session. The value can range from 500 milliseconds (0.5 seconds) to 15000 milliseconds (15 seconds).</p> <p>Configuration file property (Windows/Linux):</p> <p><code>Rgsender.RequestFloorControlTime</code></p>

Logging

The following table describes the options available in the **Logging** panel of the HP ZCentral Remote Boost Sender Configuration tool. The corresponding property in the `rgsenderconfig` file is noted for reference.

Table 8-16 Logging options and their descriptions

Option	Description
Log Level	<p>Sets the lowest level of output to the sender log file. Information for all levels that are above the specified level also outputs to the sender log file.</p> <p>Configuration file property (Windows/Linux):</p>

Table 8-16 Logging options and their descriptions (continued)

Option	Description
	<code>Rgsender.Log.Level</code>
Log file path	Specifies the path to the HP ZCentral Remote Boost Sender log file. Configuration file property (Windows/Linux): <code>Rgsender.Log.FileName</code>
Max logfile size (KB)	Sets the maximum size of the HP ZCentral Remote Boost Sender log file (in kilobytes). Configuration file property (Windows/Linux): <code>Rgsender.Log.MaxFileSize</code>

Diagnostics

The **Diagnostics** panel of the HP ZCentral Remote Boost Sender Configuration tool can be used to detect potential issues that might prevent a remote connection.

Certificate

The **Certificate** panel of the HP ZCentral Remote Boost Sender Configuration tool allows the Certificate that is presented by the Sender to all incoming Receivers to be changed. The corresponding property in the `rgsenderconfig` file is noted for reference.

Table 8-17 Certificates options and their descriptions

Section	Description
Certificate	Specifies which certificate will be used by the Sender. The options are: <ul style="list-style-type: none"> Automatic, File, and Certificate Store (Windows only) Configuration file property (Windows/Linux): <code>Rgsender.Network.Certificate.Source</code>
Store	Specifies which certificate store folder is used if the source is set to Certificate Store (Windows only) Configuration file property (Windows): <code>Rgsender.Network.Certificate.StoreName</code>
Certificate Details	Lists the following information about the currently selected certificate: subject, expiration, and SHA256 fingerprint.

Setting HP ZCentral Remote Boost properties manually

You can configure HP ZCentral Remote Boost properties manually.

Property syntax

The following example shows the HP ZCentral Remote Boost property syntax:

```
Rgreceiver.Network.Timeout.Warning=10000
```


In this example, the name of the property is `Rgreceiver.Network.Timeout.Warning`, and the value of the property is `10000`. This setting specifies that HP ZCentral Remote Boost Receiver will wait 10,000 milliseconds (10 seconds) before displaying a warning dialog that indicates that it is no longer able to communicate with HP ZCentral Remote Boost Sender. This particular setting is duplicated in the Network panel of the HP ZCentral Remote Boost Receiver settings.

A property could also be set to an empty value like in the following example:

```
Rgreceiver.Browser.Name=
```

Properties with empty values reset to their default values:


- If the value of the property is of type **string**, the value will be set as an empty string.
- If the value of the property is of type **int**, **int vector**, or **bool**, the value will be set to 0.

 **IMPORTANT:** No user notification is provided if a property name is misspelled, and the property will not take effect. If you specify a property in a configuration file or on the command line and it does not take effect, verify that the property name is spelled correctly (including uppercase and lowercase usage).


Setting property values in a configuration file

HP ZCentral Remote Boost property values can be set in a configuration file. The Receiver configuration file is named `rgreceiverconfig` and the Sender configuration file is named `rgsenderconfig`. On Windows, the files are located in the HP ZCentral Remote Boost Receiver or the HP ZCentral Remote Boost Sender installation directory. On Linux, the files are located in `/etc/opt/hpremote/rgreceiver` or `/etc/opt/hpremote/rgsender`. On macOS, the `rgreiverconfig` file is located in `/Library/Application Support/HP/rgreiver`.

The configuration files contain one property per line. All properties in the configuration files are initially commented out with the `#` character. To set a property in a configuration file, first delete the number sign (`#`) character preceding the property name, and then set the property to the appropriate value. For HP ZCentral Remote Boost Receiver, once a property is uncommented in the configuration file, the property's setting is persisted when HP ZCentral Remote Boost Receiver is closed.

 **IMPORTANT:** After an HP ZCentral Remote Boost Receiver property is persisted, commenting out the property in the configuration file again will not reset its value to default. To reset a value to default, set the property back to its default value in the configuration file, and leave the line uncommented.


 **NOTE:** If a property is listed more than once, the value of the last entry is used.

 **NOTE:** HP ZCentral Remote Boost properties set in a configuration file might not take effect until the computer is restarted.

Setting property values on the command line

Property values for HP ZCentral Remote Boost Receiver on Windows and Linux, and for HP ZCentral Remote Boost Sender on Windows, can be set on the command line.

For examples, see [HP ZCentral Remote Boost Receiver command-line options on page 27](#) and [HP ZCentral Remote Boost Sender command-line options \(Windows\) on page 30](#).


 **NOTE:** Per-session property values cannot be set on the command line.

Making a property immutable

The following section describes how to make properties immutable.

Every property can be locked down to prevent changing its value via one of the following sources:

- Inside the application
- User launch file
- Command Line
- Automation API restriction

 **NOTE:** In order to lock a property with Automation API restriction its mutability must be set to zero. This is done manually by adding the `IsMutable` variation of any property to the administrator config file.

The following is an example of the syntax for locking a property:

The property to lock:

```
Rgreceiver.Network.Timeout.Warning=10000
```

The properties `IsMutable` variant:

```
Rgreceiver.Network.Timeout.Warning.IsMutable=0
```

Once a property has been set to immutable its value and mutability state cannot be changed by any of the sources listed above.


Automation API restriction control

The following section describes how to change the restriction state for the automation API.

The default configuration of the Receiver initializes the automation API to be in a restricted state. This means that if a property is made Immutable, any requests on the automation API will not be initiated. This behavior can be changed via the property:

```
Rgreceiver.Properties.AutomationApi.UnRestricted
```

This property can only be changed using the administrator configuration file. If this property is set to “1” any requests on the automation API to change the value or mutability of a property will be initiated.

 **IMPORTANT:** The automation API is accessible to the local user. Therefore, by enabling the property above, any property may be changed by utilizing the automation API. This means there is a path for non-administrator users to bypass any properties the administrator has made immutable.

Other properties

This section describes the HP ZCentral Remote Boost properties that do not have a corresponding option in the configuration tools and can only be set via the configuration file or on the command line.

Other global properties

Global properties persist through multiple sessions.

Table 8-18 Other global properties and their descriptions

Property	Description
<code>Rgreceiver.Network.CertificateVerification.CA.Path</code>	<p>This property sets the full path to a file containing all Certificate Authorities (CAs) that are present in the certificate chain of the sender certificate.</p> <p>If the certificate chain contains multiple CAs (for example, a root CA and an intermediate CA), then this file contains concatenation of the multiple CAs.</p>
<code>Rgreceiver.Network.CertificateVerification.CA.Location</code>	<p>NOTE: Windows only</p> <p>This property specifies the context used by the certificate chain validation.</p> <p>Possible values for this property are <code>CurrentUser</code> or <code>LocalMachine</code>. If not defined, the default value is <code>CurrentUser</code>.</p>
<code>Rgreceiver.Network.CertificateVerification.CheckName</code>	<p>This property specifies if certificate host name verification is enabled. If enabled, the receiver tries to match the hostname of the sender you are connecting to with the name registered on the sender certificate. If the hostname does not match the common name, any subject alternative names are checked as well.</p>
<code>Rgreceiver.Network.CertificateVerification.MaxChainSize</code>	<p>This property specifies the maximum depth of a trusted peer's certificate chain, including the peer's certificate.</p> <p>If not defined, the default value is 4.</p> <p>A value of 0 accepts chains of any length.</p> <p>HP recommends setting this property to the lowest possible value that still allows a connection to the sender.</p> <p>NOTE: On the macOS Receiver, if you are also using the <code>Rgreceiver.Network.CertificateVerification.CA.Path</code> property and if your CA file contains multiple certificates (root and intermediate CAs), then the <code>MaxChainSize</code> property will not work correctly. If you want to use the <code>MaxChainSize</code> property on macOS, HP recommends that you configure the sender to send the intermediate CAs instead of having them in the receiver CA file. If you do not want to configure the sender to send the intermediate CAs, then alternatively, on the Receiver side, you can add the root CA and intermediate CAs to the macOS certificate store, and disable the <code>Rgreceiver.Network.CertificateVerification.CA.Path</code> property.</p>
<code>Rgreceiver.WindowMode</code>	<p>This property sets the initial HP ZCentral Remote Boost Receiver window state after a connection is established. Possible values are <code>bordered</code>, <code>borderless</code>, <code>maximized</code>, and <code>fullscreen</code>.</p>
<code>Rgreceiver.WindowMode.IsMutable</code>	<p>When enabled, allows the user to modify the current HP ZCentral Remote Boost Receiver window state.</p>
<code>Rgreceiver.IsScalingEnabled</code>	<p>This property sets the initial Pixel Mode after a connection is established. If set to <code>true</code>, Scaled Pixel Mode is used. If set to <code>false</code>, 1:1 Pixel Mode is used instead.</p>
<code>Rgreceiver.IsScalingEnabled.IsMutable</code>	<p>When enabled, allows the user to switch between the two Pixel Modes: Scaled and 1:1.</p>

