

About this release

May 01, 2015

Citrix supports two primary alternative methods for optimized delivery of the Microsoft Lync client from XenApp and XenDesktop:

- Full support for Microsoft's Lync 2013 VDI Plug-in (media engine) with the Citrix Receiver for Windows.
- Citrix HDX RealTime Optimization Pack for Microsoft Lync.

Citrix recommends the Microsoft Lync VDI Plug-in for customers using Lync 2013 with Windows devices. For information about this solution, see <http://technet.microsoft.com/en-us/library/jj204683.aspx> and <http://support.citrix.com/article/CTX138408>.

HDX RealTime Optimization Pack for Microsoft Lync provides a highly scalable solution for delivering real-time audio-video conferencing and VoIP enterprise telephony through Microsoft Lync in XenDesktop and XenApp environments to users on Linux, Mac, and Windows devices. HDX RealTime Optimization Pack leverages your existing Microsoft Lync infrastructure and inter-operates with other Microsoft Lync endpoints running natively on devices.

HDX RealTime Optimization Pack consists of both client and server components:

- The client component, called HDX RealTime Media Engine, integrates with Receiver on the endpoint device and performs all signaling and media processing directly on the user device itself, offloading the server for maximum scalability, minimizing network bandwidth consumption and ensuring optimal audio-video quality.
- The server-side (and virtual desktop) component, HDX RealTime Connector for Microsoft Lync, is a connector to the Microsoft Lync client that drives the RealTime Media Engine on the endpoint. RealTime Connector runs in the virtual server environment alongside Microsoft Lync and communicates signaling information over a Citrix ICA virtual channel to the RealTime Media Engine running on the user device.

Feature overview

HDX RealTime Optimization Pack for Microsoft Lync 1.6 offers clear, crisp high-definition audio/video calls with Microsoft Lync in an optimized architecture. Users can seamlessly participate in audio-video or audio-only calls to and from other Lync users and other standards-based video desktop and conference room multipoint control unit (MCU) systems. All audio/video processing is offloaded from the Server to the end-user device or terminal, optimizing the quality of the call with minimal impact on server scalability.

The HDX RealTime Optimization Pack for Microsoft Lync provides XenApp and XenDesktop customers the following key features:

- Optimizes Lync audio and video calling on Windows, Linux, and Macintosh devices.
- Compatible with Lync 2010 client.
- Compatible with Lync Server 2013, Lync Server 2010, and Lync Online (Office 365).
- Enables call initiation from the Lync contacts list and from the Lync Conversation window.
- Provides separate call window that displays optimized video and provides call controls (hold, transfer, hang-up, and so forth).
- Supports both point-to-point and multi-party calling.
- Supports Microsoft's proprietary RT-Audio codec. Also supports industry standards G.771, G.722, G.722.1, and G.722.1c for audio calls from 3 kHz to 14 kHz (ultra wideband).
- Supports RT-Video, H.264, H.263, H.263+, and H.263++ video codecs. Video call rates range from 128kb/s to 2048kb/s. All

video is encoded at up to 30fps (depending on the webcam used) and transmitted over RTP or TCP.

- Includes HD support and the following video resolutions on Windows and Linux client devices:
 - 720P30 (1280 X 720 pixels)
 - 4CIF resolution (704 X 576 pixels)
 - VGA resolution (640 X 480 pixels)
 - CIF resolution (352 X 288 pixels)
 - SIF (352 X 240)
 - QCIF resolution (176 X 144 pixels) or QSIF (176 X 120)
- Optimizes Quality-of-Experience (QoE) through adaptive jitter buffer, packet loss concealment, call rate adaptation, and other techniques.
- Provides fallback to server-side media processing (Generic HDX RealTime) if there is no HDX RealTime Media Engine present on the user device.
- Supports Lync-certified USB phones and headsets on Windows and Linux devices.
- Supports most webcams including built-in webcams on Windows devices.

What's new

- Support for Lync Online (Office 365 hosted Lync) using Active Directory Federation Services (ADFS) with RealTime Connector 1.6 and RealTime Media Engine 1.6 or 1.5. Using AD FS removes the requirement to maintain Lync user accounts in the Microsoft cloud.
- Support for Lync Certified USB phones on Linux endpoints.
- Support for backward compatibility:
 - Support RealTime Connector 1.6 using RealTime Media Engine 1.5 and vice versa. Aids gradual deployment of your 1.6 system if you are already running a 1.5 system.
Note: Lync Online /ADFS integration is available only after installing RealTime Connector1.6 (with either RealTime Media Engine 1.5 or 1.6). Linux USB HID device display support is available only with Linux RealTime Media Engine 1.6 (with either RealTime Connector 1.5 or 1.6).
 - There is no RealTime Media Engine 1.6 version for Mac, but the RealTime Media Engine 1.5 is fully supported with RealTime Connector 1.6. Lync USB phone support is not being offered to Mac users in this release.

Limitations in version 1.6

Citrix recommends that you deliver the Lync client using generic HDX RealTime technologies, Local App Access, or Microsoft Lync 2013 VDI Plug-in if your users need the following features that are not supported by HDX RealTime Optimization Pack for Lync:

- Call forwarding/simultaneous ringing
- Call park/pick-up
- Drag-and-drop of participants
- Response group indicator
- Multi-view video ("gallery view")
- Delegation
- Agent anonymization
- Voice mail notification of missed calls
- Audio recording

For more information about alternative methods of delivering the Lync Client from XenApp and XenDesktop, see <http://support.citrix.com/article/CTX200279>.

Known issues

Jan 07, 2015

Fixed issues

For issues fixed in this release, see <http://support.citrix.com/article/CTX141448>.

General

Caution: Editing the registry incorrectly can cause serious problems that may require you to reinstall your operating system. Citrix cannot guarantee that problems resulting from the incorrect use of Registry Editor can be solved. Use Registry Editor at your own risk. Be sure to back up the registry before you edit it.

