Dragon Medical One 2024.2

Audio Routing Guide

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Overview

For accurate speech recognition, Dragon Medical One must capture clear audio from the user's device. To achieve this in a virtualized environment, it requires the following considerations:

- The client workstation, where the user is dictating, is not running a locally-installed instance of Dragon Medical One or the EMR. The apps are running on a virtualization server or virtual desktop. The workstation displays a bitmap representation of the apps or virtual desktop via a receiver app.
- Dragon Medical One must be installed on the same server or virtual desktop as the EMR to be able to access the EMR's text fields.
- Button controls and high-quality audio must be routed from the workstation where the PowerMic is connected to the virtualization layer where Dragon Medical One and the EMR are running.

This guide summarizes the types of virtualized environments at customer sites and the available Nuance solutions. It helps Nuance customer-facing personnel to recommend the best solution for each customer's configuration.

Note: Many sites install Dragon Medical One locally in addition to a virtual configuration; local installations aren't the primary focus of this document.

System configurations

Dragon Medical One and the EMR can be hosted on a virtualization server (for example, Citrix XenApp) or included in a virtual desktop image running on a virtualization server (for example, Citrix XenDesktop).

The workstation can be a thick client running a full Windows version, a thin client running Linux or Windows Embedded or a zero client with no operating system.

A site's configuration might include a virtualization vendor for which Nuance provides custom channels (Citrix, VMware); this affects the choice of solution for the site.

A customer might use more than one of these configurations. Therefore, more than one Nuance solution might be needed to fulfill a site's requirements.

Single-hop virtualization

Dragon Medical One and the EMR are hosted on a virtualization server or included in a virtual desktop. The apps/virtual desktop are streamed to the user's workstation. Audio and microphone buttons must be routed from the workstation to the virtualization server/virtual desktop where Dragon Medical One and the EMR are installed.
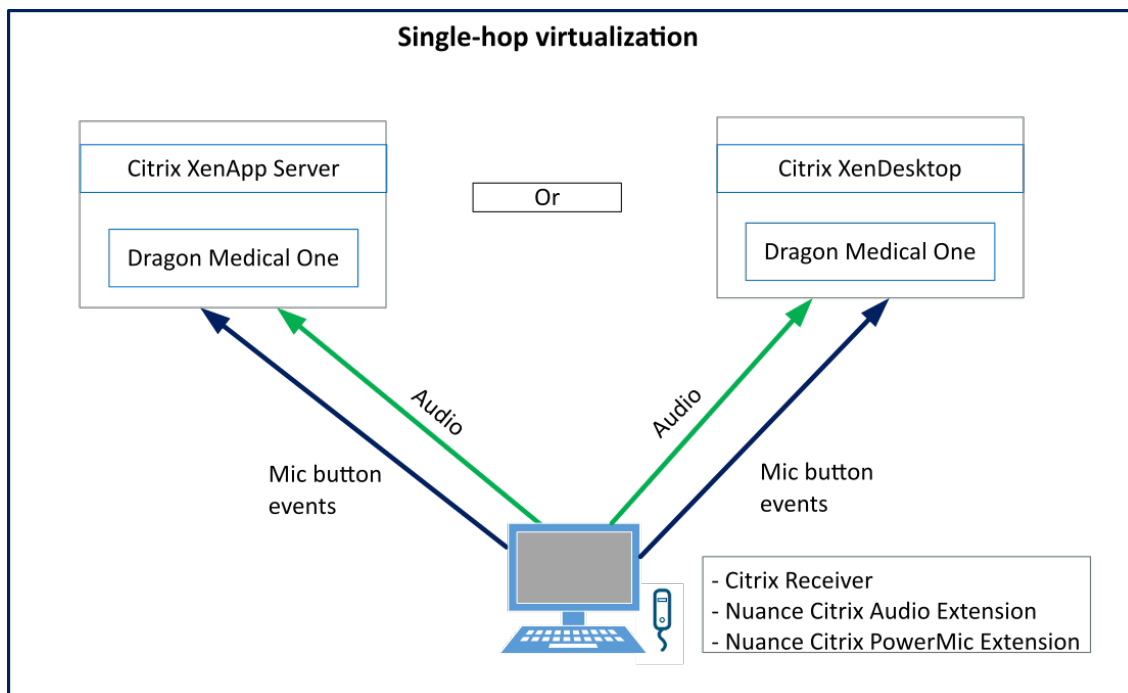
Double-hop virtualization