Table 8-18 Other global properties and their descriptions (continued)

Property	Description
<code>Rgreceiver.Smartcard.IsEnabled</code>	When enabled, the receiver uses smart card redirection with senders that have smart card redirection installed and enabled.
<code>Rgsender.Smartcard.IsEnabled</code>	When enabled and smart card redirection is installed, the receiver is allowed to use smart card redirection.
<code>Rgreceiver.IsSendCtrlLeftMouseClickedAsRightMouseClickEnabled</code>	<p>NOTE: macOS only</p> <p>When enabled, if you simultaneously press and hold <code>ctrl</code> and click the left mouse button, the combination is translated to a right-click and sent to the sender.</p> <p>When disabled, if you simultaneously press and hold <code>ctrl</code> and click the left mouse button, the combination is sent to the sender with no modification.</p>
<code>Rgreceiver.Experience.IsMutable</code>	When enabled, a user can modify the settings under the Experience heading in HP ZCentral Remote Boost Receiver.
<code>Rgreceiver.Audio.Linux.DeviceName</code>	<p>NOTE: Linux only</p> <p>This property specifies the name of the audio device that is to be used.</p>
<code>Rgreceiver.Touch.IsNoDelayModeEnabled</code>	<p>NOTE: Windows only</p> <p>When enabled, there is no delay when dragging using touch input. However, most customizable gestures do not work, except for the three-finger press and four-finger press gestures. Most default gestures like pinch (zoom), two-finger swipe (pan) and three-finger swipe (scroll) still work.</p>
<code>Rgreceiver.EnableLegacySecurity</code>	When enabled, allows the use of legacy security settings, enabling connection to HP RGS 7.4 and earlier senders without configuring certificates. Not recommended for highest security.
<code>Rgsender.ConsoleLogonTimeout</code>	This property sets the time in seconds to wait for a system login event to complete. If the login does not occur within this limit, the sender will be shut down.
<code>Rgsender.IsClassicEasyLogonEnabled</code>	For Windows, this property enables multiple users to connect to a locked desktop before logon. For Linux, this property enables Easy Login.
<code>Rgsender.Audio.Linux.DeviceName</code>	<p>NOTE: Linux only</p> <p>This property specifies the name of the audio device that is to be used.</p>
<code>Rgsender.Audio.Linux.RecorderApi</code>	<p>NOTE: Linux only</p> <p>If set to <code>pulse</code> (the default), audio is captured using PulseAudio. If set to <code>alsa</code>, audio is captured using the ALSA audio system.</p>
<code>Rgsender.Audio.Linux.IsVolumeMonitorEnabled</code>	<p>NOTE: Linux only</p> <p>When enabled, HP ZCentral Remote Boost Sender tracks volume changes on the sender side, and HP ZCentral Remote Boost Receiver adjusts its volume level automatically in response.</p>
<code>Rgsender.PreferredLicenseOrder</code>	This property sets the preferred order in which HP ZCentral Remote Boost will look for each license type.
<code>Rgsender.Compatibility.Displays.ConfigureVmwareDisplaysForBestPerformance</code>	NOTE: For VMware® with a Windows guest operating system only

Table 8-18 Other global properties and their descriptions (continued)


Property	Description
	<p>When enabled, this property disables the VMware SVGA 3D display at the start of an HP ZCentral Remote Boost connection, enables any available NVIDIA displays, and forces the GPU display method to be used.</p> <p>NOTE: If this property is enabled, you cannot access any VMware virtual machines via the VMware vSphere® console, because that function requires the VMware SVGA 3D display. To re-enable the VMware SVGA 3D display when an HP ZCentral Remote Boost connection ends, use the property <code>Rgsender.Compatibility.Displays.ReEnableVmwareDisplaysOnRGSDisconnect</code>.</p> <p>The VMware SVGA 3D display can also be re-enabled by logging out of Windows. This ensures that the vSphere console is accessible when no users are logged on.</p>
<code>Rgsender.Compatibility.Displays.ReEnableVmwareDisplaysOnRGSDisconnect</code>	<p>NOTE: For VMware with a Windows guest operating system only</p> <p>When enabled, this property causes the VMware SVGA 3D display to be re-enabled when an HP ZCentral Remote Boost connection ends. This allows you to access a VMware virtual machine via the vSphere console without having to log out of Windows first.</p> <p>NOTE: HP recommends disabling this setting if you do not use the vSphere console, because Windows might rearrange your application windows between HP ZCentral Remote Boost connections.</p>
<code>Rgsender.Compatibility.Displays.AllowNvidiaResolutionMatching</code>	<p>NOTE: For Windows-based senders with NVIDIA graphics only</p> <p>When enabled, HP ZCentral Remote Boost Sender attempts NVIDIA resolution-matching before attempting the default resolution-matching method.</p>
<code>Rgsender.Compatibility.Displays.ForceEdidOnHeadless</code>	<p>NOTE: For Windows-based senders with NVIDIA Quadro graphics only</p> <p>When enabled, HP ZCentral Remote Boost Sender attempts to load an EDID, if the system is not connected to a monitor.</p> <p>NOTE: To use this property, there must not be any monitors connected to the sender when the HP ZCentral Remote Boost Sender service starts; otherwise, the system is not considered headless and no EDID is loaded.</p> <p>NOTE: The EDID remains loaded until this property is disabled.</p>
<code>Rgsender.Compatibility.Cursor.PreferredCursorMethod</code>	<p>NOTE: For Windows 7-based VMs with NVIDIA graphics only</p> <p>Enables the cursor when ESXi is in use. If the cursor is not displayed, set the property to <code>generic</code>.</p> <p><code>generic</code>: Use a generic cursor method.</p>
<code>Rgsender.KerberosLogon</code>	<p>NOTE: Linux only</p> <p>Allows a Kerberos HP ZCentral Remote Boost authentication ticket to be used for login. You must select the user name or enter it manually. Possible values are as follows:</p> <p><code>Off</code>: The Kerberos ticket will not be used for login.</p> <p><code>On</code>: The Kerberos ticket will be used for login.</p>

Table 8-18 Other global properties and their descriptions (continued)

Property	Description
	Persist: The Kerberos ticket can be used for login and will continue to be available for the lifetime of the HP ZCentral Remote Boost connection. The ticket can potentially be used for other authentication activities such as unlocking the desktop.
<code>Rgreceiver.Registration.IsEnabled</code>	Enables activation of HP ZCentral Remote Boost Advanced Features.
<code>Rgsender.Gui.Invitation.FilterPrivateAddresses</code>	When enabled, collaboration invitations do not list private addresses. NOTE: If the sender listens only on private addresses, private addresses are listed regardless of this setting.

Per-session properties (HP ZCentral Remote Boost Receiver only)

The per-session properties of HP ZCentral Remote Boost Receiver let you specify settings for each HP ZCentral Remote Boost session individually.

 **NOTE:** When typing per-session properties, replace `<n>` with the number of the session. The first session is 0, the second session is 1, and so on.

Window location and size properties (per-session)

The following properties determine the window location and size.

Table 8-19 Window location and size properties and their descriptions

Property	Description
<code>Rgreceiver.Session.<n>.RemoteDisplayWindow.X</code>	This property sets the horizontal position of the HP ZCentral Remote Boost Receiver window for session number <code><n></code> , as measured from the left edge of the primary screen. The default is 0.
<code>Rgreceiver.Session.<n>.RemoteDisplayWindow.Y</code>	This property sets the vertical position of the HP ZCentral Remote Boost Receiver window for session number <code><n></code> , as measured from the top edge of the primary screen. The default is 0. NOTE: On Windows 10, the window might have a small offset from the specified position. You can adjust this offset by decreasing the value of <code>RemoteDisplayWindows.X</code> and/or <code>RemoteDisplayWindows.Y</code> by 7.
<code>Rgreceiver.Session.<n>.RemoteDisplayWindow.Height</code>	This property sets the height of the HP ZCentral Remote Boost Receiver window for the session number <code><n></code> . If this setting is set to 0, the window uses the height of the sender display. The default is 0.
<code>Rgreceiver.Session.<n>.RemoteDisplayWindow.Width</code>	This property sets the width of the HP ZCentral Remote Boost Receiver window for session number <code><n></code> . If this setting is set to 0, the window uses the width of the sender display. The default is 0.

