

Volume

2

BF TECHNOLOGIES

AccessVideo™ Client User's Manual

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BF TECHNOLOGIES, INC.

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1 – Overview

The AccessVideo™ system is a complete mobile turnkey telemedicine Video/IP remote diagnostic system. It employs state-of-the-art MPEG-4 and Windows Media 9 video compression alongside BF Technologies' proprietary ClearAccessQoS™ advanced Quality of Service (QoS) technology to facilitate remote medical diagnoses by capturing and delivering live, high-quality video and audio signals across Internet connections.

The AccessVideo system implements HIPAA compliance through the use of industry standards for strong conditional access and encryption to maintain the privacy and security and integrity of the video connection. It incorporates a powerful remote Pan/Tilt/Zoom interface to give a remote user full control over the transmitted image. A client-side recording capability precisely captures and archives audio and video streams for future reference and study. ClearAccessQoS™ helps insure jitter-free, clear video even through network congestion.

The AccessVideo system is built around a flexible yet compact platform, enabling it to capture, transport, and render a wide variety of telemedical real-time images and sensory data in addition to its audio and video capabilities. Its design allows operation over a wide variety of standard Internet connections, including wireless links as low as 96 Kbps, to provide the best quality video that current video compression technologies allow.

The AccessVideo encoder is built around the modular Microsoft DirectX™ system, allowing future software upgrades as new compression technologies become available. The AccessVideo system works in conjunction with current firewall systems, thereby aiding security and network protection. It requires no special client-side setup and only minimal server-side configuration.

The AccessVideo system provides asymmetric bi-directional video and audio transmission and can be configured for a wide variety of compression rates and technologies independently for each data direction.

The AccessVideo system has been field tested and proven in live emergency room deployments that include including IRB (institutional review board) certifications. The AccessVideo system has been developed to comply with NIH protocols for remote telemedical stroke diagnosis.

2 - Installation

The AccessVideo™ telemedical videoconferencing system has been designed for quick installation on a wide variety of PC platforms running Microsoft Windows® 2000 or XP operating systems. This section will help you determine if your system meets the minimal installation requirements and help guide you through the installation process.

Minimum System Requirements

CPU: Intel® Pentium® 4, Pentium® M, or Celeron® running at 1 GHz or faster

DRAM: 256 Megabytes or more

Required Disk Space: 10 Megabytes

Audio capture and playback capability

Optional video capture or USB port for video camera

Operating System: Microsoft Windows® 2000 or Windows® XP

Multimedia Software: Microsoft DirectX® 9.0c or newer and Windows Media Player 10. (Both packages are available as an update option as part of the Microsoft Windows update from windowsupdate.microsoft.com when choosing the “Custom” option.)

Although the AccessVideo™ client may run on a system without the minimum requirements listed above, such as a slower system, one with a different CPU, or older DirectX software, BF Technologies has not tested other such configurations for compatibility, robustness, or reliability. However, when running the AccessVideo client, the status bar will continuously display CPU utilization as one means of measuring whether the system is keeping up with the processing requirements.

Installing the Application

BF Technologies makes the AccessVideo client software available in a variety of forms: via e-mail attachment, FTP download, flash stick, CD-ROM, or pre-installed. Except for pre-installed software, installation consists of installing two packages: AccessVideo-XXX.msi and Common-XXX.msi, where XXX denotes the build number (407 as of the time this manual was written). Note that these MSI files may be delivered as a single ZIP archive, in which case, you must first unzip these files to extract them.)

We strongly recommend that you update your operating system to use the latest patches offered by Microsoft. In particular, updating to the latest DirectX® 9.0c (or later) and Windows Media Player 10 packages will help insure the best possible video and audio quality.

Step 1. If you received a ZIP file, extract the AccessVideo-XXX.msi and Common-XXX.msi files. You can extract these files to any convenient directory and delete them after installation to save disk space. We recommend that you keep the original ZIP file in a safe place for backup purposes.

Step 2. Double-click on Common-XXX.msi and follow the directions to finish the installation. You can select the installation directory, but we recommend that you use the default installation directory for ease of support.

Step 3. Double-click and complete the installation of AccessVideo-XXX.msi. You **MUST** use the same installation directory as in Step 2.

