Z /hp

CONFIGURATION GUIDE

CONTENTS & NAVIGATION

HP ZCENTRAL REMOTE BOOST 2020

OVERVIEW

In an HP ZCentral or any remote computing environment, HP ZCentral Remote Boost[1] enables the connectivity between the user and the remote computing host. Your programs run natively on the remote workstation and take full advantage of its computing and 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 Remote Boost protocol is designed to operate at speeds of up-to 30-60 high resolution image updates per second. This varies based on workflow, network, and system factors.

The Remote Boost receiver will optimize the user viewing experience by unpacking and displaying screen images in a color correct manner supporting one or more 4K displays and a variety of screen layouts. The user has control of image and audio quality, window modes, and DPI scaling. Precision mouse, stylus, and pointer movement is optimized in Remote Boost such that detailed tooltips, crosshairs, highlights, and other UI hints found frequently in professional applications appear as normal.

The Remote Boost sender is optimized to transmit high quality screen images to the receiver in a secure "pixels only" manner. The Remote Boost sender will optimize the content and frequency of screen updates to provide best image quality all while limiting the compute and network requirements.

This document provides guidance on network bandwidth consumption based on different workflows. In addition, this document lists Remote Boost properties that can be adjusted based on site-specific network connectivity limitations and visual workflow requirements.
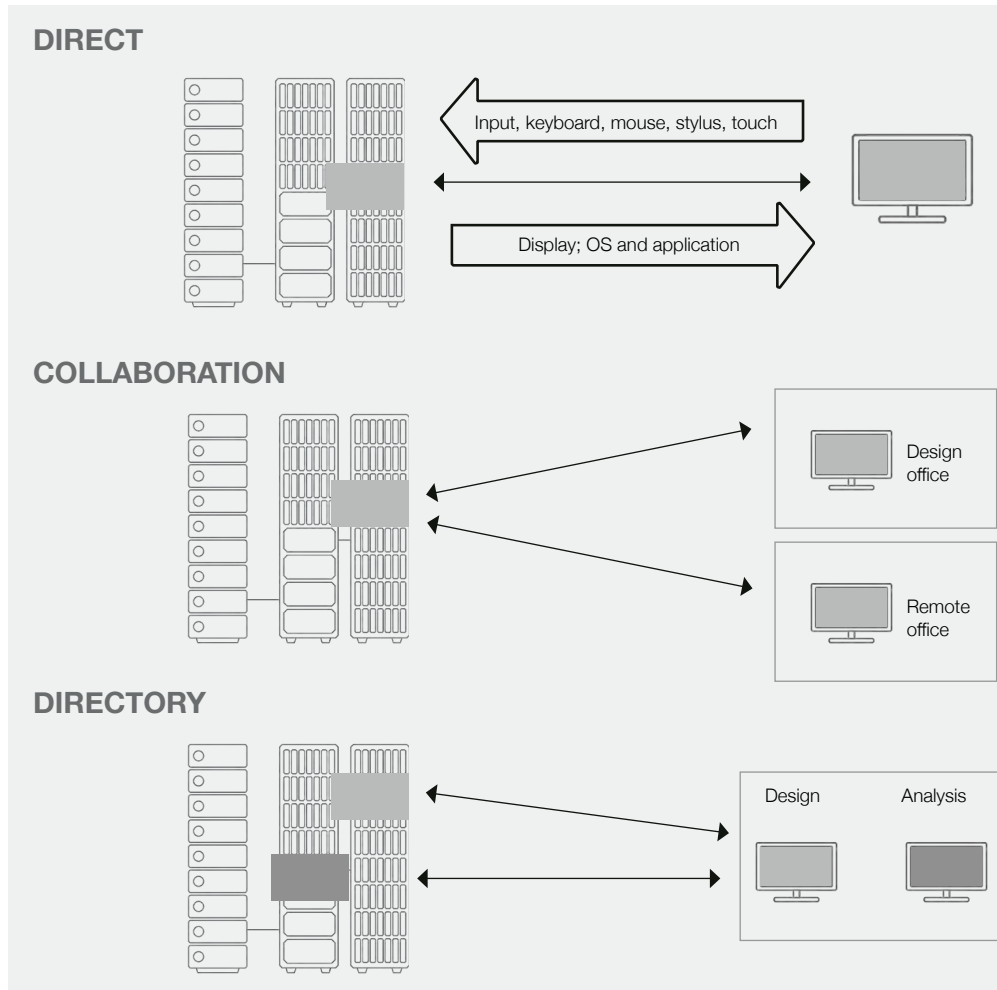
MODES OF OPERATION:

HP ZCentral Remote Boost is designed to provide three high-level modes of operation. The image below depicts the three modes. The image represents the remote computing hosts on the left which are running the HP ZCentral Remote Boost Sender and the client devices on right side running the HP ZCentral Remote Boost Receiver.