- When a VDI user starts a group video call, the invitees' share buttons are grayed out. [#481766]
- When using Receiver for Windows 3.0, your users may have problems logging off or shutting down while their VDA windows are open. It is recommended that you upgrade your users to Receiver for Windows 4.x. [#16698]
- When Remote PC Access is enabled on a device and you try to start the RealTime Connector and the RealTime Media Engine from the device, you might have to wait a short period of time for the RealTime Media Engine to initialize. Wait about one minute before you try to place a call. [#14438]
- When attempting to make high-definition video calls from a home office, take into account your user's network bandwidth and ISP routing policies. If you observe pixilation of the video or problems with lip sync, adjust the Maximum Packet Size (MTU) on the network interface card properties to a lower value such as 900 to avoid situations where ISPs perform traffic shaping based on packet size.
- Occasionally on devices running Linux Ubuntu 11 on 32-bit systems, you can experience poor video quality—namely flickering image—during a call. To improve video quality, increase foreground and decrease background lighting and adjust the anti-flicker setting on the transmitting camera.
- On some HP T610 terminals running Ubuntu 10.4 Linux operating system, the PulseAudio network sound server may not start at system initialization or become disabled during operation. In such cases, contact HP to receive the latest version of their terminal software.
- When you try to invite a participant using a phone number, communicator.exe might crash. [# 519183]
Workaround:

```
HKEY_LOCAL_MACHINE \SOFTWARE Wow6432Node\Citrix\HDXRTConnectorLC
```

```
Name:DisableMeetNowUIHandlers
```

```
Type: REG_DWORD
```

```
Data: 2
```

HDX RealTime Media Engine

- Uninstalling the Citrix Receiver, uninstalls HDX Real Time Media Engine. You must reinstall HDX Real Time Media Engine after installing Receiver. For more information, see <http://support.citrix.com/article/CTX200340>. [#484913]
- Sometimes, when attempting to install HDX RealTime Media Engine on Windows, a message indicates that there is no available disk space. However, limited space does exist on the Z:/ drive of the terminal. This is a known issue for Microsoft installers and applies to Citrix Receiver as well.
- If the screen saver is not disabled by Citrix HDX RealTime Media Engine during an active call on a Linux terminal, the RealTime Media Engine might disconnect the call. To work around this problem, move the mouse occasionally or call back. [#16110]

- The RealTime Media Engine software rejects incoming call attempts sent from the LifeSize Express 220 without signaling an incoming call dialog to the user. [#14762]
- During installation or un-installation, it is possible to encounter certain error conditions where the error message string is not localized. [#14530, #93]
- In Seamless mode, the following issues exist for Full Screen video:
 - Full Screen video appears in letterbox format with the Linux version of the RealTime Media Engine in Seamless mode. [#13564]
 - The Full Screen Control hides behind other apps in a Seamless session in XenApp Seamless mode. [#10731, #3]
- In some cases, when a user opens the Video page of Tools > Audio Video Settings, the display presents a black preview window, and the RealTime Connector does not display video during a call. This problem has been observed in the following environment: a terminal device running SUSE Linux Enterprise Desktop (SLED) 11 SP1 and XenDesktop servers running Windows7. The problem occurs because the RealTime Media Engine requires an accelerated video driver to use the XVideo extension. The standard SLED 11 SP1 distribution may not include that driver. As a result, no video is rendered on the terminal screen. To resolve the problem, update to SLED 11 SP2, which contains the required driver to render the video normally.
- Some Plantronics audio devices containing buttons might be mistaken for mouse-type devices by Linux. When a user presses a button, Linux interprets it as a mouse button press and prevents the regular mouse from working correctly until the call is terminated. Workaround: Configure the Linux X11 graphics subsystem to ignore Plantronics devices as sources of user input. [#521088]

```
Section "InputClass"
```

```
Identifier "Plantronics"
```

```
MatchVendor "Plantronics"
```

```
Option "Ignore" "true"
```

```
EndSection
```

HDX RealTime Connector for Microsoft Lync

- Some report that video disappears (black screen appears) several times during the first 5 seconds just after conference creation. Others have reported a green frame displayed during the initial few seconds of video. This problem goes away after a few seconds. [#16312]
- When you use a Macintosh laptop as a terminal, your built-in camera does not work when HDX RealTime Connector for Microsoft Lync is in non-optimized (fallback) mode.
- Lync Native calling is disabled by default. However, if the administrator enables Lync Native calling, you can accept a call using Lync Native calling when HDX RealTime Connector for Microsoft Lync is installed. To prevent this, make sure that built-in Lync calling is disabled when running Citrix HDX Optimization Pack.
- Selecting a device and then navigating to the advanced tab and back to the device tab causes the selected device to revert to the one that was originally selected. The workaround is to exit the dialog after selecting the new device. [#13450]

System Requirements

Mar 09, 2015

Environments

HDX RealTime Optimization Pack 1.6 supports Microsoft Lync 2010 client and Microsoft Lync 2010 and Microsoft Lync 2013 server configurations.

HDX RealTime Optimization Pack 1.6 supports the following Citrix environments:

- XenDesktop 5.0, 5.5, 5.6, 5.6 Feature Pack 1, and XenDesktop 7, 7.1, 7.5, 7.6
- XenApp 6.0, 6.5, 6.5 Feature Pack 1, and 6.5 Feature Pack 2, XenApp 7.5, 7.6

For more information about XenDesktop and XenApp editions that include Lync optimization, see the following:

- [XenApp features by edition](#)
- [Compare XenDesktop features by edition](#)

HDX RealTime Connector for Microsoft Lync 2010

You install HDX RealTime Connector for Microsoft Lync 2010 on XenDesktop virtual desktops or on servers in your XenApp farm.

- Supported operating systems:
 - Desktops: Microsoft Windows 7, 8, 8.1
 - Servers:
 - Microsoft Windows Server 2008 R2
 - Windows Server 2012 R2 – Note: Though Citrix successfully tested on this operating system, Microsoft does not list it as a supported operating system for Microsoft Lync.
- Memory: minimum 4 GB RAM, 120 MB paging file
- Disk space: minimum 100 MB available
- Network interface: full-duplex Ethernet TCP/IP local network connection
- Software:
 - DirectX 9 (minimum)
 - Microsoft .NET 3.5 SP1
 - Microsoft Lync 2010 (32-bit)

Installation prerequisite

Before installing HDX RealTime Connector for Microsoft Lync on a host running Windows 7, turn off Administrator mode for Microsoft Lync.

1. Right-click the Microsoft Lync shortcut on your Desktop or in the list of programs in the Start Menu and choose Properties.
2. In the Properties dialog box, click the Compatibility tab.
3. On the Compatibility tab, ensure the Run this program as an administrator checkbox is cleared.

HDX RealTime Media Engine/Client Device

You install the HDX RealTime Media Engine on the client device.