You can use the `RemoteDisplayWindow` properties along with the `Display` properties (see [Using display properties to set resolution and layout on page 60](#)) to configure the number of displays on the sender and window size and location on the receiver.

For example, the following properties define two 1920 × 1200 displays on the sender that will be positioned side by side. The HP ZCentral Remote Boost receiver window will span a width of 3840 pixels. If the receiver has three 1920 × 1200 displays, the HP ZCentral Remote Boost receiver window will appear on two of the displays, and the third display will show the local receiver desktop.

```
Rgreceiver.Session.0.Display.1.X=0
Rgreceiver.Session.0.Display.1.Y=0
Rgreceiver.Session.0.Display.1.Width=1920
Rgreceiver.Session.0.Display.1.Height=1200
Rgreceiver.Session.0.Display.1.Orientation=0
Rgreceiver.Session.0.Display.2.X=1920
Rgreceiver.Session.0.Display.2.Y=0
Rgreceiver.Session.0.Display.2.Width=1920
Rgreceiver.Session.0.Display.2.Height=1200
Rgreceiver.Session.0.Display.2.Orientation=0
Rgreceiver.Session.0.RemoteDisplayWindow.X=0
Rgreceiver.Session.0.RemoteDisplayWindow.X.IsMutable=0
Rgreceiver.Session.0.RemoteDisplayWindow.Y=0
Rgreceiver.Session.0.RemoteDisplayWindow.Y.IsMutable=0
Rgreceiver.Session.0.RemoteDisplayWindow.Width=3840
Rgreceiver.Session.0.RemoteDisplayWindow.Width.IsMutable=0
Rgreceiver.Session.0.RemoteDisplayWindow.Height=1200
Rgreceiver.Session.0.RemoteDisplayWindow.Height.IsMutable=0
```

Clipboard properties (per-session)

These clipboard properties are per-session.

Table 8-20 Clipboard properties and their descriptions

Property	Description
<code>Rgreceiver.Session.<n>.Clipboard.IsEnabled</code>	<p>1=Enables Remote Clipboard for session number <n> (default). The global property <code>Rgreceiver.Clipboard.IsEnabled</code> must be enabled for this to have any effect.</p> <p>0=Disables Remote Clipboard for session number <n>.</p>

Auto-launch properties

Auto-launch files for HP ZCentral Remote Boost Receiver have the extension `.rgreceiver` and use the same syntax for setting property values as `rgreceiverconfig`.

Use a text editor to create an auto-launch file. You can customize your auto-launch file for your environment using both the properties described in this section and other Receiver properties described throughout this guide.

See [Setting HP ZCentral Remote Boost properties manually on page 93](#).

When an auto-launch file is opened, HP ZCentral Remote Boost Receiver starts automatically and attempts to establish a connection to a single sender, as configured in the file.



NOTE: Auto-launch files do not support starting HP ZCentral Remote Boost connections to multiple senders. For information about connecting to multiple senders, see [Directory Mode on page 73](#).

The following table describes the auto-launch properties. Because you can auto-launch only one connection at a time, the session number should always be 0.

Table 8-21 Auto-launch properties and their descriptions

Property	Description
<code>Rgreceiver.Session.0.IsConnectOnStartup</code>	If this property is enabled, HP ZCentral Remote Boost Receiver will attempt to auto-launch the connection when the auto-launch file is opened.
<code>Rgreceiver.Session.0.Hostname</code>	This property sets the hostname or IP address for the auto-launch connection.
<code>Rgreceiver.Session.0.Username</code>	This property sets the user name for the auto-launch connection as a UTF-8 encoded string.
<code>Rgreceiver.Session.0.Password</code>	This property sets the password for the auto-launch connection as a UTF-8 encoded string.
<code>Rgreceiver.Session.0.PasswordFormat</code>	<p>Encrypted=This password format is supported on Windows only and is the hexadecimal string representation of the password encrypted using the Windows command <code>CryptProtectData</code>. See http://msdn.microsoft.com/en-us/library/aa380261(VS.85).aspx for more information.</p> <p>XOR=This password format is the hexadecimal string representation of a password encrypted using an XOR cipher using a key of 129.</p>

Settings from the auto-launch file take precedence over any property settings from the HP ZCentral Remote Boost Receiver Configuration tool (or the `rgreiverconfig` file).

See the following for an example.

```
Rgreceiver.Session.0.IsConnectOnStartup=1  
Rgreceiver.Session.0.Hostname=192.168.0.47  
Rgreceiver.Session.0.Username=MyUserName  
Rgreceiver.Session.0.Password=MyPassword  
Rgreceiver.Session.0.PasswordFormat=Encrypted  
Rgreceiver.Network.Timeout.Error=60000  
Rgreceiver.Network.Timeout.Warning=4000  
Rgreceiver.Network.Timeout.Dialog=30000
```

```
Rgreceiver.WindowMode=bordered
```

9 Troubleshooting

If you are experiencing an issue with HP ZCentral Remote Boost, use the relevant troubleshooting section.

Failed connection attempts

This section describes the most common issues that cause HP ZCentral Remote Boost connection attempts to fail.

Receiver checklist

Use the following checklist to troubleshoot failed connection attempts from the receiver side:

1. Verify that you are entering the correct hostname or IP address for the sender.

If you changed the port that HP ZCentral Remote Boost Sender listens on from its default of 42966, you must specify the port number along with the hostname or IP address like in the following examples:

```
MyHostName:12345
```

```
192.168.0.10:12345
```

2. Verify that the receiver is on the same network as the sender.
3. Verify that the receiver can ping the sender.
4. If the receiver is behind a firewall, verify that the firewall supports network address translation (NAT).

Sender checklist

Use the following checklist to troubleshoot failed connection attempts from the sender side:



NOTE: After going through this checklist, be sure that you log out of the sender before attempting an HP ZCentral Remote Boost connection again.

1. Verify the credentials for the user account you are trying to access from the receiver. The account password cannot be blank.
2. Verify that HP ZCentral Remote Boost Sender has started on the sender (see [HP ZCentral Remote Boost Sender overview on page 29](#) for more information).
3. Verify that all tests pass on the Diagnostics panel of the HP ZCentral Remote Boost Sender Configuration tool.
4. If the sender is behind a firewall, verify that the firewall supports network address translation (NAT) and port forwarding.
5. If you changed the network interface binding of HP ZCentral Remote Boost Sender from its default of listening to all network interfaces, verify that the sender is listening on the correct network interface (see [Sender network interface binding on page 104](#) for more information).

6. (Windows only)

Verify that the sender is not using Automatic Private IP Addressing (APIPA) by typing the following in a command window:

```
netstat -n -a
```

If the IP address associated with the HP ZCentral Remote Boost Sender listening port (42966 by default) is private, APIPA is the likely cause. For information about how to disable APIPA, go to <http://support.microsoft.com/kb/220874>.

7. (Linux only)

- a. Verify that the sender is not using an X desktop started on the command line. The `rgsender` service waits for an X server to be started by the system display manager. The `rgsender` service logs information to the `/var/opt/hpremote/rgsender/rg-svc.log` file. Examine this file for error messages.
- b. Linux systems joined to a Windows domain might require files to be configured in the `/etc/sss` folder. After joining the system to the domain, install the HP ZCentral Remote Boost Sender after to allow these files to be created with proper values.

Kerberos

Kerberos authentication is available only on a Windows receiver. The receiver must be connected to the same Windows domain as the Windows or Linux sender. Kerberos authentication requires that the HP ZCentral Remote Boost Receiver and HP ZCentral Remote Boost Sender systems have synchronized clocks. Some tolerance is allowed for clock differences. The tolerance is dependent on parameters setup on the domain controller. In order to allow the Kerberos ticket to be used for login on the sender, the `Rgsender.KerberosLogon` property needs to be set and the domain controller needs to have delegation enabled for the computer. This feature may not be configured for all services. Other PAM services may be able to authenticate with the Kerberos ticket by adding `auth sufficient pam_rg.so` to the associated PAM service in `/etc/pam.d`. This must be added before the authentication line that includes `password-auth`, `system-auth`, or `common-auth`.

A Linux sender must be identified by the hostname and not an IP address in order for the receiver to obtain the necessary service ticket. The service ticket for a host with the name `hostname.example.com` can be seen by running the command line program `klist` on the receiver. This ticket will be listed with the server name `host/hostname.example.com`.

Sender network interface binding

HP ZCentral Remote Boost Sender is set by default to listen to all network interfaces present on the sender. You can configure a different network interface binding.

There are three methods to reconfigure HP ZCentral Remote Boost Sender network interface binding:

- Disable the network interfaces that you do not want HP ZCentral Remote Boost Sender to listen to, and then restart the sender. HP ZCentral Remote Boost Sender then binds to the remaining enabled network interface. The disadvantage of this method is that the other network interfaces are no longer usable.
- Manually configure the network interface that you want HP ZCentral Remote Boost Sender to listen to. See [Reconfiguring network interface binding manually on page 105](#) for more information.
- Use the HP ZCentral Remote Boost Sender Configuration tool to specify which network interface to listen to. See [Reconfiguring network interface binding using the HP ZCentral Remote Boost Sender Configuration tool on page 105](#) for more information.

