Agenda

- Background
- VMware Horizon with Scalable Unified Communications
- Microsoft Lync 2013
- Cisco Virtualized Unified Communications
- Avaya VDI Communicator
- Mitel Unified Communicator Advanced
- VMware Horizon Unified Communications Compatibility Matrix
- Real-Time Audio-Video
- Summary
Background
Past Challenges with Unified Communications and VDI

<table>
<thead>
<tr>
<th>Media Hairpinning</th>
<th>Audio and video unnecessarily streamed through VDI infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bandwidth Explosion</td>
<td>Audio and video sent as raw USB traffic</td>
</tr>
<tr>
<td>Not Scalable</td>
<td>Host side rendering of audio/video</td>
</tr>
<tr>
<td></td>
<td>Reduced VM to Server ratio</td>
</tr>
<tr>
<td>No QoS</td>
<td>No granular QoS support</td>
</tr>
<tr>
<td></td>
<td>Can’t prioritize audio and video traffic</td>
</tr>
</tbody>
</table>
VMware Horizon with Scalable Unified Communications
VMware Horizon With Unified Communications

- Partnerships with 4 leading UC vendors
- Completely scalable with no effects on datacenter server
- Full Quality of Service support
- Optimized point-to-point media delivery
- High fidelity voice and video communications
New VDI / UC Architecture – Local Client Media Processing
Microsoft Lync 2013
VMware Horizon 5.2 with Microsoft Lync 2013

Rich Unified Communication and Collaboration

Overview

- Full support for VoIP and Video using Lync 2013 client on View desktops
- Completely scalable with media rendering on Windows client endpoint
- Support for PCoIP
- Lync VDI plugin performs all media processing on Windows endpoint

Benefits

- Tight integration with Microsoft Lync and Office applications
- Full collaboration capabilities with Microsoft Lync on View desktops
# Microsoft Lync 2013 Supported Features with VDI

<table>
<thead>
<tr>
<th>Features</th>
<th>Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presence</td>
<td>✔</td>
</tr>
<tr>
<td>Instant Messaging</td>
<td>✔</td>
</tr>
<tr>
<td>Desktop sharing</td>
<td>✔</td>
</tr>
<tr>
<td>Application Sharing/Powerpoint sharing</td>
<td>✔</td>
</tr>
<tr>
<td>Whiteboards</td>
<td>✔</td>
</tr>
<tr>
<td>File Transfers</td>
<td>✔</td>
</tr>
<tr>
<td>Online Meetings</td>
<td>✔</td>
</tr>
<tr>
<td>Office Integration</td>
<td>✔</td>
</tr>
<tr>
<td>VoIP</td>
<td>✔</td>
</tr>
<tr>
<td>Video Chat</td>
<td>Yes, but multi-party video chat is not supported</td>
</tr>
</tbody>
</table>
Lync 2013 Architecture

Legend:
- **Signaling**
- **Media**

![Diagram](image)

- Lync 2013 Client (User B)
- Lync Server 2013
- Lync 2013 Client (User A)
- Lync 2013 Plug-in (User A)
- View Client
- View Agent
- Windows client
- vSphere

Signaling for all modes

AV signaling

IM,P, Data Collab

PCOIP
Platforms & Protocols

**Access Machines**
- Windows 7
- Windows 8
- Windows Embedded
- Windows Thin PC

**Protocols**
- Microsoft RemoteFX
- VMware View

**Primary Thin Client Hardware Partners**
- HP
- DELL
- Wyse
# Hardware Requirements for Lync 2013 in VDI

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS</td>
<td>WES7 (works for WES7/8, Windows 7/8 and WinTPC)</td>
</tr>
<tr>
<td>CPU</td>
<td>1.5 GHz</td>
</tr>
<tr>
<td>RAM</td>
<td>At least 2 GB</td>
</tr>
<tr>
<td>Total Storage</td>
<td>Flash Memory size (thin clients): at least 4 GB</td>
</tr>
<tr>
<td></td>
<td>Disk size (for PCs): at least 4GB total</td>
</tr>
</tbody>
</table>

![Images of Dell Wyse Z90D7, Dell Wyse R90L7, Dell Wyse X90m7, HP t610, HP t5740e]
Frequently Asked Questions