After completing this procedure, you should see an AccessVideo icon on your desktop. Double-clicking this icon will start the client application.

Registration and Activation

The AccessVideo client application comes with a free 10-day demonstration license to give you sufficient time to evaluate the performance of your particular computer system for compatibility with this software. If you determine that the computer onto which you had installed the AccessVideo application is compatible with the software and is adequate for producing satisfactory audio and video we recommend that you register your copy of the AccessVideo software to avoid a disruption in use. The software will **NOT** run after 10 days unless you register your copy of the software on the computer you have installed it on.

To register the software, click on the menu item: Help/Register. If you are not yet registered, a panel will pop open displaying your computer's identification number. Please e-mail this number to info@bf-technologies.com or call us to arrange for us to provide you with a license key. Usually, we provide the license key via e-mail. You can simply copy and paste the license key into the "License Key" box in the "AccessVideo Registration" panel and click OK to complete the registration process.

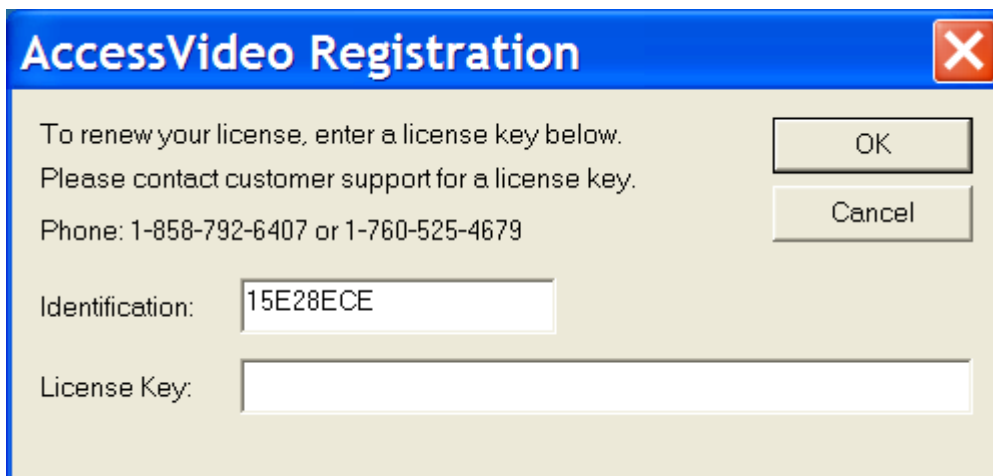


FIGURE 1. Screen snapshot of *AccessVideo Registration* panel.

Computer Settings

The following settings will help insure optimal performance.

- **SCREEN SAVER** should be disabled or set to a long enough interval so as to not interrupt session: right-click on screen background; click *properties*; click *Screen Saver* tab; either increase *wait* time as desired or select (*None*) screen saver.
- If using a microphone connected to the *mic input*, then the microphone must be selected as the **AUDIO INPUT DEVICE**: click *Start / Control Panel*; double-click on *Sounds and Audio Devices*; select *Audio* device; make certain that under *Sound recording* the correct *default device* is selected, especially if a USB video camera having a mic is plugged in; click on *Volume...*; select microphone and adjust volume. Mic volume can be adjusted while application is started.
- Make certain that speakers are connected and set to the proper volume. Bring up *Sounds and Audio Devices* panel as described above to adjust volume under the *Sound playback* section of that panel.

3 - Application Setup

To bring up the application setup panel, click on the *Settings...* option under the *File* menu. The options you see on this panel (Figure 2) provide general defaults and video and connection characteristics that apply to the setup of all links.

Target Response Time

The *Target Response Time* lets AccessVideo™ know what the maximum total round-trip signal delay that you are willing to allow to help it optimize signal robustness. A smaller value provides a faster, interactive conferencing experience, but at the expense of making the connection more susceptible to Internet interference and data loss. Conversely, a larger value provides for a more robust signal, but with longer delays. You specify the total response time in milliseconds. The minimum value is 400 ms (0.4 seconds) in order to account for encoding and synchronization delays (100 milliseconds for encoding in each direction and 100 milliseconds of synchronization buffering in each direction to account for clock frequency drift). This is a target value only. The AccessVideo™ attempts to honor this constraint, but if FEC or ARQ is checked (see below), AccessVideo™ may add additional latency to provide a basic level of service quality protections.