If you enter a host name instead of an IP address when establishing an HP ZCentral Remote Boost connection, the host name might resolve to an incorrect network interface. This could be caused by a number of factors, including how your DHCP and DNS servers are configured.

If the host name resolves to the IP address of an incorrect network interface, choose one of the following options:

- Enter the IP address that HP ZCentral Remote Boost Sender is bound to instead of the host name when establishing an HP ZCentral Remote Boost connection. You can use the **Listen to a specific range of IP addresses** setting in the sender configuration tool or the `Rgsender.Network.AllowIpAddressSubnet` property in the `sender config` file. See [Network \(Sender\) on page 89](#) for more information.
- Reconfigure your DHCP and DNS servers so that the host name resolves to the correct IP address.
- Use the `nslookup` command to determine the IP address where the host name resolves, and then follow the steps in [Reconfiguring network interface binding manually on page 105](#) to set the corresponding network interface to be listed first in the list of connections.

Reconfiguring network interface binding manually

Use these steps to manually configure which network interface the sender binds.

1. Disable the **Listen for connections on all network interfaces** option in the HP ZCentral Remote Boost Sender Configuration tool.



NOTE: See [HP ZCentral Remote Boost Sender Configuration tool \(Windows/Linux only\) on page 86](#) for more information.

2. Select the network icon in the Windows notification area, and then select **Network and Internet settings**.
3. Select **Change adapter options** in the **Status** panel. The **Network Connections** window opens.
4. Press the **Alt** key to show the menu bar, select **Advanced**, and then select **Advanced Settings**.
5. In the **Provider Order** panel, use the arrow buttons next to the **Network providers** pane to move the network interface that you want to the top of the list.

HP ZCentral Remote Boost Sender will listen to the network interface at the top of the list.

Reconfiguring network interface binding using the HP ZCentral Remote Boost Sender Configuration tool

To reconfigure the network interface binding using the HP ZCentral Remote Boost Sender Configuration tool, you must determine the number that corresponds to the network interface and then configure the appropriate settings.

Determining the number that corresponds to the network interface

Before configuring options in the HP ZCentral Remote Boost Sender Configuration tool, you must determine the number that corresponds to the network interface you want HP ZCentral Remote Boost Sender to listen to.

1. Select the network icon in the Windows notification area, and then select **Network and Internet settings**.
2. Select **Change adapter options** in the **Status** panel.
3. Press the **Alt** key to show the menu bar, select **Advanced**, and then select **Advanced Settings**.

4. In the **Provider Order** panel, look at the list of network interfaces in the **Index** pane.

The index of the network interface at the top of the list is **0**. The number for the next network interface in the list is **1**, and so on.

Configuring the HP ZCentral Remote Boost Sender settings

After determining the network interface index that you want, follow these steps to configure the appropriate HP ZCentral Remote Boost Sender settings:

1. Disable the **Listen for connections on all network interfaces** option in the HP ZCentral Remote Boost Sender Configuration tool.
2. Set the value of the **Listen to a specific network interface** option in the HP ZCentral Remote Boost Sender Configuration tool to the index of the network interface.



NOTE: See [HP ZCentral Remote Boost Sender Configuration tool \(Windows/Linux only\) on page 86](#) for more information.

Network timeouts

The network timeout properties of HP ZCentral Remote Boost Receiver and HP ZCentral Remote Boost Sender provide a way to handle network disruptions. Although TCP/IP is reliable, it does not guarantee network packet delivery. Possible issues include the following:

- Network over-subscription, resulting in congestion and packet loss
- CPU utilization by other processes and tasks, starving the TCP/IP network stack
- Incorrectly configured or malfunctioning network switches, routers, and network interfaces

See the following sections for a list of timeout-related issues and solutions.

The HP ZCentral Remote Boost Receiver window repeatedly dims and displays a connection warning message

To resolve this connection warning message, use the following solution.

Cause	Solution
There are frequent network disruptions between HP ZCentral Remote Boost Receiver and HP ZCentral Remote Boost Sender.	If the notifications are occurring too frequently, increase the HP ZCentral Remote Boost Receiver warning timeout value.

The HP ZCentral Remote Boost Receiver window dims, and HP ZCentral Remote Boost Receiver disconnects and displays a connection error, but you can connect again immediately

To resolve this connection issue, use the following solution.



NOTE: This could also occur if HP ZCentral Remote Boost Sender was stopped unexpectedly.

Cause	Solution
The length of the network disruption exceeded the error timeout value of either HP ZCentral Remote Boost Receiver or HP ZCentral Remote Boost Sender.	Increase the error timeout value of HP ZCentral Remote Boost Receiver, HP ZCentral Remote Boost Sender, or both.

When connecting to a Linux-based sender, the PAM authentication dialog on the receiver does not display long enough for credentials to be entered

To resolve this connection issue, use the following solution.

Cause	Solution
The HP ZCentral Remote Boost Receiver dialog timeout value is too low.	Increase the dialog timeout value of HP ZCentral Remote Boost Receiver.

When connecting to the sender, the authorization dialog is not displayed long enough for the user to respond to it

To resolve this connection issue, use the following solution.

Cause	Solution
The collaboration request timeout value of HP ZCentral Remote Boost Sender is too low.	Increase the collaboration request timeout value of HP ZCentral Remote Boost Sender.

The HP ZCentral Remote Boost Receiver window is not updating

To resolve this connection issue, use the following solution.

Cause	Solution
A network disruption occurred, but the warning and error timeout values of HP ZCentral Remote Boost Receiver are set too high.	Decrease the warning and error timeout values of HP ZCentral Remote Boost Receiver.

Increasing the error timeout value of HP ZCentral Remote Boost Receiver does not appear to have an effect, and HP ZCentral Remote Boost Receiver still disconnects

To resolve this connection issue, use the following solution.

Cause	Solution
The error timeout value of HP ZCentral Remote Boost Sender is less than that of HP ZCentral Remote Boost Receiver.	Increase the error timeout value of HP ZCentral Remote Boost Sender so that its higher than that of HP ZCentral Remote Boost Receiver.

Graphical issues (Linux)

Use these sections to resolve graphical issues on Linux.

Full-screen crosshair cursors

Some software uses large crosshair cursors that might not display correctly on the receiver. Full-screen crosshair cursors can be disabled by typing the following in an X terminal:

```
xprop -root -remove _SGI_CROSSHAIR_CURSOR
```

Gamma correction on the receiver

The color in a 3D application on the sender can look incorrect when displayed on a receiver. This is because the gamma of the receiver monitor does not match the gamma of the sender monitor.

Any tool that can adjust the gamma for a display can help resolve this issue. Some tools adjust the gamma for the entire display, while others adjust the gamma on a per-window basis. A per-window tool that can adjust the HP ZCentral Remote Boost Receiver window only should provide the best results.

Black or blank HP ZCentral Remote Boost Receiver window

If the sender is set to less than 24 bit or 32 bit color depth (depending on the graphics adapter), the HP ZCentral Remote Boost Receiver window might display a black or blank desktop session. Increase the color depth of and restart the sender usually resolves the issue.

High DPI display issues

HP ZCentral Remote Boost is DPI based and scales UI elements to be more readable depending on the resolution (Linux) or display scale factor (Windows).

For optimal performance, consider the following:

- On Windows, scaling is done on integral scale factors only. (That is, 100%, 200%, and so on.) Nonintegral scale factor values, such as 150%, are rounded to the nearest integral value. Therefore, HP ZCentral Remote Boost might appear to be scaled more or less than other applications.
- Windows supports per-monitor scaling. If multiple monitors are configured with different scale factors, you might need to resolve the following issues:
 - When HP ZCentral Remote Boost UI windows are moved from one screen to another, they are repainted to the new screen scale factor. This can cause visual artifacts in the title bar from the repaint. To remove these artifacts, minimize and restore each window.
 - If the receiver is in 1:1 Pixel Mode, the new window size does not match the content it previously displayed. To resolve this issue, either resize the window to fit the sender window using the ++ hotkey sequence, or switch to Scaled Pixel Mode using the receiver toolbar.
 - In some instances where there is a large difference in scaling between the monitors, the toolbar may become inaccessible in one of the monitors. In these cases, we recommend either changing the scaling on all monitors to the same value or disabling the `Rgreceiver.EnableHighDPIScaling` property.

Disabling or enabling support for high DPI displays

To disable or enable support for high DPI displays:

- ▲ On HP ZCentral Remote Boost Receiver, modify the following property in the configuration file:

```
Rgreceiver.EnableHighDPIScaling
```

- 0: DPI awareness is disabled.
- 1: DPI awareness is enabled. This is the default setting.

Input issues

See the following sections for a list of input-related issues and solutions.

