

Network guidelines

Dragon Medical SpeechKit provides cloud-based, real-time speech recognition. It can be used over any network connection: wired, WiFi or 3G/4G cellular networks.

The user's speech is recognized once the audio data has been successfully transmitted to the Dragon Medical system via secure Internet connection. This means that the user experience is affected by the quality of the network connection.

Network bandwidth, network latency and background noise are likely to have an impact on a user's speech recognition experience.

This chapter provides guidelines on the minimum network requirements for optimal user experience. Acceptable performance is often dependent on the user's perception and expectations vary from user to user. Note that the quality of a network connection cannot be consistently guaranteed over time - a connection that is good one minute can degrade the next, especially if the user is mobile and roaming between WiFi and/or cellular towers.

Performance optimization

The following features are designed to optimize network-based speech performance:

- **Audio compression:** Dragon Medical uses a lossy codec to minimize bandwidth requirements while retaining the high quality audio that is required for speech recognition. Audio transmission from a client to the Dragon Medical system requires 10 kB/sec; results returned from the Dragon Medical system to the client require approximately 2 kB/sec. If text-to-speech is used, audio streamed from the Dragon Medical system to the client will also require approximately 8 kB/sec.
- **Audio chunks and silence detection:** Audio is streamed to the server in small blocks to increase responsiveness. Data is transferred only when audio is being recorded; users who are not currently dictating do not consume network bandwidth.
- **SpeakAhead:** Nuance has implemented SpeakAhead technology which enables the user to continue dictating while the system compensates for network latency. The recognized text is, asynchronously, written in the field that it was originally dictated for.

Network bandwidth

A user needs 10 kB/sec total bandwidth upstream and 2-8 kB/sec downstream. This means that the network bandwidth requirements per user are minimal. Network connections are often shared and mobile users often utilize multiple network connections as they roam from a hospital network to a 3G/4G cellular tower to a home or public WiFi network.

To test individual connection speed we recommend using a standard tool such as <http://speedtest.net>. Mobile users can utilize the native applications for [iPhone](#) and [Android](#).

The quality of a network connection is not consistently guaranteed, especially for mobile users. In particular, consider the following:

- iPhone devices use a weak/poor WiFi connection for data services even in the presence of a strong 3G/4G signal.
- A strong 3G/4G signal does not guarantee a high bandwidth connection.

Network latency

Network bandwidth is not the only factor in optimal speech recognition. Due to our bandwidth-consumption optimization, network latency can often play a role in the user's perception of performance.

In general, the Dragon Medical system converts audio to text in real time; this means one second of audio is converted to text in one second or less. In order to provide near real-time results to the user, audio is streamed in small chunks. Network latency is overhead that adds directly to the time it takes the user to see the results.

Network performance tools, such as Speedtest.net, report latency based on a ping of the geographically closest server. However, since this does not report the latency between the user's device and the Dragon Medical system, this data is of limited value. If a general speed test reveals high network latency, it is possible that the network connection in general is poor and the user might experience delayed results. However, low reported network latency, from a general speed test tool, does not guarantee the network path to the Dragon Medical system will also exhibit low latency.

To accurately measure network latency from a desktop device to the Dragon Medical system, use the following command line tool: **tracert speechanywhere.nuancehdp.com**

Note: Nuance servers do not reply to pings; it is therefore normal to receive 'request timed out' messages on the last hop of the traceroute.

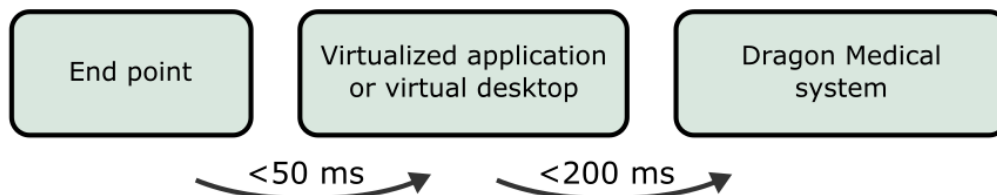
To accurately measure network latency from a mobile device to the Dragon Medical system, use an app that performs a similar traceroute function, such as [iNetTools](#) for iOS and [traceroute](#) for Android.

The quality of network connections, especially for mobile users is not consistent. A one-time check of network latency does not guarantee continued optimal performance.

Acceptable performance is often dependent on the user's perception and expectations vary from user to user. If the user is experiencing high latency, our SpeakAhead feature enables the user to continue dictating while results are processed asynchronously. However, users can grow impatient or frustrated waiting for results.