Make sure you have installed a certificate for the Microsoft Lync Server on the client device and that the certificate specifies the correct domains that are associated with the Microsoft Lync Server. The Certificate domains should match the SIP Addresses of Record that use the RealTime Connector and the HDX RealTime Media Engine. If there is more than one domain, make sure you list them in the Subject Name and Subject Alternative Name values on the Certificate. If you do not do this, your Citrix HDX RealTime Media Engine cannot authenticate with the Lync Server.

Important: Thin client manufacturers make changes to the specifications of a device without notice. These lists apply to the configurations provided at the time of testing.

Supported terminals:

Dell Wyse

Model	Processor	Operating System
R90L	1.5GHz* AMD Sempron	Microsoft Windows XP E
R90LE	1.5GHz AMD Sempron	Microsoft Windows XP E
R90LW	1.5GHz AMD Sempron	WES 2009
R90LEW	1.5GHz AMD Sempron	WES 2009
R90L7	1.5GHz AMD Sempron	WES 7
R90LE7	1.5GHz AMD Sempron	WES 7
Z90SW	AMD G-T52R 1.5GHz	WES 2009
Z90DW	Dual core AMD G-T56N 1.65GHz	WES 2009
Z90S7	AMD G-T52R 1.5GHz	WES 7
Z90D7	Dual core AMD G-T56N 1.65GHz	WES 7
Z90DE7	Dual core AMD G-T56N 1.65GHz	WES 7
D90D7	AMD G-T48E 1.4Ghz	WES 7
Z90Q7	AMD GX-420CA SOC 2GHz	WES 7
D90Q7	AMD GX-415GA SOC 1.5GHz	WES 7

Z90D8 Model	Dual core AMD G-T56N 1.65GHz Processor	WE8S Operating System
D90D8	AMD G-T48E 1.4Ghz	WE8S
Z90Q8	AMD GX-420CA SOC 2GHz	WE8S
D90Q8	AMD GX-415GA SOC 1.5GHz	WE8S
Z50S	AMD G-T52R 1.5GHz	SUSE Linux 11 SP1/SP2
Z50D	Dual core AMD G-T56N 1.65GHz	SUSE Linux 11 SP1/SP2
R50L	1.5GHz AMD Sempron	SUSE Linux 11 SP1
R50LE	1.5GHz AMD Sempron	SUSE Linux 11 SP1
X50m	Dual core AMD G-T56N 1.65GHz	SUSE Linux 11 SP1/SP2
D50D	AMD G-T48E 1.4Ghz	SUSE Linux 11 SP2

HP

For the combination of an HP T610 terminal with HP Thin Pro (Ubuntu Linux 10.04), the following issues can occur:

- Before you run the Citrix HDX RealTime Media Engine on a terminal, obtain a patch from Hewlett-Packard to fix a problem with the PulseAudio service.
- If you insert a new audio device on a terminal and the device is not recognized by the Citrix HDX RealTime Media Engine or the Citrix HDX Realtime Connector for Microsoft Lync software, reboot the terminal.

Model	Operating System	Citrix HDX Ready Premium
t510	Smart Zero Core	http://www.citrix.com/ready/en_us/hewlett-packard-company/hp-t510-thin-client
t510	ThinPro	http://www.citrix.com/ready/en_us/hewlett-packard-company/hp-t510-thin-client
t510	Windows Embedded Standard 2009	http://www.citrix.com/ready/en_us/hewlett-packard-company/hp-t510-thin-client
t510	Windows Embedded Standard 7	http://www.citrix.com/ready/en_us/hewlett-packard-company/hp-t510-thin-client
t620	Smart Zero Core	http://www.citrix.com/ready/en_us/hewlett-packard-company/hp-t620-flexible-thin-client

Model	Operating System	Citrix HDX Ready Premium
t620	Windows Embedded Standard 7	http://www.citrix.com/ready/en_us/hewlett-packard-company/hp-t620-flexible-thin-client
t820	Windows Embedded Standard 7	http://www.citrix.com/ready/en_us/hewlett-packard-company/hp-t820-flexible-thin-client
mt41 mobile	Windows Embedded Standard 7	http://www.citrix.com/ready/en_us/hewlett-packard-company/hp-mt41

Centerm

Model	Processor	Operating System
C32	Dual core Intel D2550 1.86 GHz	WES 7
E1945-3	Dual core Intel D2550 1.86 GHz	WES 7

IGEL

IGEL claims support for the HDX Optimization Pack with all of its Linux thin clients as of Version 4.10.100.

Supported operating systems

You can install HDX RealTime Media Engine on devices running any of the following operating systems:

- Microsoft Windows 7, Microsoft Windows 8 and 8.1, Windows 2012 R2, Windows Vista, or Microsoft Windows XP
- Microsoft Windows devices: WES 7, WES 2009, Microsoft Windows XPe, or Microsoft Windows Thin PC (TPC)
- Linux (Ubuntu 11, Ubuntu 10.04, or RedHat 6.2)
- Linux (SUSE Enterprise SP1/SP2)
- Unicon claims support for the HDX Optimization pack for Microsoft Lync 2010 on eLux RP 4.3.0.

Important: Macintosh OS X is not supported on this version of HDX RealTime Media Engine. To run on a Macintosh OS X, use HDX RealTime Media Engine version 1.5. RealTime Connector 1.6 is supported with RealTime Media Engine 1.5.

Citrix Receivers

HDX RealTime Media Engine works with all currently supported Citrix Receivers for Windows, Mac, and Linux.

Requirements for audio and video calling:

- RealTime Connector can support video calls in high-definition (HD) video. The RealTime Media Engine measures the speed of the user device and then encodes HD video if the camera, the host device, the bandwidth setting, and the remote endpoint support high-definition specifications.
- Camera:
 - Most USB webcams are supported. Citrix recommends the Logitech Webcam model C920 because it includes H.264 video encoding, offloading the CPU of the user device.
 - Resolution: 320 x 240

- Color space: 1420 or YUY2
- Frame rate of at least 10 fps, 24 fps for HD video
- Native driver or supporting Windows UVC driver
- Audio input/output must be DirectSound-compatible and capable of 16-bit mono or stereo sound at 16,000, 32,000, or 44,100 samples per second. A USB headset is recommended.

Requirements for Lync-compatible USB telephone calling:

HDX RealTime Connect for Lync supports Lync-compatible USB telephone devices, including wired and wireless phones, speaker phones, and headsets. For full information about supported devices, see [Microsoft Lync-compatible USB telephone devices](#).