Synchronization Drift / Capture Jitter Tolerance

Synchronization Drift and Capture Jitter Tolerance adds this amount of initial jitter buffering to a connection to account for variations in video capture timing and network clock synchronization.

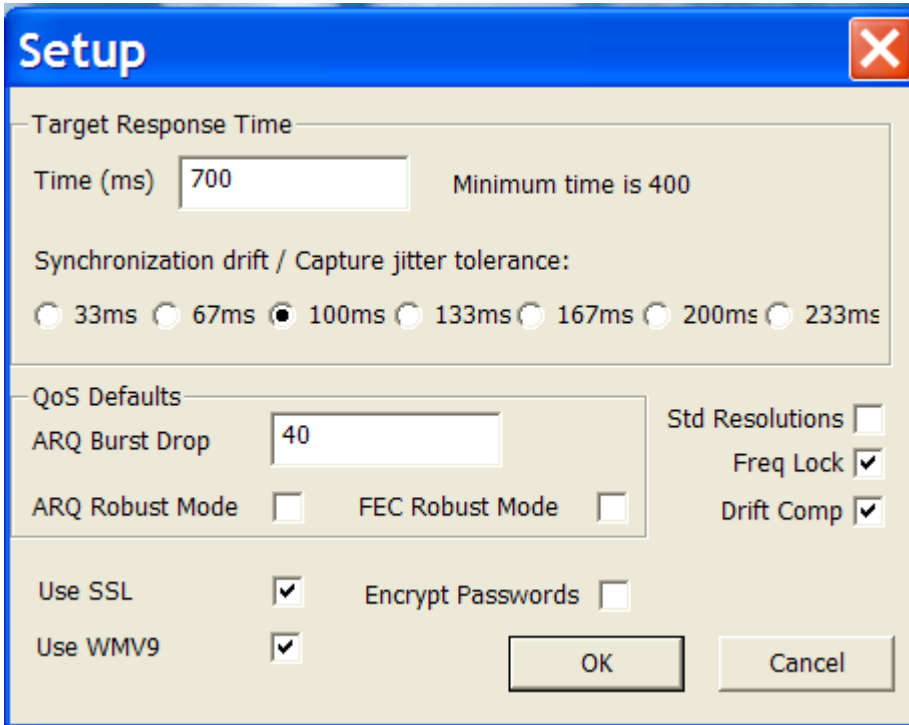


FIGURE 2. AccessVideo™ setup panel.

Quality-of-Service (QoS) Defaults

BF Technologies' AccessVideo™ technology incorporates two different and complementary error correction mechanisms: *Forward Error Correction (FEC)*, and *Automatic Repeat reQuest (ARQ)*. Settings under the QoS Defaults box provide initial default values for AccessVideo™ FEC and ARQ error correction. However, these settings can be over-ridden under the settings for each individual connection.

Clicking *Robust Mode* for a particular error correction mechanism biases the automatic configuration of that setting towards a more robust, error-free connection at the expense of longer latency and delay. For ARQ error correction, AccessVideo automatically adjusts and adapts the ARQ parameters to the current network conditions. To understand the advantages and disadvantages of these two error correction mechanisms and to learn when and how to adjust each of these mechanisms, please see the AccessVideo section in the **Adding Connections** chapter, below.

ARQ detects when a packet is missing and sends a message to the AccessVideo server to request a replacement. However, this process takes time. The *Target Response Time*, less 400 milliseconds, constrains the amount of additional round-trip you are willing to tolerate in order to provide AccessVideo ARQ with time to make this packet resend request. AccessVideo automatically measures the round-trip delay to the server and back and will increase the number of retries to match the time you allot. *Burst Drop* time specifies the length of time that a connection may be interrupted, yet still be protected against data loss by ARQ.

In *Robust* mode, AccessVideo may slightly exceed the target latency to insure a minimum of 2 retries, to provide, at minimum, a second chance in case the network drops either the first request or a resent data packet. With *Robust* mode off, AccessVideo attempts to keep the added latency to under the target you specify, with the constraint of a minimum of one ARQ retry.