Keystrokes are repeated when connected to Linux Sender

To resolve this input issue, disable key repeats or lengthen the delay before a key repeat occurs by using `xset` on the Linux Sender.



NOTE: The following options must be set every time you run HP ZCentral Remote Boost.

To disable key repeat, use the following command:

```
xset -r
```

To lengthen the delay before a key repeat occurs, use the following command:

```
xset r rate <delay in milliseconds>
```



NOTE: By default, the autodelay repeat is typically 500 ms. Start by increasing this delay to approximately the duration of your connection latency.

Remote Audio issues

See the following sections for a list of audio-related issues and solutions.

HP ZCentral Remote Boost Receiver is not producing audio

To resolve this audio issue, use the following solution.

Cause	Solution
Audio disabled	<ul style="list-style-type: none">• Verify that Remote Audio is enabled in the Receiver settings.• Verify that audio is not disabled in the Sender and Receiver configuration files.

Cause	Solution
Audio device not enabled or working	<ul style="list-style-type: none"> • Verify that the audio device is working on the Receiver. • If an audio device is not enabled when the Windows Sender is installed, a virtual audio device will be installed. If the audio device on the Sender is disabled after the Sender is installed, applications cannot generate audio. Reinstall the Sender with all audio devices disabled to install the virtual audio driver. • If an audio device is not available at the time pulseaudio starts on Linux, a null sink should be loaded because the pulseaudio module-alsa-sink module is being loaded. The null sink works as a virtual audio device. The Sender on Linux can capture an audio signal even when the output device is the null sink.
Cause	Solution
Audio follows focus enabled	<ul style="list-style-type: none"> • When Audio follows focus is enabled, the Receiver will not play audio until the Receiver window has focus.
Cause	Solution
Volume is too low	<ul style="list-style-type: none"> • Adjust volume and mute settings in all locations that can affect audio. These locations can include application-specific settings on Sender, settings in the Sender system volume mixer (available in Windows taskbar), system volume level on the Sender, settings in the Receiver system volume mixer (available in Windows taskbar), and system volume level on the Receiver.
Cause	Solution
Audio service restarted	<ul style="list-style-type: none"> • If the Windows Audio service restart on Windows or the pulseaudio user service restarts on Linux, the connection to the audio service can be lost resulting in loss of audio. Disable and then enable audio in the Receiver settings window to reconnect to the audio service.

Audio is disrupted

To resolve this audio issue, use the following solution.

Cause	Solution
Insufficient resources	<ul style="list-style-type: none"> • If CPU utilization is high on the Sender or Receiver, audio data might not be sent or processed on time. Investigate the cause of excessive CPU utilization. • When you use the Sender on a virtual machine, the other virtual machines on the same hypervisor can affect the performance of the virtual machine. Consider adding more CPU resources to the virtual machine or balancing load on the hypervisor to give the Sender time to process data on time.

Cause	Solution
Poor networking	<ul style="list-style-type: none"> A network connection with low bandwidth, high latency, or high jitter results in audio discontinuities. Alter networking connection to improve network performance.
Cause	Solution
Audio over Remote USB	<ul style="list-style-type: none"> USB requires a response to a previous request before it will send additional data. The quality of the audio signal can be affected by network performance and choices made in the USB driver. If only speakers are needed, consider using Remote Audio instead of Remote USB by disabling Remote USB.

There is no audio on a sender or a receiver with multiple audio devices

To resolve this audio issue, use the following solution.

Cause	Solution
Capture or playing to wrong device	<ul style="list-style-type: none"> Changes to the audio devices can cause audio to be captured or played back to an unexpected device. Verify that the Receiver and Sender have the default audio device set to the expected device. Disable and then enable audio in the Receiver settings window to reconnect to the default devices.

Remote USB issues

The following information describes Remote USB troubleshooting tips.

- Verify that Remote USB is enabled in HP ZCentral Remote Boost Receiver.
- Verify that the USB device is physically connected to the receiver, powered, and turned on.
- Verify that the USB device is detected by the receiver.
 - Windows: Verify that Device Manager shows an instance of **HP Remote Physical USB** under **Universal Serial Bus controllers** for each device that is remotely connected to the Sender.
 - ThinPro: Run the command `lsusb -t` in a terminal and look for `Driver=usb-remote`. This driver confirms that the device was claimed by the **usb-remote** driver and can potentially be used with Remote USB.
- Verify that the USB device is detected by the sender.
 - Windows: Verify that the USB device is listed in Device Manager. Open Device Manager, select **HP Remote Virtual USB**, enable **Devices by Connection** from the **View** menu, and verify devices listed under **HP Remote Virtual USB**.
- Verify that both the sender and the receiver support Remote USB (see [Remote USB \(Windows and ThinPro only\) on page 69](#)).
- Verify that the USB device is supported (see [Remote USB \(Windows and ThinPro only\) on page 69](#)).
- Uninstall and reinstall HP ZCentral Remote Boost Receiver to be sure that Remote USB is configured correctly during installation (see [Installing HP ZCentral Remote Boost Receiver \(Windows\) on page 7](#)).

- Uninstall and reinstall HP ZCentral Remote Boost Sender, and be sure that Remote USB is enabled during installation (see [Installing HP ZCentral Remote Boost Sender \(Windows\) on page 10](#)).
- Verify that the drivers and software required by the USB device are installed and available on the sender. Many USB devices require manufacturer-supplied software to work. This software must often be installed before the USB device is connected to the computer.

Smart card redirection issues

Consider the following when troubleshooting smart card redirection:

- Verify that the smart card works standalone on both ends of a connection.
- Verify that vendor drivers are installed for the smart card reader and the smart card devices.
- Be sure that only the primary user is attempting to use a smart card.
- Verify that there is only one active smart card connected to the receiver. A virtual smart card is counted as an active smart card.
- If the smart card service on RHEL 7 does not start correctly, you might need to modify the pcsd startup script located at `/usr/lib/systemd/system/pcsd.service`. Open the script for editing and change the ExecStart option to the following:

```
ExecStart=/usr/sbin/pcsd --foreground --auto-exit -c /etc/  
reader.conf.d/hpremotescr.conf
```

Mouse Cursor issues on servers and blades (Windows Sender)


VMouseSetup.exe must be installed on systems without a physical pointer device (for example, servers or blade workstations) on Windows 8 and later. VMouseSetup.exe will install a Virtual Pointer Driver to enable HP ZCentral Remote Boost to correctly display the mouse cursor on systems without a pointer device. VMouseSetup.exe is included in the HP ZCentral Remote Boost Install package for the Windows Sender.

A Switching between HP ZCentral Remote Boost and Remote Desktop Connection (Windows only)

You can switch between an HP ZCentral Remote Boost session and a Windows Remote Desktop Connection session without having to log out of the remote desktop on the sender as long as you use the same credentials for both sessions. The existing session is ended when you start the new session using the other program.

If you try to use *different* credentials to start a Remote Desktop Connection session with a sender that is already in an HP ZCentral Remote Boost session, Remote Desktop Connection allows you to force a logoff for the remote user account currently in the HP ZCentral Remote Boost session. Forcing a log off requires Windows administrator privileges and ends the HP ZCentral Remote Boost session.

If you try to use *different* credentials to start an HP ZCentral Remote Boost session with a sender that is already in a Remote Desktop Connection session, HP ZCentral Remote Boost displays an authorization failure message. You cannot force a logoff in this scenario.

 **IMPORTANT:** See the following information about security and authentication concerns:

- If you switch from an active Remote Desktop Connection session to an HP ZCentral Remote Boost session, the remote desktop might enter into a logged on and unlocked state. You might want to avoid this if an unlocked remote desktop is a security concern. To avoid this, log off of the remote desktop using Remote Desktop Connection before starting the HP ZCentral Remote Boost session.
 - If you have an active Remote Desktop Connection session that you authenticated using a smart card and try to switch to an HP ZCentral Remote Boost session using Easy Login on a receiver other than the one that started the active Remote Desktop Connection session, HP ZCentral Remote Boost prompts you for your user name and password, which is not normally required for Easy Login authentication. If you do not know your user name and password because you normally use smart card authentication, you cannot switch to an HP ZCentral Remote Boost session. In this scenario, the Remote Desktop Connection session must be ended manually to release the smart card reader for use by HP ZCentral Remote Boost.
-

B Creating an agent for remote application termination (Windows only)

When an HP ZCentral Remote Boost session is unintentionally ended, you might want applications on the sender to be terminated to prevent them from operating unsupervised.

This appendix describes how to create an agent on the sender that provides remote application termination by monitoring events in the HP ZCentral Remote Boost Sender event log `HPRemote`.

Viewing the HPRemote log

To view the HPRemote log:

1. Select **Start**, select **Control Panel**, select **Administrative Tools**, and then select **Computer Management**.
2. In the left pane, select **System Tools**, select **Event Viewer**, and then select **HPRemote**.