Citrix Receiver requirements:

The terminal device must have one of the following Receivers installed:

- Citrix Receiver for Mac 11.7 or 11.8.2
- Citrix Receiver for Windows 4.1 or 4.2
- Citrix Receiver for Linux 12.1, 13.0, or 13.1

Tested Human Interface Devices (HIDs)

Vendor	Devices tested	Endpoint OS	Audio support	Display support	Call control support
Plantronics	Calisto 620-M Calisto 240-M	Win/Linux	Yes	Yes	Yes
	Blackwire USB corded headsets (Includes Blackwire 500-M series, Blackwire 300-M series, Blackwire 700-M series, Blackwire 435-M)	Win (Linux also tested with Blackwire 500-M)			
	Voyager Legend UC-M	Win/Linux			
	Savi 400-M series	Win			
	Savi 700-M series	Win/Linux			
	H-series headsets with DA45 adapters	Win			
Jabra	9650	Win/Linux	Yes	N/A	Yes
Polycom	CX200 CX300	Win/Linux	Yes	Yes	Yes

Vendor	Devices tested	Endpoint OS	Audio support	Display support	Call control support
	PRESENCE UC ML	Win/Linux	Yes	N/A	Partial: Hang-up/Volume/Mute: working *Answer and **Flash: not working Workarounds: *Use the on-screen UI to answer calls **Use the on-screen UI to switch between calls (the primary function of the Flash button)

Third-party video drivers and Citrix HDX RealTime Optimization Pack

The Microsoft Windows operating system installed on some thin client terminals often does not include Windows USB video class (UVC) drivers for web cameras, although these drivers have been included with standard Microsoft Windows XP and Vista operating systems since SP2. When you install a web camera on a terminal device, the installation program may report that it does not have required files.

We recommend that you use the standard Windows device drivers for webcams because vendor-supplied drivers can sometimes cause crashes and Blue Screen events on certain platforms (especially 64-bit Windows).

How to download HDX RealTime Optimization Pack 1.6

Jan 06, 2015

Citrix recommends that you install HDX RealTime Optimization Pack 1.6. You can install 1.6 as new installations or as updates to previously installed components from versions 1.0 to 1.4.100.

You can download version 1.6 by logging on with your My Account credentials and going to the following download pages:

- [XenDesktop 7.6 Platinum Edition](#)
- [XenDesktop 7.6 Enterprise Edition](#)
- [XenApp 7.6 Platinum Edition](#)
- [XenApp 7.6 Enterprise Edition](#)

After downloading, unzip the package and place the following installation files on an available network drive or on a local device, such as a USB flash drive.

For Windows:

- Citrix HDX RealTime Media Engine.msi — client running Receiver
- HDX RealTime Connector LC.msi — server-side (and virtual desktop)

For more information, see [Deploy HDX RealTime Media Engine to Windows devices](#).

For Linux:

- HDXRTME_install.sh
- citrix-hdx-realtime-media-engine-1.6.0-115_i386.deb
- citrix-hdx-realtime-media-engine-1.6.0-115_i386.rpm

For more information, see [Deploy HDX RealTime Media Engine to Linux terminal devices](#).

For Mac (with HDX RealTime Media Engine 1.5) download at [HDX RealTime Optimization Pack 1.5 for Microsoft Lync](#):

- HDXRealTimeMediaEngine.dmg

For more information, see [Deploy HDX RealTime Media Engine 1.5 to Mac devices](#).

Now you can make HDX RealTime available to your users. Before installing the HDX RealTime Media Engine or HDX RealTime Connector for Microsoft Lync, be sure your environment meets the minimum software hardware and software requirements.

Install

Jan 06, 2015

If you have not already downloaded the installation files for HDX RealTime Optimization Pack, see [How to download HDX RealTime Optimization Pack 1.6](#).

The order of the HDX RealTime Optimization Pack installation is important:

1. If Receiver is running, close it.
2. Install RealTime Media Engine on your users' devices.
3. Start XenDesktop.
4. Install RealTime Connector on your XenDesktop virtual desktops and XenApp servers.

See:

- [Install RealTime Media Engine](#)
- [Install RealTime Connector](#)

Deploy HDX RealTime Media Engine to your users

Feb 11, 2015

You install HDX RealTime Media Engine on client devices. The media engine provides local media processing of audio/video calls and peer-to-peer communication with other callers using Microsoft Lync.

Your method for deploying HDX RealTime Media Engine to a user device depends on the operating system of the device:

- [Deploy HDX RealTime Media Engine to Windows devices](#)
- [Deploy HDX RealTime Media Engine to Linux terminal devices](#)

Deploy HDX RealTime Media Engine to Windows devices

Jan 06, 2015

Citrix HDX RealTime Connector requires the installation of HDX RealTime Media Engine on the host terminal device. This topic describes the steps for deploying HDX RealTime Media Engine to thin client terminals running Windows operating systems.

You can deploy HDX RealTime Media Engine to your users' Windows devices either with or without the use of Merchandising Server. This topic describes both methods of deployment.

Prerequisites

Before deploying HDX RealTime Media Engine to a Windows client device:

- Ensure that Citrix Receiver is installed on the user device and is able to connect through XenDesktop or to XenApp.
- If the device is using RAM disk, increase it to its maximum size.

To maximize RAM disk space

1. Log on to the device as a local administrator.
 - If there is a red ball (labeled FBWF) in the Windows notification area, skip to the next step. The write filter is disabled.
 - If there is a the green ball in the Windows notification area, click the green ball and choose DISABLE so that the ball turns red.
2. Restart your device and log on as a local administrator.
3. Open Control Panel > Ramdisk.
4. In the Ramdisk Configuration dialog box, increase the size of the RAM disk to the maximum amount.
5. Restart your device and Microsoft Lync if you are running it as a published application.

Important: When upgrading Citrix Receiver for Windows, the Lync Optimization Pack must be uninstalled first and then reinstalled after upgrading Citrix Receiver. Refer to [CTX200340](#) for additional details.

Deploying HDX RealTime Media Engine

After ensuring system requirements and prerequisites are met, you can deploy the media engine to your users by making the installer available from a flash drive, web page, or network drive.

1. Log on to the terminal or computer as a local administrator.
2. Run Citrix HDX RealTime Media Engine.msi. After accepting the terms of use, the installer runs silently.
3. Install a web camera on the device, following manufacturer's installation instructions.