High level guidelines for network latency:

Network latency requirements

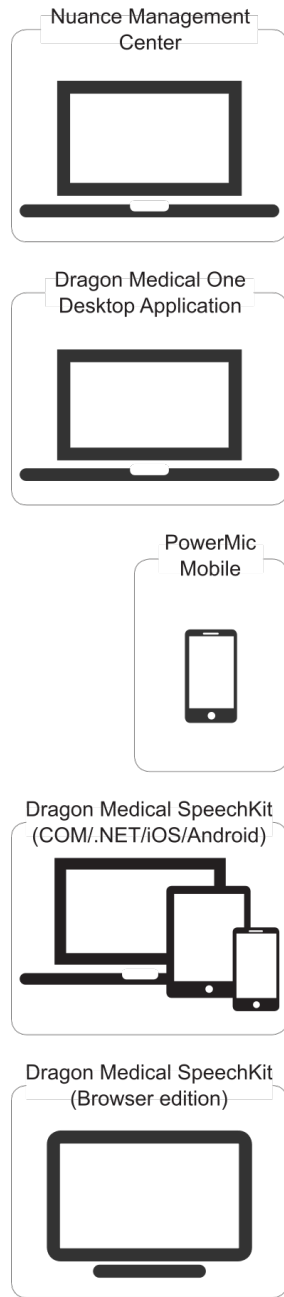


Servers and Ports

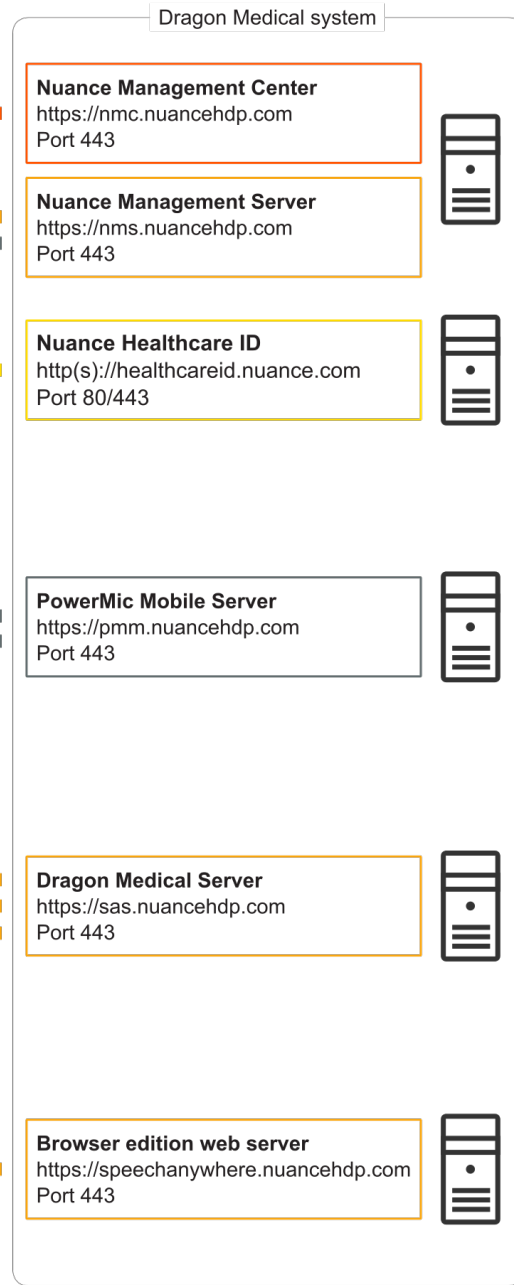
Be aware that some of the URLs below are aliases that resolve to multiple resources in different data centers. Therefore, it is important to check your network configuration.

Service	URL	Port	Relevant for:
Dragon Medical Server	https://sas.nuancehdp.com	443	Dragon Medical One Desktop Application Dragon Medical SpeechKit (all editions)
Nuance Management Server	https://nms.nuancehdp.com	443	Dragon Medical One Desktop Application PowerMic Mobile
	https://nmc.nuancehdp.com	443	Nuance Management Center
Nuance Healthcare ID	http(s)://healthcareid.nuance.com	80/443	Dragon Medical One Desktop Application
PowerMic Mobile Hub	https://pmm.nuancehdp.com	443	Dragon Medical One Desktop Application PowerMic Mobile
Browser edition web server	https://speechanywhere.nuancehdp.com	443	Dragon Medical SpeechKit (Browser edition)

Client components



Server components



- Core speech recognition features
- Nuance Healthcare ID
- PowerMic Mobile
- Nuance Management Center