

Unified Communications with HP Thin Clients



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Introduction

What is Unified Communications?

Unified Communications (UC) technology is a set of software tools that combine and integrate workplace communication and collaboration tools such as Voice over Internet Protocol (aka VoIP), web-based voice and video conferencing, traditional phone communications, desktop sharing, and instant messaging.

When combined with HP's industry leading hardware, UC's integration of the above tools delivers seamless user experiences that help people work together more effectively from anywhere, on any device.

Why is Unified Communications Important for Businesses & Organizations?

As businesses and organizations continue to expand their global presence, communication across multiple physical locations becomes increasingly relevant. To keep up with this changing communication environment, different communication, and collaboration technologies such as VOIP, video conferencing, voice mail, e-mail, instant messaging, and many more were developed to meet differing needs. This led to businesses and organizations managing multiple different platforms to meet their communication and collaboration requirements.

UC technology's purpose is to integrate each of the different communication and collaboration solutions that a business or organization's workforce use. Creating a seamless communication experience using UC technology enables businesses and organizations to communicate in the most efficient and effective manner possible.

Challenges of Unified Communications in a VDI or Cloud Environment

Using Unified Communications in a VDI or Cloud Infrastructure

Virtual Desktop Infrastructure (VDI) and Cloud Computing strategies make up the majority of the modern commercial network environments and will only continue to be the top choice for commercial computing. As these strategies move more and more computing experiences to VDI or the Cloud, the same, seamless UC experience that is offered by a PC using local computation is expected over the remote network.

Challenges with Unified Communications over VDI or the Cloud

The first challenge of UC in a VDI or Cloud environment is managing latency, i.e., the time difference between what is occurring in real-time and what the user is experiencing. Since VDI and Cloud computing add an extra layer of complexity compared to local processing, using UC with VDI or Cloud can increase the amount of latency, causing a noticeable delay between real-time and user-experienced communication.

The second challenge of UC in a VDI or Cloud environment is managing resource consumption, i.e., the amount of system resources, from either the local machine or the network, that any UC process may require. In a traditional VDI or Cloud environment the UC process takes up a certain number of resources. Relatively high UC usage can put a heavy burden on the network's overall resources and performance across the entire system may be impacted if not managed properly. An example of this is outlined below.

Example Scenario #1

Consider a small business with 50 employees with a simplified VDI infrastructure consisting of a single server that is configured to support all 50 users performing typical office tasks including email, web browsing and document, spreadsheet, and presentation creation. These productivity apps typically consume 0.5% of the available CPU resources on the host server, per user. When a user makes a video call to an outside vendor their call consumes an additional 2.0% of the available CPU resources of the host server.

In this example the total CPU utilization of the server's CPU is calculated by the below formula:

(Total # of logged in users * Average Server CPU utilization per User)

+(Additional CPU Utilization of UC call)

= Total Server CPU Utilization

(50 * 0.5%) + (2%) = 27%

In this scenario the extra CPU usage introduced is not an issue and there is no impact to the user, called party, or other users of the VDI implementation who are logged in performing their normal job duties.

Example Scenario #2

For this scenario, consider the same small business with all the same parameters as scenario 1, but now all 50 employees are to participate in an all-employee video conference call.

In this example the total CPU utilization of the server's CPU changes to the below formula:

$$\begin{aligned} & \text{(Total \# of logged in users * Average Server CPU utilization per User)} \\ & + \text{(Total \# of logged in users * Additional Server CPU Utilization of UC Call)} \\ & = \text{Total Server CPU Utilization} \\ & (50 * 0.5\%) + (50 * 2\%) = 125\% \end{aligned}$$

The total CPU utilization in this scenario is now 125%, 25% above the CPU's limit. As a result of the excess need for CPU processing consumption, the VDI environment in this scenario will begin to slow down and most likely become unusable for all users.