Will Microsoft Lync 2010 support the Lync VDI integration with VMware Horizon

- Only Microsoft Lync 2013 will support the Lync VDI integration with any VDI solution
- Microsoft made significant updates to the Lync 2013 server to support VoIP and Video calls with VDI

What client OS can the Lync VDI plugin be installed and used on?
- The Lync VDI plugin will be supported on Windows 7, 8 and 8.1 client OS

How much bandwidth will be used for a VoIP and Video call?
- Customers should consult the Microsoft Lync documentation for bandwidth consumption for Lync audio and video calls

Will the Lync VDI plugin be supported with zero clients?
- Tera1 and Tera2 zero clients do not have the capability to install the software to support VoIP and Videoconferencing
- Tera1 and Tera2 clients do not have the horsepower to do local media processing on the client endpoint

Can I use the Lync 2013 client on Windows 8 and Windows 8.1 VM OS
- As of View 5.3, the pairing process between the Lync VDI plugin and Lync 2013 only works on Windows 7 SP1 VM OS. In Horizon 6.0, we added support for Lync VDI integration on Windows 8.1 desktops and in Horizon 6.0.1 we added support for Windows 2008 R2 as a desktop OS.
VMware Horizon 6 with Microsoft Lync 2013

Rich Unified Communications and Collaboration

Overview

- Now supported on Windows 8.0 and 8.1 VMs with Horizon 6!
- Full support for VoIP and Video using Lync 2013 client on View desktops
- Completely scalable with media rendering on Windows client endpoint
- Support for PCoIP
- Lync VDI plugin performs all media processing on Windows endpoint

Benefits

- Tight integration with Microsoft Lync and Office applications
- Full collaboration capabilities with Microsoft Lync on View desktops
Horizon 6.2 - Lync 2013 VDI Support for RDSH Desktops

Rich Unified Communications and Collaboration

Overview

- RDSH Desktop support for Lync 2013 with VDI plugin
- Full support for VoIP and Video using Lync 2013 client on View desktops
- Support for PCoIP
- Lync VDI plugin performs all media processing on Windows endpoint
- Support begins in VMware Horizon 6.2

Benefits

- Tight integration with Microsoft Lync and Office applications
- Full collaboration capabilities with Microsoft Lync on View desktops
Cisco Virtualized Unified Communication Clients
VMware Horizon with Cisco VXC 4000

Real-time voice with repurposed PCs

Overview

- Cisco soft appliance for making VoIP calls in VMware View desktops
- Cisco Unified Personal Communicator (CUPC) client runs in HVD
- Cisco Virtual Experience Media Engine (VXME) runs on client endpoint to perform media processing

Benefits

- Scalable UC with VDI with hi-fidelity audio
- Real-time voice within VDI with repurposed PCs and Windows clients
Cisco VXC 4000 Product Update

Cisco VXC 4000

- Cisco VXC 4000 EOS as of February 2014

- Cisco is targeting a replacement for the VXC 4000 in March 2014

- New VXME for Windows will pair with Cisco UC Jabber client installed in HVD

- VXME for Windows clients will run on Windows 7, 8, Windows ThinPC endpoint

- Cisco’s goal is for the VXME to be platform independent and thus align with the Jabber story

- Cisco will publish minimal hardware and management specs
VMware Horizon with Cisco VXC 6215

Integrated VDI, UC VoIP and Video

Overview

- Linux based thin client with integrated VDI and Unified Communications (UC) support
- Support for both Cisco UC Jabber and CUCI Lync clients
- High definition audio and video via local media processing
- Supported with View 5.0 and later

Benefits

- Unified workspace with access to virtual desktops, and high definition voice and video
## Cisco VXC 6215

### VXC 6215 Ecosystem

<table>
<thead>
<tr>
<th>Cisco</th>
<th>Client</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cisco Infrastructure &amp; Applications</strong></td>
<td><strong>Thin Client</strong></td>
</tr>
<tr>
<td>Cisco Unified Communications Manager 7.1.x, 8.0.x, 8.5, 8.6 and 9.0</td>
<td>Cisco VXC 6215</td>
</tr>
<tr>
<td>Cisco UC Jabber Client</td>
<td></td>
</tr>
<tr>
<td>Cisco Unified Communications Integration for Microsoft Office Communicator and Lync 8.5.6 and 8.6.1</td>
<td></td>
</tr>
</tbody>
</table>