Deploy HDX RealTime Media Engine to Linux terminal devices

Oct 10, 2014

HDX RealTime Connector requires the installation of Citrix HDX RealTime Media Engine on the terminal device. This section describes how to install the Media Engine for these Linux distributions:

- Fedora 16 (Verne) x86, RPM-based
- Ubuntu 11.10 (Oneiric Ocelot) x86-64, Debian-based

Prerequisites

Before deploying HDX RealTime Media Engine to a Linux terminal device running Ubuntu:

- If the Ubuntu system is newly installed, install all available updates from the Update Manager before proceeding.
- If the Ubuntu system does not have a directory called `/usr/lib32`, create it with this command: `sudo mkdir /usr/lib32`

To prepare terminals running Ubuntu for installation of HDX RealTime Media Engine

When performing the following steps, place all installation files in a directory, such as `/downloads`, and run commands in that directory.

1. Download the 64-bit Debian Citrix Receiver package from <http://www.citrix.com/English/ss/downloads/details.asp?downloadId=2316611&productId=1689163>. The download is under the heading For 64-bit Systems and is named `icaclient_12.0.0_amd64.deb`.
2. Download the RPM Open Motif version 2.3.3 package from <http://motif.ics.com/open-motif/download/openmotif-233-1e153i386rpm>. The file name is `openmotif-2.3.3-1.e15.3.i386.rpm`. The RPM package is necessary because there is no Debian package for version 2.3.3 of Open Motif.
3. Convert the Open Motif RPM package to a Debian package. For information, refer to steps 2b-2d in <http://support.citrix.com/article/CTX125285>.
4. Install these libraries required by Citrix Receiver:

```
sudo apt-get download libmotif4:i386 libxmu6:i386
sudo dpkg -x libmotif4* /tmp
sudo dpkg -x libxmu6* /tmp
sudo cp -r /tmp/usr/lib/* /usr/lib32/
```

The two `sudo dpkg` commands cause Linux to remove write privileges from both "group" and "user" for the `/tmp` directory. Be sure to reset privileges of `/tmp` back to 777 using this command: `sudo chmod 777/tmp`
5. Install the converted Open Motif package: `sudo dpkg -i openmotif_2.3.3-2_i386.deb`
6. Install the Citrix Receiver Debian package: `sudo dpkg -i icaclient_12.0.0_amd64.deb`
7. To fix any unresolved dependencies, run this command: `sudo apt-get install -f`
8. Verify that Citrix Receiver can connect through XenDesktop or to XenApp.
9. Go to "To run HDX RealTime Media Engine installation script," later in this topic.

To prepare terminals running Fedora for installation of HDX RealTime Media Engine

When performing the following steps, place all installation files in a directory, such as `/downloads`, and run commands in that directory.

1. Download the 64-bit RPM Citrix Receiver package from <http://www.citrix.com/English/ss/downloads/details.asp?downloadId=2316611&productId=1689163>. The download is under the heading For 64-bit Systems and is named ICAClient-12.0.0-0.x86_64.rpm.
2. Download the RPM Open Motif version 2.3.3 package from <http://motif.ics.com/open-motif/download/openmotif-233-1e153i386rpm>. The file name is openmotif-2.3.3-1.el5.3.i386.rpm.
3. Install Open Motif: `sudo yum install -y openmotif-2.3.3-1.el5.3.i386`
4. Install the Citrix Receiver package: `sudo yum install -y ICAClient-12.0.0-0.x86_64.rpm`
5. Remove the files from the /tmp directory using these commands:
`sudo rm -rf .X11-unix/`
`sudo rm -rf .ICE-unix/`
`sudo rm -rf .X0-unix/`
6. Verify that Citrix Receiver can connect through XenDesktop or to XenApp.
7. Continue with “To run HDX RealTime Media Engine installation script,” next.

To run HDX RealTime Media Engine installation script

The installation package for Citrix HDX RealTime Media Engine includes the following components. Use this package for both Ubuntu and Fedora. The software detects the type of Linux and installs the appropriate package.

- EULA.rtf
- HDXRTME_install.sh
- /i386 subdirectory containing the Debian and RPM packages:
 - citrix-hdx-realtime-media-engine-1.5.0-115_i386.deb
 - citrix-hdx-realtime-media-engine-1.5.0-115_i386.rpm

1. Place the entire installation package in the directory from which you are running commands.
2. At the prompt of the directory in which the software resides, enter `./HDXRTME_install.sh` and then follow the instructions provided by the script.
3. If you have Microsoft Lync running as a published application, restart it (Microsoft Lync).

Deploy HDX RealTime Media Engine 1.5 to Mac devices

Jan 06, 2015

HDX RealTime Connector for Microsoft Lync for Mac OS devices requires the installation of Citrix HDX RealTime Media Engine 1.5 on the client device. This section describes how to install the Media Engine on Mac OS devices.

Before running Citrix HDX RealTime Media Engine 1.5 installation script, ensure you have Receiver for Mac installed on the device.

The installation package for Citrix HDX RealTime Media Engine 1.5 includes the following components:

- Install HDXRealTimeMediaEngine.pkg
 - Uninstall HDXRealTimeMediaEngine
1. Log on to the Mac as an Administrator.
 2. Double-click the downloaded file, HDXRealTimeMediaEngine.dmg. The disk image mounts.
 3. To start the installation, double-click Install HDXRealTimeMediaEngine.pkg.
 4. Follow the instructions provided by the script.
 5. After the installation completes, confirm the installation: In the Mac System Preferences under Other, click Citrix HDX RealTime Media Engine to view the installed version.
 6. If you have Microsoft Lync running as a published application, restart it (Microsoft Lync).

Install HDX RealTime Connector for Microsoft Lync on your servers and VDAs

Feb 11, 2015

HDX RealTime Connector for Microsoft Lync enables optimized audio and video conferences. To make HDX RealTime Connector for Microsoft Lync available to your users in XenApp and XenDesktop environments, you install HDX RealTime Connector for Microsoft Lync on your XenApp servers and XenDesktop virtual desktops.

To install into a XenDesktop environment

Install HDX RealTime Connector for Microsoft Lync onto a XenDesktop virtual desktop you want to make available to your users. Before installation, ensure that Microsoft Lync is not running on the XenDesktop virtual desktop.