A double-hop configuration is most common when a site accesses an EMR hosted by the EMR vendor (for example, Cerner) and also uses a desktop virtualization solution such as XenDesktop. In this configuration, Dragon Medical One is hosted with the EMR. Audio and microphone buttons must be routed through two virtualization layers or delivered via an alternative route that bypasses the intermediate virtualization layer.
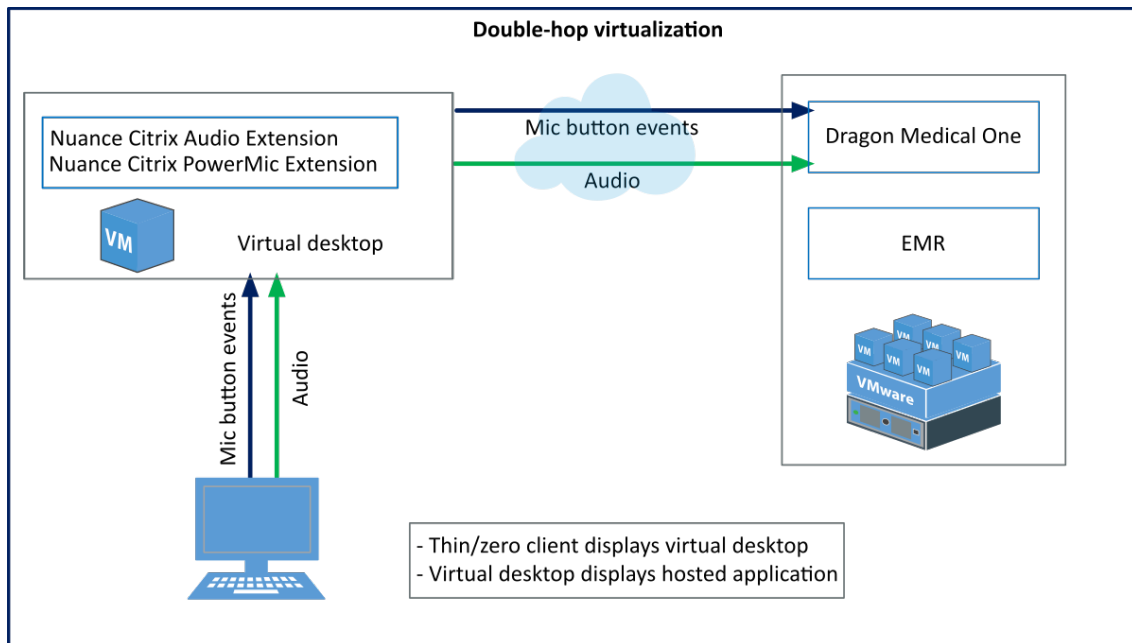
For more information on double-hop configuration for Citrix and VMware environments, see *Nuance - Double Hop Configuration for Citrix Environments* included in the Nuance virtual extensions package.

Available solutions

PowerMic Mobile

PowerMic Mobile is an iOS and Android app that routes audio and button controls from a smartphone to Dragon Medical One via a secure internet connection. This works independently from the virtualization technology and bypasses the intermediate virtualization layer in a double-hop configuration. Because no additional software needs to be installed on the client workstation, this is the only Nuance solution that works with zero clients.

To use PowerMic Mobile, the user logs in to the mobile app and Dragon Medical One with the same user name. The user name can be defined in the site's authentication infrastructure or in the Nuance Management Server (NMS), explicitly for use with PowerMic Mobile. A Nuance-hosted component, the PowerMic Mobile Server, pairs PowerMic Mobile with the Dragon Medical One instance based on the matching user name. Once the two apps are paired, the audio and button controls are delivered from PowerMic Mobile to Dragon Medical One via the PowerMic Mobile Server.

PowerMic Mobile provides the following additional benefits:

- The site doesn't need to purchase and install hardware PowerMics.
- Users can bring their own mobile devices or the site can provide shared devices.
- PowerMic Mobile can be used on site and remotely, when a network connection is available.