Solutions to Unified Communications Challenges

Optimization

In a typical VDI or Cloud use case the endpoint's processor does very little. All the heavy processing is performed by the server. Optimization is a UC management technique that offloads some or all the UC processing from the server to the endpoint. The server no longer must bear 100% of the load, and the idle endpoint processor is more efficiently utilized to deliver an optimal UC experience.

Local Redirection

Local redirection for UC typically includes the redirection of responsibility from the server to the endpoint for one or more of the following processes: Media redirection, USB redirection, and Media compression. Each of these methods of local redirection aid the UC process by offloading processing onto the endpoint device and relieving the server's CPU as well as the network bandwidth. The following provides an example of how the processing load can be managed using local redirection.

Example Scenario #3

The same small business attempting to hold an all-employee video conference call is now using UC optimizations to manage the load on their server, so instead of the server handling the processing for all 50 users attempting the video call, the 2% CPU resource utilization is offloaded to each user's endpoint.

In this example the total CPU utilization of the server's CPU changes to the below formula:

$$\begin{aligned} & \text{(Total \# of logged in users * Average Server CPU utilization per User)} \\ & = \text{Total Server CPU Utilization} \\ & (50 * 0.5\%) = 25\% \end{aligned}$$

Since UC optimizations redirect the processing of the video call to each user's local device, there is zero increase in the server's CPU utilization, and therefore there is no impact on performance for any of the employees' virtual machines.

HP Thin Client Unified Communications Supported Solutions

Unified Communications Optimization Packs for VDI and Cloud

UC Optimization Packs for VDI and Cloud environments are offered for many of the mainstream UC software apps and VDI network environments. Below are the UC Optimization packs for VMware Horizon, and Citrix Virtual Apps and Desktops for the most commonly used UC technologies on HP Thin Clients.

Cisco Jabber

Cisco Jabber is supported for use with Citrix Virtual Apps and Desktops OR VMware Horizon View use case by the following UC Optimization Packs:

- [Cisco Jabber Softphone for VDI \(JDVI\)](#)

Microsoft Teams

Microsoft Teams is supported for use with Citrix Virtual Apps and Desktops use case by the following UC Optimization Packs:

- [Citrix Optimization for Microsoft Teams](#)

Microsoft Teams is supported for use in a UC with VMware Horizon View use case by the following UC Optimization Packs:

- [Teams Redirection \(BETA\) \(Audio Optimization ONLY\)](#)

Zoom

Zoom is supported for use with Citrix Virtual Apps and Desktops OR VMware Horizon View use case by the following UC Optimization Packs:

- [Zoom Meeting Client for VDI](#)

Avaya Equinox

Avaya Equinox is supported for use with Citrix Virtual Apps and Desktops OR VMware Horizon View use case by the following UC Optimization Packs:

- [Avaya Equinox VDI](#)

UC Optimization Pack Support on HP Thin Client Operating Systems

UC Optimization Packs for VDI and Cloud environments are offered for many of the mainstream UC software apps and VDI network environments. Below is the support matrix (by operating system) for the UC Optimization packs for VMware Horizon, and Citrix Virtual Apps and Desktops for the most commonly used UC technologies on Windows 10 IoT and HP ThinPro HP Thin Clients.