### Agent

<table>
<thead>
<tr>
<th>Agent</th>
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</thead>
<tbody>
<tr>
<td><strong>VDI Broker</strong></td>
</tr>
<tr>
<td>VMware View 5.X and later</td>
</tr>
</tbody>
</table>

### Headset & Cameras

**Supported USB Headsets**
- Plantronics headsets – 400 and 600 series
- Jabra headsets – BN200 and Biz 4000 series
- Microsoft Lifecam Cinema
- Quickcam Pro 9000
- HD Webcam C525
- HD Webcam B910
- HD Webcam C920
Cisco VXC 6215

- VXC 6215 runs SUSE Linux
- Customers can buy VXME for Linux and install it on Wyse Z50D
- New product will be called VXME for Linux and will be a software only product, in contrast to the VXC 6215

- Cisco VXC 6215 EOS as of July 2013
- Cisco exiting thin client hardware business and recommending that customers purchase Wyse Z50D
Cisco VXC/VXME Roadmap

- **2012**: GA - Cisco VXC 4000 with View support (12/11)
- **2013**: GA - Cisco VXC 6215 with View support (VDI only) (05/12)
- **2013**: VXC 6215 SW updated to support UC with View (04/13)
- **2014**: Cisco VXME for Linux with Dell/Wyse Z50D support (08/13)
- **2014**: VXME for Windows replaces VXC 4000 (03/14)

**End-of-Life**
- **2013**: EOS - VXC 4000 (08/13)
- **2014**: EOS - VXC 4000 (02/14)
Frequently Asked Questions

Can customers use Cisco IP Communicator (CIPC) for VoIP on virtual desktops?

• No. CIPC has not been re-architected to work inside VDI and will result in poor quality - Cisco will not support this

Do Cisco VXC clients support QoS?

• Cisco VXME encodes audio/video in standardized codecs and fully supports QoS

Does Cisco support VXME on zero clients?

• No, Teradici zero clients can’t support media offload capabilities.

What clients OS is VXME supported on?

• VXME for Windows is supported on Windows clients
• VXME for Linux is supported on Linux thin clients

How much bandwidth will be used for a VoIP and Video call?

• Customers should consult the Cisco VXME documentation for bandwidth consumption for Cisco UC audio and video calls
• Bandwidth per call for VXME is equivalent to Cisco softphone
Avaya VDI Communicator
Avaya VDI Communicator
… solving for scale & QoS for improved real-time communications in VDI

<table>
<thead>
<tr>
<th>Performance</th>
<th>• off loads processing of real time communications to thin client or PC and Avaya Aura</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survivability</td>
<td>• basic voice if connection to data center or virtual PC is down</td>
</tr>
<tr>
<td>Flexibility</td>
<td>• works in various customer environments; choice of vendors within the VDI ecosystem</td>
</tr>
<tr>
<td>Software only</td>
<td>• no Avaya hardware required</td>
</tr>
<tr>
<td></td>
<td>• deskphone is optional</td>
</tr>
<tr>
<td>Collaboration</td>
<td>• Voice, IM/Presence, contacts / directory, conferencing, messaging</td>
</tr>
</tbody>
</table>

Virtual Desktop
• Avaya one-X Communicator view
• VDI Communicator on HP or Dell Wyse Thin Clients; or Windows PC
• Support for VMware View
Avaya one-X Communicator for VDI environments

Avaya one-X Communicator in deskphone mode

Avaya one-X Communicator on virtual machines in the data center

Avaya VDI Communicator

Avaya one-X Communicator with Avaya VDI Communicator on thin client
Avaya Real-Time Desktop Virtualization Architecture

Avaya Approach

- Media direct to client
- Lighter load on server
- QoS model supported
- Call path unaffected by VDI architecture

“Headless Client” on end-point

- Media terminated locally
- “Remote Control” of Real Time app is extended to ‘local client’ on the VDI end point
- Session Down UI for loss of connection scenarios

Remote desktop protocol (e.g. VMware View PCoIP)
Avaya VDI Communicator User Interface

**Everyday scenario**

- Avaya one-X Communicator running on virtual PC in the data center accessed via thin client