To install HDX RealTime Connector for Microsoft Lync:

1. Start a XenDesktop virtual desktop and log on as Administrator.
2. On the virtual desktop, run the installation wizard HDX RealTime Connector LC 2013.msi and follow the instructions.
3. Restart the virtual desktop.

To install into XenApp environment

Install HDX RealTime Connector for Microsoft Lync on each server in a XenApp farm where you want to make HDX RealTime available. Before installation, ensure the Microsoft Lync is not running in any sessions on the servers.

1. Log on to a XenApp server as Administrator.
2. Run the installation wizard HDX RealTime Connector LC 2013.msi and follow the instructions.
3. Restart the XenApp server.

Configure firewalls

Jan 07, 2015

With the HDX RealTime Optimization Pack for Microsoft Lync, the HDX RealTime Media Engine runs on the user device. The HDX RealTime Media Engine performs Signaling and Media transmission. To help you understand which ports are used by the HDX RealTime Media Engine for supporting external users, equate running the HDX RealTime Media Engine with running the Microsoft Lync client locally on the user device. The difference is XenApp and XenDesktop host the UI and business logic layers. Understanding that the media engine is running on the remote endpoint clarifies the port requirements.

External users outside of the corporate firewall connect to the Lync Edge Server, a component of Lync Server infrastructure that must be installed on a dual-homed server in the DMZ with connections to both the Internet and to the intranet. The port requirements are listed at: [http://technet.microsoft.com/en-us/library/gg425891\(v=ocs.14\).aspx](http://technet.microsoft.com/en-us/library/gg425891(v=ocs.14).aspx).

In addition to ports, configure external DNS to point to the Lync Edge Server from the Internet:

<http://technet.microsoft.com/en-us/library/gg412787%28v=ocs.14%29.aspx>

To find the Lync Edge Server, the HDX RealTime Media Engine follows the same procedures as the Lync client. See "How Lync Clients Locate Services" at <http://technet.microsoft.com/en-us/library/gg398758.aspx>

Internal users inside the corporate firewall connect directly to the Lync Server that runs inside the firewall. They also communicate point-to-point between other Lync clients during calls. If your company has internal firewalls, you must make sure that the proper ports are open to connect with the Lync Server and to transmit and receive media during calls. The port requirements are listed at: <http://technet.microsoft.com/en-us/library/gg398833%28v=ocs.14%29.aspx>.

Configure client devices for Dell RemoteScan

Jan 07, 2015

You can use Dell RemoteScan to initiate scans directly from your virtual desktop to any TWAIN or WIA compliant scanner. For more information, see <http://www.dell.com/us/business/p/dell-software-remotescan-enterprise/pdf>. To run Dell RemoteScan on client devices in XenDesktop or XenApp environments using Microsoft Lync with Citrix HDX RealTime Optimization Pack installed:

1. Close RemoteScan if it is running on the client.
2. Open RegEdit on client device and go to [HKEY_LOCAL_MACHINE]/SOFTWARE/Citrix/ICA client/Engine/configuration/Advanced/Modules/ICA 3.0.
3. Remove RSICAWorkStationProxy from the VirtualDriver key.
4. Add RSICAWorkStationProxy to the VirtualDriverEx key. Place it following all other virtual driver entries.
5. On the client device, edit c:\program files\remotescan server\server.ini and add the following entry in the [server] section:
noicaregistry=1
6. Start RemoteScan on the device.

Microsoft Lync MeetNow

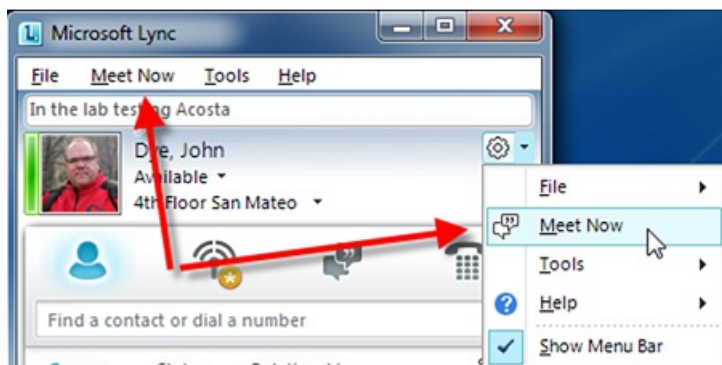
Oct 16, 2014

You can use Microsoft Lync MeetNow with the Citrix HDX RealTime Optimization Pack as follows.

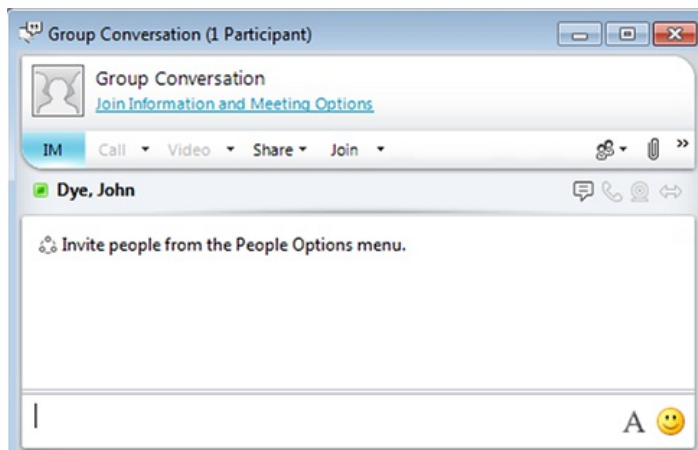
Start a conference

Start a MeetNow conference by:

- Clicking the Meet Now menu item.
- Clicking the Show menu down arrow and selecting Meet Now.



The following window appear:



Add users to the group conversation

Add users to the conversation by:

- Clicking the Conversation window icon.
- Selecting Invite More People in the Conversation window.

Join the audio and video portion of a conversation

To add the audio and video portion of a conversation while in the meeting:

- From the Conversation window, click **Join > Audio** or **Join > Video + Audio**.