HP Thin Clients Unified Communications Support by Operating System (Based on the latest versions of Citrix & VMWare clients)					
UC Platform	Solution	Software Type	VDI Platform	Windows 10 IoT Supported?	ThinPro Supported?
Avaya Equinox	Avaya Equinox VDI	Local Redirection	Citrix Virtual Apps & Desktops	<u>Yes</u> (download here)	<u>Yes</u> (download here)
Avaya Equinox	Avaya Equinox VDI	Local Redirection	VMware Horizon View	<u>Yes</u> (download here)	<u>Yes</u> (download here)
Jabber Softphone	Cisco Jabber Softphone for VDI	Local Redirection	Citrix Virtual Apps & Desktops	<u>Yes</u> (download here)	<u>Yes</u> (download here)
Jabber Softphone	Cisco Jabber Softphone for VDI	Local Redirection	VMware Horizon View	<u>Yes</u> (download here)	<u>Yes</u> (download here)
Microsoft Teams	Citrix-Optimized VDI Mode for MS Teams	Local Redirection	Citrix Virtual Apps & Desktops	Yes (Download via HP ThinUpdate)	Yes (Download via HP ThinUpdate)
Microsoft Teams	Horizon View VDI Mode	Local Redirection	VMware Horizon View	Yes (Download via HP ThinUpdate)	Yes (Download via HP ThinUpdate)
Zoom	Zoom VDI	Local Redirection	Citrix Virtual Apps & Desktops	<u>Yes</u> (download here)	<u>Yes</u> (download here)
Zoom	Zoom VDI	Local Redirection	VMware Horizon View	<u>Yes</u> (download here)	<u>Yes</u> (download here)

Note: There is no separate download for Teams local redirection using Citrix Virtual Apps & Desktops. To download and use Citrix Virtual Apps & Desktops you must sign into Citrix's website.

UC Optimization Pack Support on HP Thin Clients

HP Thin Clients are purpose built for VDI and Cloud computing, and support using one or more UC technologies on VMware Horizon or Citrix Virtual Apps and Desktops to enable users to communicate and collaborate with the same ease and functionality as local applications.

The below table details the HP Thin Client tested and supported UC optimization packages for a UC with VDI or Cloud use case running the HP ThinPro operating system (Version 7.2) and the latest version of clients/add-ons.

		HP ThinPro											
		t430 (4Gb)	t530	t540	t630	t640	t730	t740	mt21	mt22	mt32	mt45	mt46
Citrix Virtual Apps and Desktops	Microsoft Teams VDI (1)	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Zoom VDI (1)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Avaya Equinox VDI		✓		✓		✓						
	Cisco JVDI (Jabber)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Cisco Webex Teams VDI (3)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
VMware Horizon View	Microsoft Teams VDI (2)	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Zoom VDI (2)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Avaya Equinox VDI		✓	✓	✓		✓						✓
	Cisco JVDI (Jabber)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Cisco Webex Teams VDI (3)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

- ✓ HP's testing shows that the listed VDI optimization is fully functional on the corresponding device.
 - HP's testing shows that the listed VDI optimization does not yet function on the corresponding device. Future improvements to the VDI optimization may enable functionality; this white paper will be updated to reflect such changes at that time.
 - ┌ A blank cell indicates that the VDI optimization is not available for the corresponding device. Future improvements to the VDI optimization may enable functionality; this white paper will be updated to reflect such changes at that time.
1. HP's testing shows that the Citrix Optimization for Microsoft Teams runs on this device. Use of the Citrix Optimization for Teams may incur lower performance and result in a sub-optimal user experience. Citrix has committed to optimizing the Optimization Pack to improve performance in the future.
 2. HP's testing shows that the VMware Optimization for Zoom runs on this device. The VMware Optimization for Zoom is in its early stages of development, and therefore use of it may incur lower performance and result in a sub-optimal user experience. VMware has committed to optimizing the Optimization Pack to improve performance in the future.
 3. Third party testing shows that the listed VDI optimization is fully functional on the corresponding device.

The below table details the HP Thin Client tested and supported UC optimization packages for a UC with VDI or Cloud use case running Microsoft's Windows 10 IoT Enterprise operating system and the latest version of clients/add-ons.