**Loss of connectivity or VM machine down**

- Avaya VDI Communicator client running on the thin client
  - Problem with the virtual machine
  - Problem in the data center
  - Problem with the network between data center and thin client
Avaya VDI Communicator Release 1.0
Supporting an open ecosystem

Avaya Infrastructure & Clients
- Avaya Aura Communication Manager 6.0+
- Avaya Aura Session Manager 6.0+
- Avaya one-X Communicator SIP 6.1 SP5

Agent

VDI Broker
- VMware View 5.X

Client

<table>
<thead>
<tr>
<th>Thin Client</th>
<th>OS</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP T510</td>
<td>WES7 or ThinPro 4.1</td>
</tr>
<tr>
<td>HP T610</td>
<td>WES7 or ThinPro 4.1</td>
</tr>
<tr>
<td>HP T5740e</td>
<td>WES7</td>
</tr>
<tr>
<td>HP T 5565</td>
<td>ThinPro (Linux) 4.1</td>
</tr>
<tr>
<td>Dell-Wyse R50L</td>
<td>SLETCl1 SP1</td>
</tr>
<tr>
<td>Windows PC</td>
<td>Windows 7 32/64 bit</td>
</tr>
<tr>
<td>Windows PC</td>
<td>Windows XP SP3 32 bit</td>
</tr>
</tbody>
</table>

Headset

Supported USB Headsets
- Plantronics Blackwire C300 Series
- Plantronics Blackwire C400 Series
- Plantronics Blackwire C600 Series
Mitel Unified Communicator Advanced
Mitel Unified Communicator Advanced (UCA)

Rich Unified Communications with VMware Horizon Desktops

Overview

- Virtualized UCC delivered on VMware
- Audio, email and voice messaging virtualization platform
- Mitel's UCA supports UC features - voice, presence, secure instant messaging

Benefits

- Rich VoIP for VMware View desktops
- Support for repurposed PCs and Windows clients
<table>
<thead>
<tr>
<th>UC Product</th>
<th>Description</th>
<th>Capabilities</th>
<th>Supported VMware View Release</th>
<th>Clients Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft Lync 2013</td>
<td>Microsoft Lync 2013 client is a UC application that is integrated with Microsoft Office 2013. Provides access to rich collaboration features, such as presence and IM, and the ability to make VoIP and Video calls all from within a View desktop.</td>
<td>VoIP and Video</td>
<td>VMware View 5.2 and later</td>
<td>Windows clients only</td>
</tr>
<tr>
<td>Cisco VXC 4000</td>
<td>Cisco VXC 4000 is a software appliance that supports high-quality, real-time interactive voice in a virtual desktop environment on Windows PCs</td>
<td>VoIP only</td>
<td>VMware View 5.0 and later</td>
<td>Windows clients only</td>
</tr>
<tr>
<td>Cisco VXC 6215</td>
<td>Cisco Linux based thin-client with integrated VDI, VoIP and Video chat capabilities. Cisco UC Jabber client offers high definition VoIP and Video communications</td>
<td>VoIP and Video</td>
<td>VMware View 5.0 and later</td>
<td>Cisco Linux thin client</td>
</tr>
<tr>
<td>Avaya VDI Communicator</td>
<td>Avaya VDI communicator is Avaya softphone solution that allows scalable real-time audio to work optimally in VDI environment</td>
<td>VoIP only</td>
<td>VMware View 5.0 and later</td>
<td>Linux and Windows clients</td>
</tr>
<tr>
<td>Mitel UCA</td>
<td>Virtualized Mitel Unified Communicator Advanced (UCA) application that provides integrated UC capabilities, including ability for real-time audio in View desktops.</td>
<td>VoIP only</td>
<td>VMware View 5.0 and later</td>
<td>Windows clients only</td>
</tr>
</tbody>
</table>
Real-Time Audio-Video
Real-Time Audio-Video (RTAV)

*Improved Webcam and Headset experience and performance*

**Overview**

- Optimized delivery of webcam & microphone traffic for View desktops
- Encoded and compressed video reduces upstream bandwidth for webcam traffic to as low as 300kbps
- Improves installation and administration of webcam devices
- *Windows clients supported as of July 2013*
- *Linux client support in Q4 2013 and Mac client support in Q1 2014*