The following diagram illustrates the PowerMic Mobile architecture and workflow:
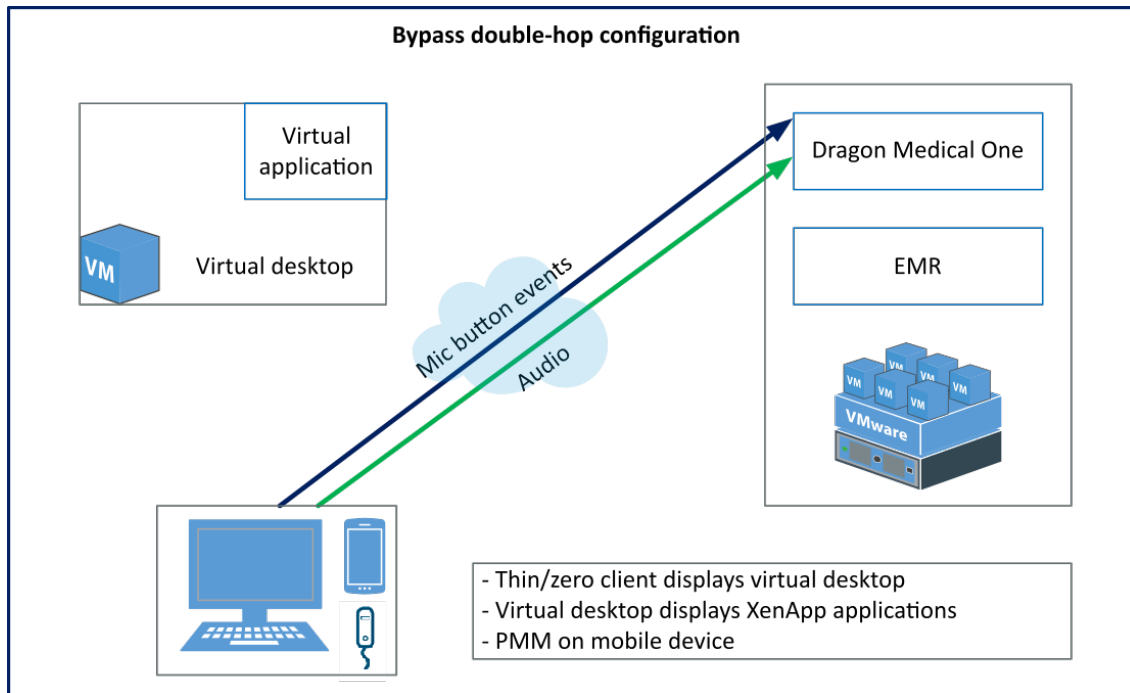
Nuance virtual extensions

The Nuance Citrix and VMware audio extensions and PowerMic extensions provide custom audio and microphone button channels for the following products:

- Citrix XenApp and XenDesktop/Citrix Virtual Apps and Desktops
- VMware Horizon View
- Microsoft Windows 10 and Windows Embedded operating systems
- Linux thin clients (for more information on thin clients supporting device splitting, contact your vendor)
- The following speech recognition apps:

    Dragon Medical One
    Apps based on Dragon Medical SpeechKit (.NET and COM editions)

Audio extensions

The Nuance Citrix/VMware audio extensions reduce the bandwidth required to transfer audio data from the client workstation to the server/virtual desktop where Dragon Medical One is installed. Native audio channels can require up to 1.4 Mbit/s bandwidth between the client workstation and the hosted app. The Nuance audio extensions require 27 kbit/s. This enables

Nuance to offer compatibility with the most common virtualization solutions while at the same time delivering industry-leading speech recognition accuracy.

The Nuance audio extension is only installed on the client workstation (client end point).

PowerMic extensions

Microphone buttons, sliders and other controls must be routed to Dragon Medical One separately from audio. To enable this for the PowerMic in a Citrix XenApp/XenDesktop or VMware system, the Nuance PowerMic extensions provide a custom channel for PowerMic button controls.

The Nuance PowerMic extension is only installed on the client workstation (client end point).

Vendor native audio channels

Important: To use PowerMic buttons, you need to configure device splitting (available for Citrix and VMware environments, Windows client end points and some Linux-based clients). For more information on thin clients supporting device splitting, contact your vendor.

Citrix HDX

Citrix HDX audio channel (Citrix optimized virtual channel) redirects audio data to the virtual desktop at a significantly lower bandwidth than regular USB redirection.