Receive and accept an invitation

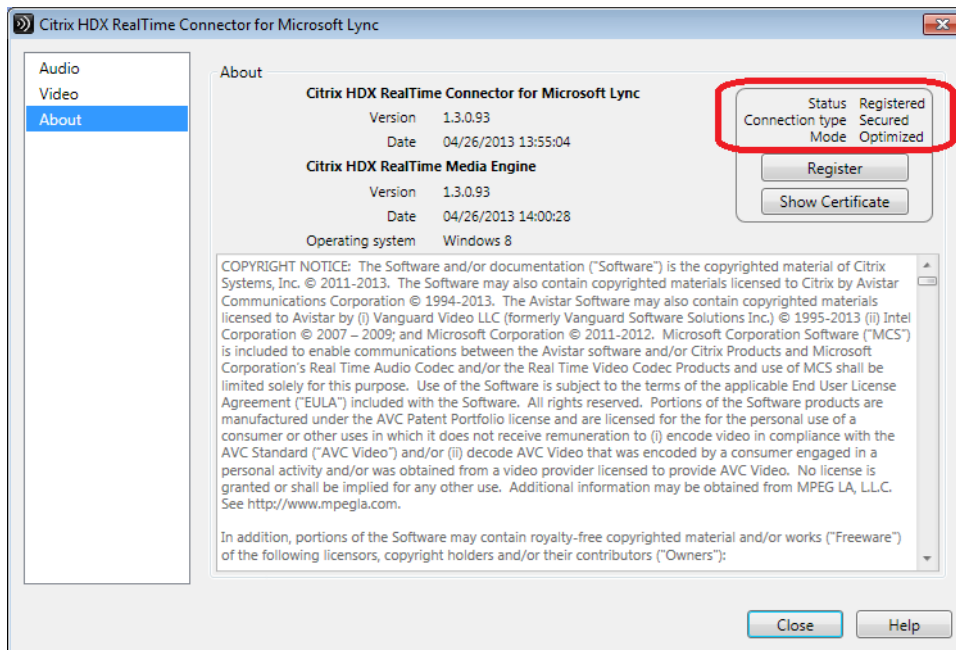
Receiving and accepting an invitation to a group conversation the same as handling any other incoming calls in Lync. Click the incoming call dialog to immediately join to the group conversation (including the audio and video portion).

Troubleshoot

Oct 27, 2015

You can verify your installation and collect troubleshooting information from your users through the following:

- Confirm audio and video device detection. On the user device, from the Lync tools menu, choose Tools > Audio Video Settings.
- Open the Lync **About** page and confirm connection attributes (status, connection type, and mode). The following screenshot shows the correct connection values.



If the HDX RealTime Connector for Microsoft Lync is in fallback or non-optimized mode, the value of the Mode field is Un-Optimized. For fallback mode, video and audio processing occurs on the server and the media is sent from the terminal to the server and then back to the terminal.

- During a call, you can view information about your network health by typing Alt-N. The Network Health window appears, as shown in the following example. Values in red indicate potential problems with the network. To write the values to a text file whose default name is call_statistics_<date>.txt, click Save Statistics.

	Audio	Video	Total
Receive Packets Lost (%)	0.27	0.27	0.27
Receive Packets Lost	3	3	6
Sent Packets Lost (%)	0.00	0.00	0.00
Sent Packets Lost	0	0	0
Late Packets (%)	0.00	0.00	0.00
Dropped Packets (%)	0.00	0.35	0.18
Skipped Frames (%)	0.09	2.53	0.86
Jitter Buffer Size(ms)	0	10	-
Average Data Sent (kb/s)	34	194	228
Average Data Received (kb/s)	0	230	230

	Sent	Received
Video Frame Rate	15.06	30.11
Video Resolution	352 x 288	704 x 528
Limited by	Bandwidth	Codec
Video Codec	RT Video	RT Video
Audio Codec	RT Audio	RT Audio

Buttons: Save Statistics, Close

Find log files

The HDX RealTime Connector for Microsoft Lync client application also writes logs to your XenApp or XenDesktop servers. You can find them in the following locations, depending on the client-side operating system.

- For Windows XP users: %Temp%\Citrix\RealTimeConnectorLC\MediaEngine\MediaEngineDebugLogs
- For Windows 7 users:
C:\Users\USERNAME\AppData\Local\Temp\Citrix\RealTimeConnectorLC\MediaEngine\MediaEngineDebugLogs
- For Windows 8 users:
C:\Users\USERNAME\AppData\Local\Temp\Citrix\HDXRTConnectorLC\MediaEngine\MediaEngineDebugLogs

MediaEngineHost.exe writes client-side error logs to %TEMP%\Citrix\RestrictedMediaEngine\ on the local terminal.

Determine whether your connection problems are related to DNS issues

If you have DNS problems on the terminal, these can cause the HDX RealTime Connector for Microsoft Lync and the Citrix HDX RealTime Media Engine to fail registration while the Lync application can register successfully. If this occurs, debug and fix the DNS problems from the remote terminal.

Save crash logs for Dell Wyse terminals

On Dell Wyse terminals, the log file of an application crash is not saved when the user works in User mode. To save crash logs, the user must work in Administrator mode. You can find crash logs in MS-RAMDRIVE, which is drive Z by default on Wyse terminals.

Change the location of Citrix HDX RealTime Media Engine error logs

Normally, the error logs from a client application are created on the local, client device. However, such local error logs are sometimes deleted when a terminal user logs off, so a system administrator is unable to retrieve them.

HDX RealTime Media Engine avoids this by writing error messages into the Media Engine error logs on the virtual desktop

running on the client device.

To change the write location of Media Engine Host error messages from the virtual desktop back to the local client device

1. In the registry of the remote desktop running on the client device, in `HKEY_CURRENT_USER\Software\Citrix\HDXRTConnectorLC\MediaEngine`, create a registry value of type `DWORD` named `EnableRemoteDebugLogging`.
2. Set the `EnableRemoteDebugLogging` value to 0.

To re-enable remote error message logging on the virtual desktop, set the value of the key to 1 (enabled) or remove the key entirely.

Limit the video frame rate for Citrix HDX RealTime Media Engine

If you are having video problems attributable to a high Frames Per Second (FPS) rate, such as the image breaking up, you can limit the supported FPS with this registry key value:

```
[HKEY_CURRENT_USER\Software\Citrix\HDXRTConnectorLC\MediaEngine]
"MaxAllowableFrameRate"="15".
```

Determine whether your firewall is blocking the HDX RealTime Connector for Microsoft Lync

The HDX RealTime Connector for Microsoft Lync can fail to initialize if a personal firewall blocks the network initialization for too long. This condition resolves itself the next time the program is run after you unblock the application.

When the firewall is blocked, an error message such as the following can appear:

- RealTime Connector is waiting for the connection from the Media Engine...
- Failed to maintain RealTime Connector on this device. Communication to the Media Engine was disrupted. Please contact your system administrator.