		Windows 10 IoT															
		t430	t530	t540	t628	t630	t638	t640	t730	t740	mt21	mt22	mt31	mt32	mt44	mt45	mt46
Citrix Virtual Apps and Desktops	Microsoft Teams VDI ⁽¹⁾	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Zoom VDI ⁽¹⁾	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Avaya Equinox VDI					✓			✓				✓		✓		
	Cisco WebEx Teams ⁽³⁾			✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
VMWare Horizon View	Microsoft Teams VDI ⁽²⁾	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Zoom VDI ⁽²⁾	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Avaya Equinox VDI					✓			✓				✓		✓		
	Cisco WebEx Teams ⁽³⁾			✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

- ✓ HP's testing shows that the listed VDI optimization is fully functional on the corresponding device.
 - HP's testing shows that the listed VDI optimization does not yet function on the corresponding device. Future improvements to the VDI optimization may enable functionality; this white paper will be updated to reflect such changes at that time.
 - ┘ A blank cell indicates that the VDI optimization is not available for the corresponding device. Future improvements to the VDI optimization may enable functionality; this white paper will be updated to reflect such changes at that time
- 1 HP's testing shows that the Citrix Optimization for Microsoft Teams runs on this device. Use of the Citrix Optimization for Teams may incur lower performance and result in a sub-optimal user experience. Citrix has committed to optimizing the Optimization Pack to improve performance in the future.
 - 2 HP's testing shows that the VMware Optimization for Zoom runs on this device. The VMware Optimization for Zoom is in its early stages of development, and therefore use of it may incur lower performance and result in a sub-optimal user experience. VMware has committed to optimizing the Optimization Pack to improve performance in the future.
 - 3 Third party testing shows that the listed VDI optimization is fully functional on the corresponding device.

HP Thin Client Device Recommendations for Unified Communications

Unified Communications encompasses the entire range of modern communication formats from quick and simple text messaging to full video conferencing and screen sharing. Each of these communication formats can require varying CPU and network workloads that can affect overall performance within VDI or Cloud network environments. Purchasing the appropriate HP Thin Client device for your UC with VDI or Cloud use case will ensure your end users are able to work together in the most efficient and effective manner possible.

The below table details HP's device recommendations for different UC with VDI or Cloud scenarios on HP Thin Clients.

ThinPro 7.2								
These platforms are connected to 2 HD (1080p) monitors.		Citrix			VMWare			
		MS Teams	Zoom	Cisco WebEx	MS Teams	Zoom	Cisco WebEx	
t430 (4Gb)	Voice	✓	✓	✓	✓	✓	✓	✓
	Voice + Screen Sharing	✗	✓	✓	✗	✓	✓	✓
	Voice + Video	✗	✓	✓	✗	✓	✓	✓
	Voice + Video + Screen Sharing	✗	✓	✗	✗	✓	✗	✗
t540	Voice	✓	✓	✓	✓	✓	✓	✓
	Voice + Screen Sharing	✓	✓	✓	✓	✓	✓	✓
	Voice + Video	✓	✓	✓	✓	✓	✓	✓
	Voice + Video + Screen Sharing	✓	✓	✓	✗	✓	✓	✓
t638	Voice	✓	✓	✓	✓	✓	✓	✓
	Voice + Screen Sharing	✓	✓	✓	✓	✓	✓	✓
	Voice + Video	✓	✓	✓	✓	✓	✓	✓
	Voice + Video + Screen Sharing	✓	✓	✓	✓	✓	✓	✓
t640	Voice	✓	✓	✓	✓	✓	✓	✓
	Voice + Screen Sharing	✓	✓	✓	✓	✓	✓	✓
	Voice + Video	✓	✓	✓	✓	✓	✓	✓
	Voice + Video + Screen Sharing	✓	✓	✓	✓	✓	✓	✓
t740	Voice	✓	✓	✓	✓	✓	✓	✓
	Voice + Screen Sharing	✓	✓	✓	✓	✓	✓	✓
	Voice + Video	✓	✓	✓	✓	✓	✓	✓
	Voice + Video + Screen Sharing	✓	✓	✓	✓	✓	✓	✓
mt22	Voice	✓	✓	✓	✓	✓	✓	✓
	Voice + Screen Sharing	✓	✓	✓	✓	✓	✓	✓
	Voice + Video	✓	✓	✓	✓	✓	✓	✓
	Voice + Video + Screen Sharing	✓	✓	✓	✗	✓	✓	✓
mt32	Voice	✓	✓	✓	✓	✓	✓	✓
	Voice + Screen Sharing	✓	✓	✓	✓	✓	✓	✓
	Voice + Video	✓	✓	✓	✓	✓	✓	✓
	Voice + Video + Screen Sharing	✓	✓	✓	✗	✓	✓	✓
mt46	Voice	✓	✓	✓	✓	✓	✓	✓
	Voice + Screen Sharing	✓	✓	✓	✓	✓	✓	✓
	Voice + Video	✓	✓	✓	✓	✓	✓	✓
	Voice + Video + Screen Sharing	✓	✓	✓	✗	✓	✓	✓

