

# iCap Bandwidth Usage and Latency Considerations

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**What is the idle bandwidth for an encoder not currently in use but polling for new captioners joining?**

Less than 5 kb/s.

**What is the bandwidth for an encoder transmitting one channel of standard iCap encrypted and compressed audio data (or a captioner or monitor receiving the data)?**

About 100 kb/s.

**What is the bandwidth for transmitting or receiving standard iCap Video data (available as part of the Broadcast Plus subscription package)?**

Video adds about 500 kb/s. This is at the standard rate of HD491 and HD492 encoders, which send 1-5 frames per second. The frames are designed to clearly show on-screen graphics, but action will generally not look smooth at this frame rate. The compromise is intended to preserve reliable low-latency performance even on limited network connections. Note that the caption monitoring overlay seen by the transcriber is produced locally at up to 30 frames per second and will scroll smoothly despite the limited video frame rate.

**What is the latency of the audio and video monitoring received over iCap?**

The audio latency for remote iCap transcribers will generally fall in a range from about 250 milliseconds to 500 milliseconds. Precise times depend on the listener's local buffer settings, and also may vary slightly with the ping time between the captioner, encoder source, and iCap reflection server.

iCap audio is sent over UDP with limited buffering and retransmission options. The iCap audio latency will never stack up over the course of a program as it would with some other technologies. However, iCap may be more sensitive than some types of less real-time applications to short bursts of congestion or high latency on a network.

**Is iCap Audio latency affected by use of iCap Video?**

No, as long as there is sufficient bandwidth to support the video service at all, there is no direct connection between the video and audio delay. The streams are encoded, transmitted, buffered, and rendered separately.

**Will increased bandwidth improve iCap audio performance?**

iCap uses a relatively small amount of bandwidth per stream but needs to have access to that bandwidth very reliably in order to see optimal performance.

When customers have a problem with iCap audio quality, most commonly the issue is with short term bouts of packet latency or poor connection quality related to other software or devices temporarily congesting the network. Many common applications, especially ones that transfer large files, have a "bursty" usage profile, and this can cause temporary and unpredictable problems for more real-time applications like iCap.

In a larger managed network, implementing a form of QoS for traffic from iCap encoders may be a good idea to ensure optimal service.