In such cases, create an exception in the Windows firewall.

Restore Lync to a normal size after starting a second session

Occasionally, when you start a second session on a second terminal while a first session remains open, Microsoft Lync does not open in the second session. It stays minimized in the task bar. To maximize it, right-click the task bar and select `Maximize`. Then, to restore Lync to a normal size, restart Lync.

Resolve an “Application Not Running” error in the App Center Console

The error `Application Not Running` can appear when a published application is closed. To resolve this issue, add `LyncMonitor.exe` to a registry key in the XenApp server. For information, refer to <http://support.citrix.com/article/CTX133328> and <http://support.citrix.com/article/CTX891671>.

Resolve video quality issues when using a wireless network connection

If you experience issues with video quality when using a wireless network connection, try moving closer to the wireless access point. If that does not resolve the issue, try a wired network connection instead. When using a wired network connection, disable the wireless network adapter to avoid transmission issues.

Install a root certificate for the RealTime Media Engine on Windows terminals

Certain Windows terminals do not include a VeriSign root certificate for RealTime Media Engine in the default set of trusted root certificates. If a terminal does not have the required certificate, these issues appear immediately after Lync

starts:

- Lync does not connect to RealTime Media Engine.
- The camera preview does not work.
- The HDX RealTime Connector for Microsoft Lync program information page does not include an entry for RealTime Media Engine.
- The terminal error log includes the following entry: Media Engine package search failure. It is impossible to launch MediaEngineHost.

For more information about root certificate issues, refer to the following articles:

- <http://support.citrix.com/article/CTX129998>
- <https://knowledge.verisign.com/support/code-signing-support/index?page=content&actp=CROSSLINK&id=AD220>
- <https://knowledge.verisign.com/support/code-signing-support/index?page=content&actp=CROSSLINK&id=SO14649>

Obtain a root certificate.

1. Go to <https://www.verisign.com/support/roots.html>.
2. Under VeriSign Root Package, click Download a root package to download the roots.zip archive.
3. Extract files from the roots.zip archive to the Windows terminal.

Install the root certificate manually or through the Microsoft Management Console (MMC).

- To perform a manual installation:
 1. From the Windows terminal, navigate to the \roots folder containing the extracted files and then open the folder Verisign Root Certificates > Generation 5 (G5) PCA.
 2. In that folder, right-click VeriSign Class 3 Public Primary Certification Authority - G5.cer and then click Install Certificate.
 3. Scroll below the Security Warning to open the Certificate Import wizard and then click Next.
 4. On the Certificate Store wizard page, click Place all certificates in the following store and then click Browse.
 5. In the Select Certificate Store dialog box, select the Show physical stores check box.
 6. Open the Trusted Root Certification Authorities folder, select Local Computer, and then click OK.
 7. Click Next, review your settings, and then click Finish.
- To perform the installation with the MMC:
 1. From the Windows terminal, click Start and then type run.
 2. In the Run field, type mmc to open the terminal Console.
 3. In the Console File menu, select Add/Remove Snap-in.
 4. In the Add/Remove Snap-in dialog box, click Add.
 5. Select Certificates and then click Add.
 6. Select Computer Account and then click Next.
 7. Select Local computer and then click Finish.

Resolve installation issues

For software in general, the most common installation problems are related to corrupt system files needed for installation. These errors are rare, but difficult to troubleshoot.

The Media Engine installer requires Microsoft .NET 3.5.1. If it is missing from the computer, install it to resolve the problem. If it is already installed, run a repair installation on .NET.

On some Windows machines, customers encounter errors during software installation when embedded custom-action VB scripts run. Common errors presented to the user or captured in install logs are 2738 and 1720. Some customers have encountered these errors when an anti-virus program places the vbscript.dll ClassID under the HKEY_CURRENT_USER registry hive instead of under HKEY_LOCAL_MACHINE where it is needed for the proper elevated run level.

Run the following registry queries to determine if the vbscript.dll ClassID is installed for the current user, system wide, or both:

- % reg query HKEY_CURRENT_USER\SOFTWARE\Classes\CLSID{B54F3741-5B07-11CF-A4B0-00AA004A55E8}
- % reg query HKEY_LOCAL_MACHINE\SOFTWARE\Classes\CLSID{B54F3741-5B07-11CF-A4B0-00AA004A55E8}

The ClassID should appear only for HKEY_LOCAL_MACHINE. If it is under HKEY_CURRENT_USER, follow these steps. If ClassID is under HKEY_LOCAL_MACHINE and not HKEY_CURRENT_USER, start with step 2.

1. Run an anti-virus clean-up utility:

1. If the terminal has an anti-virus program installed and the vendor has a clean-up utility, run the clean-up utility.
2. Re-run the Media Engine installer MSI.
3. If the issue persists, go to the next step.

2. Register vbscript.dll:

The vbscript.dll file or registry reference to its ClassID can become unregistered or corrupted. Follow these steps to register or repair it.

1. Run CMD.exe as an administrator: Click Start, type cmd, right-click cmd, and click Run as administrator.
2. Enter in the Command window:
 - For the 32-bit version of Windows: cd %windir%\system32
 - For the 64-bit version of Windows: cd %windir%\syswow64

3. Enter in the Command window: regsvr32 vbscript.dll

4. Re-run the Media Engine installer MSI.
5. If the issue persists, go to the next step.

3. Remove the vbscript.dll ClassID:

1. In the Registry Editor, locate and remove registry key HKEY_Current_User\SOFTWARE\Classes\CLSID{B54F3741-5B07-11CF-A4B0-00AA004A55E8}.
2. Click Start > Control Panel, navigate to the User Account Control Settings, and then move the slider to Never notify. After you complete the troubleshooting, you can revert this change if needed.

3. Re-run the Media Engine installer MSI.
4. If the issue persists, go to the next step.

4. Repair corrupt system files with System File Checker:

1. Run CMD.exe as an administrator: Click Start, type cmd, right-click cmd, and click Run as administrator.
2. In the Command window, enter: sfc /scannow
3. Re-run the Media Engine installer MSI.
4. If the issue persists, go to the next step.

5. Restore corrupt registry entries to their original state:

1. Restart the Windows terminal and during the restart, insert the OS installation DVD to boot from it. The OS installation DVD must match the Windows service pack installed on the terminal.
2. Follow the installation steps, selecting the option to repair the OS.
3. Re-run the Media Engine installer MSI.