Windows 10 IoT LTSC 2019							
These platforms are connected to 2 HD (1080p) monitors.		Citrix		VMWare		AVD	
		MS Teams	Zoom	MS Teams	Zoom	MS Teams	Zoom
t430 (4Gb)	Voice	✓	✓	✓	✓	✓	✓
	Voice + Screen Sharing	X	✓	✓	✓	✓	✓
	Voice + Video	X	✓	X	✓	✓	✓
	Voice + Video + Screen Sharing	X	✓	X	✓	✓	X
t540	Voice	✓	✓	✓	✓	✓	✓
	Voice + Screen Sharing	✓	✓	✓	✓	✓	✓
	Voice + Video	✓	✓	✓	✓	✓	✓
	Voice + Video + Screen Sharing	✓	✓	✓	✓	✓	✓
t638	Voice	✓	✓	✓	✓	✓	✓
	Voice + Screen Sharing	✓	✓	✓	✓	✓	✓
	Voice + Video	✓	✓	✓	✓	✓	✓
	Voice + Video + Screen Sharing	✓	✓	✓	✓	✓	✓
t640	Voice	✓	✓	✓	✓	✓	✓
	Voice + Screen Sharing	✓	✓	✓	✓	✓	✓
	Voice + Video	✓	✓	✓	✓	✓	✓
	Voice + Video + Screen Sharing	✓	✓	✓	✓	✓	✓
t740	Voice	✓	✓	✓	✓	✓	✓
	Voice + Screen Sharing	✓	✓	✓	✓	✓	✓
	Voice + Video	✓	✓	✓	✓	✓	✓
	Voice + Video + Screen Sharing	✓	✓	✓	✓	✓	✓
mt22	Voice	✓	✓	✓	✓	✓	✓
	Voice + Screen Sharing	✓	✓	✓	✓	✓	✓
	Voice + Video	✓	✓	✓	✓	✓	✓
	Voice + Video + Screen Sharing	X	✓	✓	✓	✓	✓
mt32	Voice	✓	✓	✓	✓	✓	✓
	Voice + Screen Sharing	✓	✓	✓	✓	✓	✓
	Voice + Video	✓	✓	✓	✓	✓	✓
	Voice + Video + Screen Sharing	✓	✓	✓	✓	✓	✓
mt46	Voice	✓	✓	✓	✓	✓	✓
	Voice + Screen Sharing	✓	✓	✓	✓	✓	✓
	Voice + Video	✓	✓	✓	✓	✓	✓
	Voice + Video + Screen Sharing	✓	✓	✓	✓	✓	✓

For more information

For more information about HP thin clients, visit the following websites:

- <http://www.hp.com/support> (Search for your thin client model. For documentation, select **Manuals.**)
- <http://www.hp.com/go/thinclient>

For more information about UC software and optimizations, visit the following webpages:

- [Citrix Optimization for Microsoft Teams](#)
- [Cisco JVDI \(Jabber\)](#)
- [Zoom VDI Plugins](#)
- [Zoom VDI Plugin Limitations](#)

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