The HPRemote log contains information about recent HP ZCentral Remote Boost connection activity. By default, the most recent events are listed first.

To view the properties of an event, double-click it to open the Event Properties window.



NOTE: For additional information about Windows event logging, go to Microsoft® Developer Network (MSDN) at <http://msdn.microsoft.com/>.

HPRemote log format

Data in the HPRemote log consists of a message ID followed by optional data in both string and binary formats.

The following table describes the events logged in the HPRemote log. The message IDs are defined in the header file `RgsenderEvents.h` and are 32 bit values. The `EventID` is from the `Code` field within the message ID and, for the HPRemote log, ranges from 1 to 13.

Table B-1 Log message IDs and their descriptions

Message ID	Description
<code>RGSENDER_CONNECT_STATE</code> Event ID: 3	<p>The connection state consists of zero or more primary connections and zero or more non-primary connections. Each event entry records the current number of active connections in each category. Events appear when the connection status of these of a particular connection changes.</p> <p>The first field represents the number of primary connections. The second field represents the number of non-primary connections. Each state field provides a string and a 32-bit unsigned integer.</p> <p>Event viewer message:</p> <p>Primary connections: %1. Non-primary connections: %2.</p> <p>Strings:</p>

Table B-1 Log message IDs and their descriptions (continued)

Message ID	Description
	<p>%1 = number of primary connections</p> <p>%2 = number of non-primary connections</p> <p>Data:</p> <p>UINT32 numPrimary</p> <p>UINT32 numNonprimary</p> <p>Event viewer example:</p> <p>Primary connections: 1. Non-primary connections: 0.</p>
RGSENDER_CONNECT Event ID: 4	<p>A new connection was established with an associated name. If Easy Login is enabled, the name assignment will be deferred until login, and the associated name may be Anonymous.</p> <p>Event viewer message:</p> <p>Connect %1.</p> <p>Strings:</p> <p>%1 = name associated with connection</p> <p>%2 = IP address and port number of receiver</p> <p>Data:</p> <p>None</p> <p>Event viewer example:</p> <p>Connect MYDOMAIN\myusername.</p>
RGSENDER_DISCONNECT Event ID: 5	<p>A receiver has disconnected. The message will contain the name associated with the connection. If Easy Login is enabled and the receiver disconnects before a login, the associated name may be Anonymous.</p> <p>Event viewer message:</p> <p>Disconnect %1.</p> <p>Strings:</p> <p>%1 = name associated with connection</p> <p>%2 = IP address and port number of receiver</p> <p>Data:</p> <p>None</p> <p>Event viewer example:</p> <p>Disconnect MYDOMAIN\myusername.</p>
RGSENDER_STARTUP Event ID: 1	<p>Reference event registered to aid in interpretation of the event log by Event Viewer. Signifies proper startup of the HP ZCentral Remote Boost Sender service.</p> <p>Event viewer message:</p>

Table B-1 Log message IDs and their descriptions (continued)

Message ID	Description
	<p>HP ZCentral Remote Boost Sender startup.</p> <p>Strings:</p> <p>None</p> <p>Data:</p> <p>None</p>
<p>RGSENDER_SHUTDOWN</p> <p>Event ID: 2</p>	<p>Reference event registered to aid in interpretation of the event log by Event Viewer. Signifies proper shutdown of the HP ZCentral Remote Boost Sender service.</p> <p>Event viewer message:</p> <p>HP ZCentral Remote Boost Sender shutdown.</p> <p>Strings:</p> <p>None</p> <p>Data:</p> <p>None</p>
<p>RGSENDER_SET_PRIMARY</p> <p>Event ID: 6</p>	<p>A connection with an associated name is set as the primary connection.</p> <p>Event viewer message:</p> <p>Set %1 as primary connection.</p> <p>Strings:</p> <p>%1 = name associated with connection</p> <p>Data:</p> <p>None</p> <p>Event viewer example:</p> <p>Set MYDOMAIN\myusername as primary connection.</p>
<p>RGSENDER_SET_NONPRIMARY</p> <p>Event ID: 7</p>	<p>A connection with an associated name is assigned to a non-primary status. This may happen as a result of a logout.</p> <p>Event viewer message:</p> <p>Set %1 as non-primary connection.</p> <p>Strings:</p> <p>%1 = name associated with connection</p> <p>Data:</p> <p>None</p> <p>Event viewer example:</p> <p>Set MYDOMAIN\myusername as non-primary connection.</p>
<p>RGSENDER_ASSIGN_USER</p>	<p>If Easy Login is enabled, the assignment of the name will be deferred until login. When the name is assigned, this message will be generated.</p>

Table B-1 Log message IDs and their descriptions (continued)

Message ID	Description
Event ID: 8	<p>Event viewer message:</p> <p>Assign %1 connection to %2.</p> <p>Strings:</p> <p>%1 = original name of connection</p> <p>%2 = new name of connection</p> <p>Data:</p> <p>None</p> <p>Event viewer example:</p> <p>Assign Anonymous connection to MYDOMAIN\myusername.</p>
RGSENDER_USB_CONNECT_DEVICE	Remote USB mounted a USB device to the sender.
Event ID: 9	<p>Event viewer message:</p> <p>USB Device Connect:Class=%1, Vendor ID=%2, Product ID=%3, Manufacturer=%4, Product=%5</p> <p>Strings:</p> <p>%1 = USB device class</p> <p>%2 = USB device vendor ID</p> <p>%3 = USB device product ID</p> <p>%4 = USB device manufacturer string</p> <p>%5 = USB device product string</p> <p>Data:</p> <p>None</p>
RGSENDER_USB_DISCONNECT_DEVICE	Remote USB unmounted a USB device from the sender.
Event ID: 10	<p>Event viewer message:</p> <p>USB Device Connect:Class=%1, Vendor ID=%2, Product ID=%3, Manufacturer=%4, Product=%5</p> <p>Strings:</p> <p>%1 = USB device class</p> <p>%2 = USB device vendor ID</p> <p>%3 = USB device product ID</p> <p>%4 = USB device manufacturer string</p> <p>%5 = USB device product string</p> <p>Data:</p> <p>None</p>

Table B-1 Log message IDs and their descriptions (continued)

Message ID	Description
RGSENDER_CONNECT_USB_DENIED	A USB device connection was denied by the USB access control list.
Event ID: 13	Event viewer message: USB Device Connect:Class=%1, Vendor ID=%2, Product ID=%3, Strings: %1 = USB device class %2 = USB device vendor ID %3 = USB device product ID Data: None

Agent design guidelines

Designing an agent to provide Remote Application Termination requires consideration of a number of issues in order to minimize data loss and determine when a last-resort shutdown of a disconnected desktop session is required. Listed in the following sections are several topics to consider when designing application control agents for your environment. The topics are not exhaustive—use them as a starting point for a more complete design that meets your business requirements.

Desktop session logout

In some circumstances, loss of a primary user connection should trigger a full shutdown of all applications and force a logout of the desktop session (perhaps after a specified time limit for reconnection has expired). This action would drop all connections to the remote session.

- **Benefit:** Implementing a full desktop session shut down/logout ensures that all connection activity ceases immediately and ensures that applications are prevented from further unattended actions. Shut down of a remote session frees the workstation for connection by other users. This approach is the most absolute and secure solution for desktop session management. The agent relies upon Windows logout routines to terminate environment.
- **Issue:** Forcing a desktop session shutdown or logout can result in data loss for any open applications on the desktop session. Forcing session logouts can result in application alert prompts requiring user interaction to save altered data. These prompts can delay or halt an interactive logout. Session termination also destroys memory of window placement on the desktop and requires user intervention at restart.

Selective environment shutdown

Partial shutdown of an environment terminates only specific applications. It does not implement a full desktop session logout. It selectively protects only the most critical applications requiring oversight and control.

- **Benefit:** Preserves the active desktop session for connection at a later time. Selectively terminates the applications of interest. Preserves data not governed by an automated shutdown policy. Supports session recovery with an arbitrary connection time. If done in layers (giving some applications more time than others), then a gradual "soft landing" shutdown can occur that ultimately results in a full logout. Idle resources over a specific amount of time can be returned to a remote server pool.
- **Issue:** Potentially more complicated to implement. Can require coordination of multiple agents to handle layered shutdown. May still result in data loss for specific applications. May also require a primary semaphore to halt or terminate multiple agents if the user reconnects and wants to stop the shutdown process.

Wrapping applications of interest

You can launch agents that supervise only specific applications in a given environment. Tying agents to specific applications is a selective safety net for every user.

- **Benefit:** Application-specific agents can be implemented as plug-ins or support utilities for an application. In the future, certain software providers may provide custom interfaces for safe shutdown messages from an agent or the operating system. Custom agents can be independently maintained and tied to specific application releases for greater support flexibility. Independent agent design supports unit testing and decouples environmental dependencies.
- **Issue:** Users need specific recourse to disarm an agent if they reconnect. Applications may not interact well with a dedicated agent (and only shut down due to a global shutdown request). Dedicated agents could possibly be compromised.