**Benefits**

- Broader application support with webcams and headsets
- Improved end user experience
- Lower (100x) bandwidth consumption
“Real-Time Audio-Video” Overview

**Before**
- Headsets/Webcams were unsupported with VMware Horizon desktops, unless specifically used with optimized UC vendor solutions
- USB redirection of webcams and headsets resulted in bandwidth explosion
  - Single webcam stream can result in 60 Mbps upstream to remote desktop
  - Due to bandwidth explosion, unable to support USB webcam redirection over WAN

**After**
- Broader application support for use headset/webcam audio and video
- Audio/video from microphone/webcam is encoded and compressed on client endpoint
  - Bandwidth reduction to as little as 300-600kbps
How “Real-Time Audio-Video” works

- Audio and video captured on client device
- Audio/video encoded and compressed
- Compressed audio/video sent back to remote desktop
- On View desktop, audio/video decoded and presented to virtual webcam driver and virtual audio driver

View Client

Encoded audio/video

Compressed

View Agent

Webex

Skype

GoogleTalk

Adobe Connect
## Comparison: Real-Time Audio-Video vs. UC Optimized Solution

<table>
<thead>
<tr>
<th></th>
<th>Real-Time Audio-Video</th>
<th>UC Optimized Solution (Microsoft, Cisco, Avaya, Mitel)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>VMware delivered “Real-Time Audio-Video” to enable improved microphone/webcam performance with View desktops</td>
<td>Solutions from UC providers that work optimally in VDI environment</td>
</tr>
<tr>
<td><strong>Use Cases</strong></td>
<td>General bi-directional audio/video support with applications inside VDI desktops</td>
<td>Enterprise grade UC VoIP and video chat, call centers, etc.</td>
</tr>
<tr>
<td><strong>Media processing</strong></td>
<td>All media is host-side rendered</td>
<td>All media is rendered on client endpoint</td>
</tr>
<tr>
<td><strong>Pros</strong></td>
<td>• Broader generalized application support</td>
<td>• Completely scalable (client-side rendered media)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Point-to-Point media delivery</td>
</tr>
<tr>
<td><strong>Cons</strong></td>
<td>• Host-side rendered solution</td>
<td>• Limited application support</td>
</tr>
<tr>
<td></td>
<td>• Media hairpinning</td>
<td></td>
</tr>
</tbody>
</table>
Recap of Real-Time Audio-Video

- RTAV provides general bi-directional audio and video support
- Complementary technology to UC optimized solutions from UC partners and not a replacement!
- Broadens application support for headsets and webcams
- RTAV does not avoid media hairpinning and does not provide scalability benefits of UC optimized solutions
## VMware Horizon Real-Time Audio-Video Timeline

<table>
<thead>
<tr>
<th>Version</th>
<th>RTAV Support Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>View 5.2 FP2 &amp; CRT 5.3</td>
<td>• RTAV support on Windows clients</td>
</tr>
<tr>
<td>View 5.3 FP1 &amp; CRT 2.2</td>
<td>• RTAV support on Linux clients</td>
</tr>
<tr>
<td>View 5.3 FP2 &amp; CRT 2.3</td>
<td>• RTAV support on Mac clients</td>
</tr>
<tr>
<td>Horizon 6.0.1</td>
<td>• New RTAV virtual webcam driver for broader application support</td>
</tr>
</tbody>
</table>
Summary: Real-Time Audio-Video

- Real-Time Audio-Video broadens application support for use with microphones/webcams with VMware Horizon desktops
- Real-Time Audio-Video is a complementary technology to UC optimized solutions
  - When webcam or microphone not in use, UC applications can control and use webcam/microphone
- Understand the use-cases for Real-Time Audio-Video
- Do not position Real-Time Audio-Video as a replacement for UC vendor solutions
- Real-Time Audio-Video has been tested and will be supported with Cisco Webex, Skype and GoogleTalk
Key Takeaways

- Understand use case for UC and bi-directional audio/video
- Not all UC vendors are supported with VMware Horizon
- Know which clients endpoints support media offload capabilities with UC integration with VMware Horizon
- Real-Time Audio-Video adds general bi-directional audio/video support with tested applications
- Host side rendering of audio and video increases load on datacenter server – not scalable