In Direct mode the user has full control of the remote desktop. Once connection is established and user authenticated, the user workflow runs on the remote desktop but feels like local.

In Collaboration mode the primary user has full control of the remote desktop. Secondary users are granted access manually by the primary user or the Sender can be configured to automatically accept secondary user login requests. The secondary users can run in Observation mode, unable to control mouse or input, or the primary receiver can allow pointer and keyboard input from the secondary user.

In Directory mode, the user has control of multiple remote desktops. This mode works well in situations where each host has specific applications and/or hardware configurations required for different tasks. 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 usernames and computer names. HP ZCentral Remote Boost Receiver reads this file and attempts to connect to each specified sender automatically. See the HP ZCentral Remote Boost User Guide for additional details on format and functionality. This method offers an alternative to brokered sessions when the intent is having the users connect to specific remote hosts.

DIRECT

Input, keyboard, mouse, stylus, touch

Display; OS and application

COLLABORATION

Design office

Remote office

DIRECTORY

Design   Analysis

ESTIMATING RESOURCE REQUIREMENTS

The Remote Boost compute and network bandwidth consumption are primarily influenced by four main factors:

- Image update rate
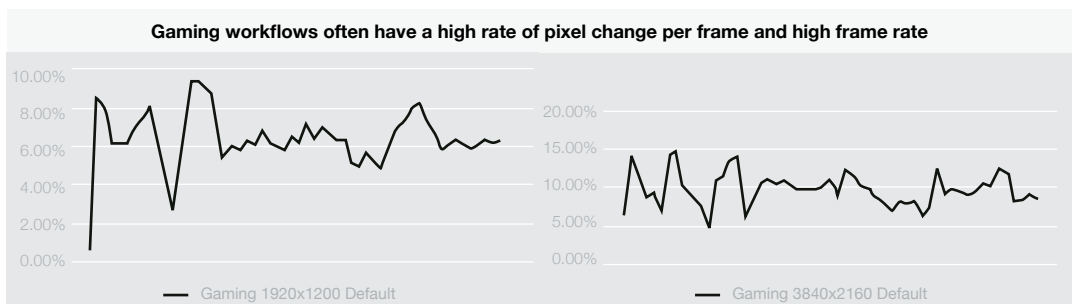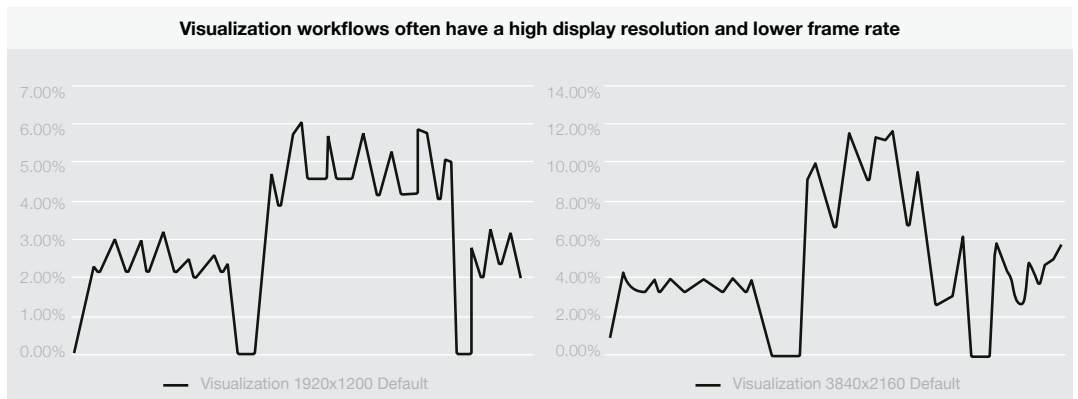- Pixel changes per frame
- Image quality level
- Image codec

The Remote Boost default settings for Image Quality, Image Update rate, and codec settings are optimum for most use cases. These values are the primary adjustments that will impact the computing and network bandwidth required by Remote Boost Sender and Receiver.

Bandwidth Consumption: The best experience requires 1Gbps to the endpoint with the expectation that 0-15% of the available bandwidth can be in use during spikes or longer duration based on the desired image quality, frequency and amount of visual changes in the user workflow. Estimating network bandwidth consumption consists of average number of pixels changing per frame, average frame change rate, and compression result. Planning for the best experience is not an easy task.

Latency: The best experience requires low latency, less than 50ms, between the receiver and sender. Endpoints from Wi-Fi® and WAN connections benefit from HP Velocity which improves connectivity during periods of congestion and network loss. Low latency provides the best experience for interactivity, precise mouse and pointer movements, and responsive user interfaces.