Administrator alerts

Instead of shutting down an environment, you can design an agent to alert an administrator or operator to determine the status of the user before taking action. This watchdog approach can further be defined to exploit redundant network connection support to a remote system to allow user-directed shutdowns to occur.

- **Benefit:** System agents are not required to take destructive action—they serve only as alarms and monitors for alternative human intervention.
- **Issue:** May require redundant networking channel. Requires administrator or operator availability to support.

Anticipating user disconnects and reconnects

Users must first be warned about the consequences of disconnection. Agents that provide protection for a disconnected session may become a nuisance for unsuspecting users if they fail to address protective measures in place for their safety. For example, users must know how much time they have to reconnect before safeguards take action. If a remote agent arms itself for application termination, users should be presented with a large, unmistakable disarming "opt-out" panel that, upon login and discovery, they can halt any agent actions before termination. Organizations should carefully discuss and publicize safety measures due to potential data loss.

- **Issue:** Users should not be able to disable or specify their own timeouts due to potential irreversible data loss.

General agent design guidelines

In developing an agent, HP recommends following these guidelines:

- The agent should externally log its decisions and actions for postmortem analysis.
- Independent agents should provide their own opt-out, disarming dialogs with countdown feedback before taking action.
- Where possible, limit your actions to those areas you are certain of the outcomes to minimize loss of data and productivity.
- Inspect error codes when reading event logs. The reliability of this HP ZCentral Remote Boost communication method depends upon the Windows Event Log system. HP recommends using all information available to its fullest potential.

Recovery settings for the HP ZCentral Remote Boost Sender service

This section discusses restart options for HP ZCentral Remote Boost Sender and possible interactions of the agent with the sender.

By default, most Windows services are installed without any automatic restart or recovery settings. The same is true for the HP ZCentral Remote Boost Sender service.

Restarting the HP ZCentral Remote Boost Sender service can help reconnect a lost HP ZCentral Remote Boost connection (unless a system error prevents the HP ZCentral Remote Boost Sender service from restarting).

When designing the agent, you should consider whether to check for the existence of a running HP ZCentral Remote Boost Sender service as an indication of a sufficient primary user connection. If service restarts are programmed for your environment, this test may be unnecessary.

To set the HP ZCentral Remote Boost Sender service to restart automatically, you must change its recovery settings on the **Recovery** panel of its properties (right-click the service and select **Properties**).

Actions to take for the first failure, second failure, and subsequent failures are available in the properties menu. The Recovery options include:

- Take No Action
- Restart the Service
- Run a Program
- Restart the Computer

Sample agent

The following sample Windows agent monitors the HPRemote event log and interprets its events. Comments are included in the agent code showing where additional code would be added to determine if the number of primary users has dropped to zero. If so, further code can be added to terminate applications on the sender.

The sample code is a fixed-polling Windows agent that reads and interprets the HPRemote event log. The agent uses two functions:

1. `processEvent(eventServer, eventSource, dwEventNum)`
 - open event log, read event `dwEventNum`, close event log
 - if a valid read, process recognized `EventIDs`, then return
2. `monitorEvents(eventServer, eventSource, seconds)`

- for a finite number of seconds (or infinite if seconds <= 0) do
- open event log, read log length, close event log
- if log has changed, processEvent(), else sleep for X ms.

To properly use the function `monitorEvents(...)`, the following strings must be defined in the function call:

- LPCTSTR eventServer: if string is defined as "\\yourservername", then the log is stored on a remote server - if the string is empty (NULL), then the log is stored locally (note that four backslashes compiles to two in a string constant)
- LPCTSTR eventSource: the name of the target event generator, for example, rgreceiver

The sample agent uses Microsoft event logging functions such as `OpenEventLog`, `ReadEventLog`, and `CloseEventLog`.

The sample agent is listed here. Where noted, add user-specific code. The agent header file, `RGSenderEvents.h`, is installed in the HP ZCentral Remote Boost Sender installation directory under the following path:

```
\include\RGSenderEvents.h

#include <windows.h>
#include <stdio.h>
#include "RGSenderEvents.h"

#define BUFFER_SIZE 1024 // safe EVENTLOGRECORD size for now
#define EVENT_SERVER NULL // remote server = "\\nodename"; local = NULL
#define EVENT_SRC "rgsender" // specifies specific event name source in //
HPRemote

BOOL processEvent(LPCTSTR eventServer, LPCTSTR eventSource, DWORD
dwEventNum)

{
HANDLE h;

EVENTLOGRECORD *pevlr;

BYTE pBuffer[BUFFER_SIZE];

DWORD dwRead, dwNeeded;

BOOL result;

// Open, read, close event log =====

if ((h = OpenEventLog(eventServer, eventSource)) == NULL)
{
... report error status ...

```

```

return true;

}

// Set the pointer to our buffer. Strings and data will get appended to the
EVENTLOGRECORD structure.

pevlr = (EVENTLOGRECORD *) &bBuffer

// Read the event specified by dwEventNum

result = ReadEventLog(h, // event log handle
EVENTLOG_SEEK_READ | // start at specific event
EVENTLOG_FORWARDS_READ, // advance forward
dwEventNum, // record to read
pevlr, // pointer to buffer
BUFFER_SIZE, // size of buffer
&dwRead, // number of bytes read
&dwNeeded); // bytes in next record
if (CloseEventLog(h) == false)
{
... report error status ...
return true;
}

// Process event (example: print out event) =====
if (result)
{
// We only know how to process specific events
if (pevlr->EventID == RGSENDER_CONNECT_STATE)
{
// Retrieve the two UINT32 fields of this message
// representing primary and non-primary connections.

unsigned int *pData = (unsigned int *)
(LPBYTE) pevlr + pevlr->DataOffset);
// Examine state of primary connections here for other
// agent response if number drops to zero...

```

```

... example only prints out retrieved record to console ...
printf ("Event: %u Primary: %u Secondary: %u\n",
dwEventNum, pData[0], pData[1]);
}
... Process other events here if desired ...
}
else
{
... report unrecognized event here ...
return true;
}
return false;
}

void monitorEvents(LPCTSTR eventServer, LPCTSTR eventSource, int seconds)
{
DWORD dwCurrentIndex = 0;
DWORD dwCurrentStart;
DWORD dwCurrentCount;
DWORD dwNewIndex;
int waitedFor;

// This function will monitor the log for the specified number of
// seconds. If seconds is less than zero, we will wait forever.
for (waitedFor = 0; seconds < 0 || waitedFor < seconds; )
{
HANDLE h;

// Open, read status of log, close event log =====
if ((h = OpenEventLog(eventServer, eventSource)) == NULL)
{
... report error status here ...
return;
}
}

```

```

// If an event is added, either the start or count will change.
// Get the start and count. Microsoft does not specify what
// reasons these functions could fail, so we cannot ensure
// success. Check the return value.
if (GetOldestEventLogRecord(h, &dwCurrentStart) == false ||
GetNumberOfEventLogRecords(h, &dwCurrentCount) == false)
{
CloseEventLog(h);
... report error - unable to obtain event logs ...
return;
}
if (CloseEventLog(h) == false)
{
... report error status here ...
return;
}
// Determine state of log change =====
// Compute the index of the last event. If the count is zero, then
// there are no events and the index is 0.
if (dwCurrentCount == 0)
{
dwNewIndex = 0;
}
else
{
dwNewIndex = dwCurrentStart + dwCurrentCount - 1;
}
// If the new index is different than the current, update the current
// and process the current event. Otherwise, we sleep for a while.
if (dwNewIndex != dwCurrentIndex)
{

```

```

// We have at least one new event. Print out the last event.
dwCurrentIndex = dwNewIndex;
if (dwNewIndex)
{
if (processEvent(eventServer, eventSource, dwCurrentIndex))
{
... event processing error here ...
return;
}
}
else
{
// No new events. Sleep for 1 second.
Sleep(1000);
waitedFor += 1;
}
return;
}
main( ... )
{
... setup and initialize agent ...
monitorEvents(EVENT_SERVER, EVENT_SRC, seconds);
... cleanup agent here or send alerts ...
... may wish to return status from monitorEvents ...
}

```


C Uninstalling HP ZCentral Remote Boost

To uninstall HP ZCentral Remote Boost, follow the procedure for your operating system.

Uninstalling HP ZCentral Remote Boost Receiver or HP ZCentral Remote Boost Sender (Windows)

To uninstall HP ZCentral Remote Boost Receiver or HP ZCentral Remote Boost Sender from Windows:

- ▲ Open the **Programs and Features** item in Control Panel, and uninstall the entry corresponding to HP ZCentral Remote Boost Receiver or HP ZCentral Remote Boost Sender (**Remote Graphics Receiver** or **Remote Graphics Sender**).

 **TIP:** You can alternatively perform each uninstallation using the command-line option `/autoremove` for each installer. Use the `/removesettings` option when uninstalling to delete user settings.