VMware RTAV

VMware Horizon View Real Time Audio and Video (RTAV) redirects audio and video data to the virtual desktop at a significantly lower bandwidth than regular USB redirection.

Limitations

If you use native audio channels instead of the Nuance audio extensions, you might experience the following limitations:

- The bandwidth increases from 28 kbit/s to 150 kbit/s or higher.
- The microphone input volume can't be changed on the client end point; this might lead to audio gaps if the volume isn't configured correctly.

- Automatic gain control (AGC) and voice activity detection (VAD) aren't available.

- Controlling the client end point isn't possible (for example, disabling the screen saver during recording or disabling the buttons/stopping recording when the screen is locked).

- In standby mode, the audio data are streamed continuously from the client end point to the server or virtual desktop. When recording is on, audio data are also streamed even if the user isn't speaking.

- If Citrix HDX is used in combination with USB device splitting, each time a user roams to another client end point, they must manually select the HID device they want to redirect to be able to use the microphone buttons.

USB redirection

Citrix XenApp/XenDesktop 7.15+ and VMware View 7.6+ can redirect the USB device from the client workstation to the server/virtual desktop. PowerMic bandwidth consumption via USB redirection is approximately 440 kbit/s in Citrix environments and approximately 1 Mbit/s in other virtual environments. There can be limitations depending on the virtualization platform and version used by a site. For example, VMware Remote Desktop Services Host (RDSH) doesn't support USB redirection on the server side.

Note: We don't recommend using USB redirection because it depends on the state of the network and is therefore unreliable. In addition, some devices require a high network throughput even when they're idle. Audio devices work better with the native audio channel.

Use native audio channels and device splitting in the following cases:

- When using a PowerMic with a zero client or with a thin client not supported by the Nuance virtual extensions.

- When using a double-hop configuration.

Recommendations

Note: More than one Nuance solution might be needed to fulfill a given site's requirements.

Zero clients

Recommended solution: PowerMic Mobile.

- Doesn't need additional software to be installed on the client workstation.
- Doesn't need hardware to be connected to the client workstation.
- The audio is compressed to optimize network bandwidth and encrypted for security.

Alternative solution: Vendor native audio channel.

- Should only be considered if the site needs to use PowerMic or composite devices from other microphone vendors.
- Doesn't need additional software to be installed on the client workstation.
- The audio is compressed to optimize network bandwidth and encrypted for security (if enabled).

Remarks

- Nuance virtual extensions can't be installed on zero clients.

Single-hop configuration (thin or thick clients)

Recommended solutions:

- Nuance virtual extensions if the site uses a supported virtualization vendor.
- Vendor native audio channel if the virtualization vendor isn't supported by the Nuance virtual extensions.

Alternative solution: PowerMic Mobile if the site wants increased mobility or doesn't want to purchase PowerMics for all workstations.

Double-hop configuration (thin or thick clients)

Recommended solutions: Combination of vendor native audio channel and Nuance virtual extensions.

Alternative solution: PowerMic Mobile if the site wants increased mobility or doesn't want to purchase PowerMics for all workstations.

Recommendations overview

Technology	Bandwidth	Recommended for
Nuance virtual extensions	27 kbit/s	Microsoft Windows and Windows Embedded operating systems Igel thin clients
PowerMic Mobile	27 kbit/s	Thin and zero clients Double-hop configuration
Citrix HDX	Approximately 150 kbit/s	Microsoft Windows operating systems Thin and zero clients **Note:** We recommend setting the audio quality option to **High** for optimal speech recognition quality.
VMware RTAV	> 200 kbit/s (depends on the VMware settings)	Microsoft Windows operating systems Thin and zero clients
Citrix USB audio	500 – 1000 kbit/s	Microsoft Windows operating systems Thin and zero clients
VMware USB audio	500 – 1000 kbit/s	Microsoft Windows operating systems Thin and zero clients

References

For more information, see the following:

- *Nuance - Deployment and Configuration for Citrix Environments*

- *Nuance - Deployment and Configuration for VMware Horizon View Environments*

- *Nuance - Deployment and Configuration for Microsoft RDS Environments*

- *PowerMic Mobile Installation and Administration Guide* (for on-premises installations)

- IGEL Knowledge Base