WORKFLOW EXAMPLES

An example of HP Remote Boost network bandwidth consumption over a 60 second elapsed time using a 1Gbps ethernet connection is shown below while running three example workflows using default settings. These examples are meant to show a steady state of activity on the remote desktop. It will be normal for real world experiences to include spikes and longer duration periods of higher bandwidth consumption. Workflows also frequently include "think time" where little or no visual changes occur.

Visualization workflows often have a high display resolution and lower frame rate

Visualization 1920x1200 Default

Visualization 3840x2160 Default

Gaming workflows often have a high rate of pixel change per frame and high frame rate

Gaming 1920x1200 Default

Gaming 3840x2160 Default

Video playback workflows often have a high rate of pixel changes per frame and steady frame rate

Video 1920x1200 Default   Video 3840x2160 Default
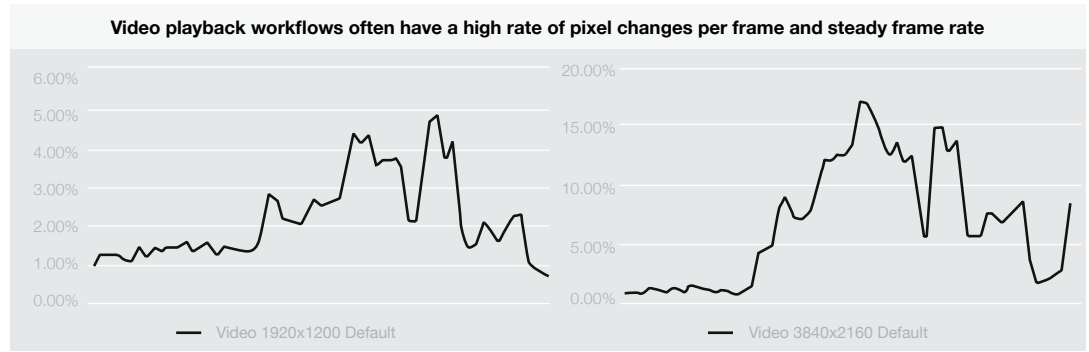
CONFIGURATION APPS

Users are encouraged to accept the default settings as they work well across a wide range of workflows.

In the case where certain site-specific changes need to be made, there are tools and configuration files with properties that alter Remote Boost behavior.

The Receiver and Sender each have properties that alter the default behavior. Some properties alter either just the sender and receiver, others alter the interaction between sender and receiver, and others alter the network bandwidth consumption.

Some of the more common adjustments are discussed below. See the HP Remote Boost 2020 User Guide, help menus associated with the sender and receiver configuration utilities and the comments associated with each parameter in the configuration files for more details.

Receiver	Sender
The HP ZCentral Remote Boost Receiver Configuration Utility (menu below) is the recommended method to change settings. C:\Program Files\HP\Remote Graphics Sender\ReceiverConfigApp.exe	The HP ZCentral Remote Boost Sender Configuration Utility (menu below) is the recommended method to change settings. C:\Program Files\HP\Remote Graphics Sender\SenderConfigApp.exe

Remote Boost Receiver Configuration	Remote Boost Sender Configuration
General	**General**
Image and Display	Authentication
Audio	Image and Display
Network	Network
HP Velocity	HP Velocity
USB	USB
Hotkeys	Collaboration
Logging	Logging
Activation	Diagnostics
	Certificate
Restore to default	**Restore to default**

| All properties are available in C:\Program Files\HP\Remote Graphics Receiver\rgreceiverconfig file. Manual changes to this file require a restart of the HP Remote Boost receiver and establish a new connection | All properties are available in C:\Program Files\HP\Remote Graphics Receiver\rgsenderconfig file. Manual changes to this file require a restart of the HP Remote Boost sender and establish a new connection |

SENDER CONFIGURATION

Increase the maximum image update rate

Set this when you want to exceed the default image update rate.

By default, both HP3 and AVC codec are capped at 30 image updates per second. In most workflows that is adequate. Set the Update Rate to 0, for workflows where updates need to occur at the fastest rate possible. Increasing the image update rate will often result in increased network bandwidth consumption.

Image and Display	**Image Update rate**
Network	This property sets the maximum number of image updates per second. With a setting of zero update rate will be unlimited.
HP Velocity	Maximum image update rate: − 0 +

Property	Value
Sets the maximum image update rate that the Sender transmits to the Receiver. If the value is set to zero, the update rate will be unlimited.	Rgsender.MaxImageUpdateRate=0

Enable headless display mode

Set this when the system is not configured with a physical local display.