Uninstalling HP ZCentral Remote Boost Receiver (Linux)

Use the procedure for your version of Linux.

Red Hat Enterprise Linux

To uninstall HP ZCentral Remote Boost Receiver on Red Hat® Enterprise Linux:

1. Log in as root.
2. Execute the following command to uninstall the HP ZCentral Remote Boost Receiver:

```
rpm -e --allmatches rgreceiver
```

Ubuntu

To uninstall HP ZCentral Remote Boost Receiver from Ubuntu:

1. Log in as root.
2. Execute the following command to uninstall the HP ZCentral Remote Boost Receiver:

```
dpkg -P rgreceiver
```

HP ThinPro

To uninstall HP ZCentral Remote Boost Receiver on HP ThinPro:


1. Log in as root.
2. Execute the following commands:

```
fsunlock
```

```
dpkg -l | grep -i rgs-
```

```
dpkg -l | grep -i remoteboost-
```


The HP ZCentral Remote Boost Receiver core package and dependency packages are listed.

 **NOTE:** A package named findutils might also be listed because of the letters "rgs" appearing in the package description. Do not remove this package.

Beginning with ThinPro 7.0, the hptc-rgs-usb package is installed by default with the OS. Do not remove this package.

3. Execute the following command to remove the listed packages:

```
dpkg -P <package name> [<package name> ...]
```

 **IMPORTANT:** When entering package names, omit the brackets and braces. For syntax help, see [User input syntax key on page iii](#).

4. Execute the following command:

```
ln -snf ../tmp/tmpfs/var/opt /var/opt
```

5. Restart the thin client.

Uninstalling HP ZCentral Remote Boost Sender (Linux)

Use the procedure for your version of Linux.

Red Hat Enterprise Linux

To uninstall the HP ZCentral Remote Boost Sender from Red Hat Enterprise Linux:

1. Log in as root.
2. Execute the following command to remove the HP ZCentral Remote Boost Sender:

```
rpm -e --allmatches rgsender
```

3. If the smart card redirection package was installed, execute the following command:

```
rpm -e --allmatches rgsender-smartcard
```

Ubuntu

To uninstall HP ZCentral Remote Boost Sender from Ubuntu:

1. Log in as root.
2. Execute the following command to remove the HP ZCentral Remote Boost Sender:

```
dpkg -P rgsender
```

3. If the smart card redirection package was installed, execute the following command:

```
dpkg -P rgsender-smartcard
```


Uninstalling HP ZCentral Remote Boost Receiver (macOS)

To uninstall HP ZCentral Remote Boost Receiver from macOS:

1. Log in as an administrator (or be able to provide administrator credentials).
2. Open a Finder window, and then select **Applications**.
3. Drag the **HP ZCentral Remote Boost Receiver** icon to the trash bin.
4. (Optional) To remove all traces of HP ZCentral Remote Boost Receiver after uninstalling it, navigate to **/Library/Application Support/HP/rgreceiver/uninstall.command**, double-click **uninstall.command**, and then follow the on-screen instructions.

Index

A

- Advanced Linux Sound Architecture (Linux only)
 - See Remote Audio
- Advanced Video Compression 47
- ALSA (Linux only)
 - See Remote Audio
- audio
 - See Remote Audio
- audio settings
 - See HP ZCentral Remote Boost Receiver settings
- authentication 47, 48
- auto-launch properties 76, 95, 100
- Automation API
 - restriction control 95

C

- certificate
 - custom 33
 - signed by a CA, receiver 33
 - signed by a CA, sender 33
- collaboration 47, 50
 - invitations 52
- command-line options
 - HP ZCentral Remote Boost Receiver 16, 27
 - HP ZCentral Remote Boost Sender (Linux) 29, 30
 - HP ZCentral Remote Boost Sender (Windows) 29
- connection settings
 - See HP ZCentral Remote Boost Receiver settings

D

- Directory Mode 47, 73
- display layout matching 47, 52, 53
- display resolution matching 47, 52, 53

E

- Easy Login 47-49
- event logging, HP ZCentral Remote Boost Sender (Windows only) 29, 31

F

- features, overview 1, 2
- features, using 47

G

- Game Mode (Windows only) 47, 61, 64
- gesture settings
 - See HP ZCentral Remote Boost Receiver settings
- gestures, list of 47, 61, 63

H

- hotkey settings
 - See HP ZCentral Remote Boost Receiver settings
- HP Velocity 47, 48
- HP ZCentral Remote Boost Advanced Features
 - Advanced Video Compression 47
 - HP Velocity 47, 48
- HP ZCentral Remote Boost Receiver
 - auto-launch properties 76, 95, 100
 - command-line options 16, 27
 - GUI (macOS) 16, 17
 - GUI (Windows/Linux) 16
 - installing (Linux) 7
 - installing (macOS) 7, 15
 - installing (Windows) 7
 - interoperability with different HP ZCentral Remote Boost versions 1, 3
 - opening 16
 - overview 16
 - Setup Mode 16, 22
 - starting an HP ZCentral Remote Boost session 16
 - starting in Directory Mode 47, 73
 - toolbar (macOS) 16, 20
 - toolbar (Windows/Linux) 16, 18, 19
 - window (macOS) 16, 20
 - window (Windows/Linux) 16, 18

- HP ZCentral Remote Boost Receiver settings
 - audio 16, 23, 25
 - connection 16, 23
 - gesture (Windows only) 16, 23, 24
 - hotkey 16, 23, 26
 - logging 16, 23, 27
 - network 16, 23, 25
 - performance 16, 23, 24
 - statistics (Windows/Linux only) 16, 23, 27
- HP ZCentral Remote Boost Sender
 - command-line options (Linux) 29, 30
 - command-line options (Windows) 29
 - event logging 29, 31
 - installing (Linux) 7
 - installing (Windows) 7, 10
 - interoperability with different HP ZCentral Remote Boost versions 1, 3
 - network interface binding 103, 104
 - notification icon (Windows only) 29, 31
 - overview (Linux) 29
 - overview (Windows) 29
 - remote application termination (Windows only) 114
- HPRemote log
 - format 114
- HPRemote log (Windows only)
 - viewing 114

I

- installation
 - HP ZCentral Remote Boost Receiver (Linux) 7
 - HP ZCentral Remote Boost Receiver (macOS) 7, 15
 - HP ZCentral Remote Boost Receiver (Windows) 7
 - HP ZCentral Remote Boost Sender (Linux) 7
 - HP ZCentral Remote Boost Sender (Windows) 7, 10

K

keyboard layouts, supported 47, 61, 64

L

licensing, HP ZCentral Remote Boost Sender 1, 4

logging

HP ZCentral Remote Boost

Receiver

See HP ZCentral Remote Boost

Receiver settings

M

microphones

See Remote USB

multi-monitor overview 47, 52, 53

N

network interface binding, HP

ZCentral Remote Boost

Sender 103, 104

network settings

See HP ZCentral Remote Boost

Receiver settings

NVIDIA resolution-matching 47, 52, 53, 55

O

overview 1

P

performance settings

See HP ZCentral Remote Boost

Receiver settings

properties

making immutable 95

setting in a configuration

file 76, 93, 94

setting on the command

line 76, 93, 94

syntax 76, 93, 94

PulseAudio (Linux only)

See Remote Audio

R

remote application termination (Windows only) 114

Remote Audio

ALSA (Linux only) 47, 65, 66

overview 47, 65

PulseAudio (Linux only) 47, 65, 66

troubleshooting 103, 109

using (Linux-based sender) 47, 65, 66

using (Windows-based

sender) 47, 65, 66

virtual audio device

(Windows) 47, 65, 66

Remote Clipboard

overview 47, 69

Remote Desktop Connection 113

Remote USB (Windows/ThinPro only)

Access Control List 47, 69, 71

enabling on HP ThinPro 47, 69

microphones 47, 69, 70

overview 47, 69

remoting behavior 47, 69

support 47, 69

troubleshooting 103, 111

S

screen blanking, sender 47, 52, 61

settings, HP ZCentral Remote Boost

Receiver

See HP ZCentral Remote Boost

Receiver settings

Setup Mode, HP ZCentral Remote

Boost Receiver 16, 22

Single Sign-on 47-49

smart card redirection

troubleshooting 103, 112

using 47-49

software, compatibility with HP

ZCentral Remote Boost 1, 4

standard authentication 47, 48

statistics settings (Windows/Linux only)

See HP ZCentral Remote Boost

Receiver settings

T

touch features 47, 61, 63

troubleshooting 103

failed connection attempts 103

graphical issues (Linux) 103, 107

network timeouts 103, 106

Remote Audio 103, 109

Remote USB (Windows/ThinPro only) 103, 111

smart card redirection 103, 112

U

USB

See Remote USB

V

virtual keyboard 47, 61, 63

virtual mouse 47, 61, 63

W

Wacom solution 47, 61, 62