By default, the Sender expects an EDID loaded based on the attached physical display(s). In many cases a local display is not necessary such as rack mount systems. This property enables the NVIDIA® graphics card driver to load an EDID. This feature is not supported on systems with AMD graphics cards.

Property	Value
Load an EDID on headless Windows system with NVIDIA® graphics. Once this property is enabled. This EDID will not be unloaded until the property is disabled.	Rgsender.Compatibility.Displays.ForceEdidOnHeadless=1

RECEIVER CONFIGURATION

Enable Adaptive Image Quality:

Set this when you want the best image quality but need to limit network bandwidth consumption.

When Adaptive image quality is enabled, Remote Boost gradually degrades 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).

The image quality slider sets the maximum image quality. HP ZCentral Remote Boost will attempt to maintain the image quality specified by this option. When adaptive image quality is selected, Remote Boost uses this option's setting as the maximum image quality to maintain but prioritizes updates over image quality.

Note: These options are disabled when Advanced Video Compression is enabled.

Remote Boost Receiver Configuration

| General |
| Image and Display |
| Audio |
| Network |
| HP Velocity |
| USB |

Experience
☑ Increase text renderig quality
☑ Enable image quality slider
Image Quality by default: (65)   0 ——————⬤—— 100

Adaptive image quality
When enabled, it will begin to degrade the image quality down to the minimum image quality setting anytime the updates-per-second value falls bellow the target update rate.

☑ Enable adaptive image quality by default
Minimum image quality: [−] 20 [+]
Target update rate: [−] 30 [+]

Enable Adaptive Image Quality. Maintain highest image update rate possible by allowing lower quality images.

Rgreceiver.Experience.Mode=AdjustImageQuality
Rgreceiver.Experience.MinImageQuality=20
Rgreceiver.Experience.MinUpdateRate=30

Optimize for video streaming.

Set this when the visual display contains little or no text. Such as streaming a full screen video.

In the Receiver UI Setting or ReceiverConfigApp, deselect "Increase text rendering quality" checkbox.

Remote Boost Receiver Configuration

| General |
| Image and Display |
| Audio |

Maximum numbers of cores: [Default ▾]

Experience
☐ Increase text rendering quality
☑ Enable image quality slider

Property	Value
Codec Quality Boost: The encoder analyzes the complexity of the image and increases the quality above the base quality setting in areas of high complexity. Disabling the quality boost can reduce both network bandwidth and CPU utilization at the expense of image quality.	Rgreceiver.ImageCodec.IsBoostEnabled=0

Optimize low bandwidth connections

Set this when Sender and Receiver connection has limited network bandwidth or high network latency. This option informs the Sender to encode based on the H.264 standard. A significant reduction in network bandwidth may occur. A side effect is potentially lower color and luminance quality on the receiver. When this option is set the Sender and Receiver maintain a constant but low bandwidth transmission even during times when no visual changes occur.

Remote Boost Receiver Configuration

| General |
| Image and Display |

Advanced Video Compression
☑ Enable Advanced Video Compression on Sender

Property	Value
Reduce network bandwidth using the H264 Codec H264 Codec	Rgreceiver.ImageCodec.IsH264Enabled=1

Increase Audio Sampling Rate

Use this setting to control the sampling rate of the remote audio.

Remote Boost Receiver Configuration

| General |
| Image and Display |
| **Audio** |
| Network |

Audio

√ Allow user to modify audio settings
√ Enable Remote Audio by default
√ Enable stereo audio by default

Audio Quality: **High (44 KHz CD Quality)** ∨

Property	Value
Set Remote Audio quality 0 11KHz (low) 1 22KHz (med default) 2 44KHz (high)	Rgreceiver.Audio.Quality=2

Best Practices

- Install the latest versions of Remote Boost Sender and Receiver
- Remote Boost Sender performs best with an NVIDIA® Quadro® graphics card
- Verify that the Sender display refresh rate is 60Hz
- Use at least 2 memory DIMMS on HP Z2 G4 and HP ZBook when running Remote Boost Receiver
- Set the system BIOS to Discrete only on Remote Boost Receiver systems with hybrid graphics

[1]HP ZCentral Remote Boost does not come preinstalled on Z Workstations but can be downloaded and run on all Z desktop and laptops without license purchase. With non-Z sender devices, purchase of perpetual individual license or perpetual floating license per simultaneously executing versions and purchase of ZCentral Remote Boost Software Support is required. RGS requires Windows, RHEL (7 or 8), UBUNTU 18.04 LTS, or HP ThinPro 7 operating systems. MacOS (10.13 or newer) operating system is only supported on the receiver side. Requires network access. The software is available for download at **hp.com/ZCentralRemoteBoost**.

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