Video Settings

The application settings panel provides three settings that directly control video capture and playback: *Std. Resolutions*, *Freq Lock*, and *Drift Comp*. Checking *Std. Resolutions* constrains the size of the video capture resolution to fall within a standard video resolution. Should a user request a non-standard video resolution, during the negotiation for a connection, AccessVideo would force the connection to fall back to the next lower standard video resolution. Standard video resolutions are: 640x480 (4-CIF), 320x240 (CIF), and 160x120 (QCIF).

Normally, AccessVideo assumes that the video frequency is a standard rate of 29.97 for NTSC and 25 for PAL. (AccessVideo automatically selects PAL or NTSC mode to match the selected video resolution.) *Freq. Lock* instead allows AccessVideo to automatically measure and set the video frequency. This is particularly useful for use with inexpensive video capture devices that may capture video at lower rates, such as 10, 12, or 15 frames per seconds.

When trying to lock to a video frequency, a variable time delay, called Drift, may be introduced by the video signal. Over time, this drift may cause the video and audio signals to lose lip-sync and become misaligned. *Drift Comp* monitors this phase drift and resets the delay to force the video to remain in sync with the audio.

Security Options & HIPAA Compliance

The AccessVideo™ telemedicine system is fully HIPAA compliance and includes a number of security options as a result. Among the main security features are: Secure Login using SSL conditional access, password encryption, strong media-stream encryption, audit trails, and intruder alerts. Most of these features are either automatic or configured on the AccessVideo server. On the AccessVideo client application, you must set up a username and password for each connection to an AccessVideo Server. As general settings for all connections, you must select whether to encrypt the conditional access login interaction with the server using SSL, and select whether you want to enable Password Encryption, as described in this section.

SSL Conditional Access

SSL stands for *Secure Socket Layer*. It is an IETF (International Engineering Task Force) standard used by Internet Web browsers to protect and encrypt sensitive data across the Internet. AccessVideo™ uses public-key RSA 128-bit strong encryption, the same encryption used across the Internet to protect credit-card information in e-Commerce. With SSL Conditional Access checked, password and user information sent to the server to allow access is encoded and kept secure. We recommend that you always keep this box checked.

Password Encryption

Password Encryption is an additional security feature of AccessVideo™ that encrypts the passwords for each connection before storing them to your computer's hard drive. If your computer ever was stolen or broken into, password encryption protects these passwords from being read. With *Password Encryption* on, AccessVideo™ will ask you for a password when first starting up. This password will be used to decode the individual passwords stored by AccessVideo™ for each connection. If you provide an incorrect password, the individual connection passwords will be incorrectly decoded and will thereby prevent unauthorized access to any of your AccessVideo™ servers.

Encoder Selection

By design, AccessVideo™ allows the use of a selection of various video and audio encoders. Upon request as an additional option, BF Technologies can add support for additional video or audio encoders. Currently however, AccessVideo™ only provides support for Microsoft's Windows Media® 9 (WM9) encoding.

WM9 is the latest video encoding technology offered by Microsoft as part of its Windows Media Player 10 package. WM9 is based upon MPEG-4 VC1, which is similar to MPEG-4 AVC, and is currently one of the most advanced and efficient video encoders available today. WM9 has been selected to encode many popular high-definition videos on DVDs. Because of the many advantages of WM9, WM9 is selected by default and is the recommended video encoder.

4 - Adding Connections

The AccessVideo client application maintains a list of user-specified connection profiles. Each connection profile stores all the parameters for that individual connection, including hostname, QoS settings, and send and receive settings. By default, the main application window displays a detailed view of all of the connections, showing all the parameters for each connection. However, the user may select from among several alternate views of the connections as listed under the *View* menu to simplify the display of the stored connection profiles.

An important feature of AccessVideo is its ability to measure the end-to-end Internet connection speed and latency in each direction for a selected connection and to automatically reconfigure the session resolution and data rate in order to produce an optimal video session. It will use these measurements to automatically set the ARQ parameters to minimize packet loss and connection latency.

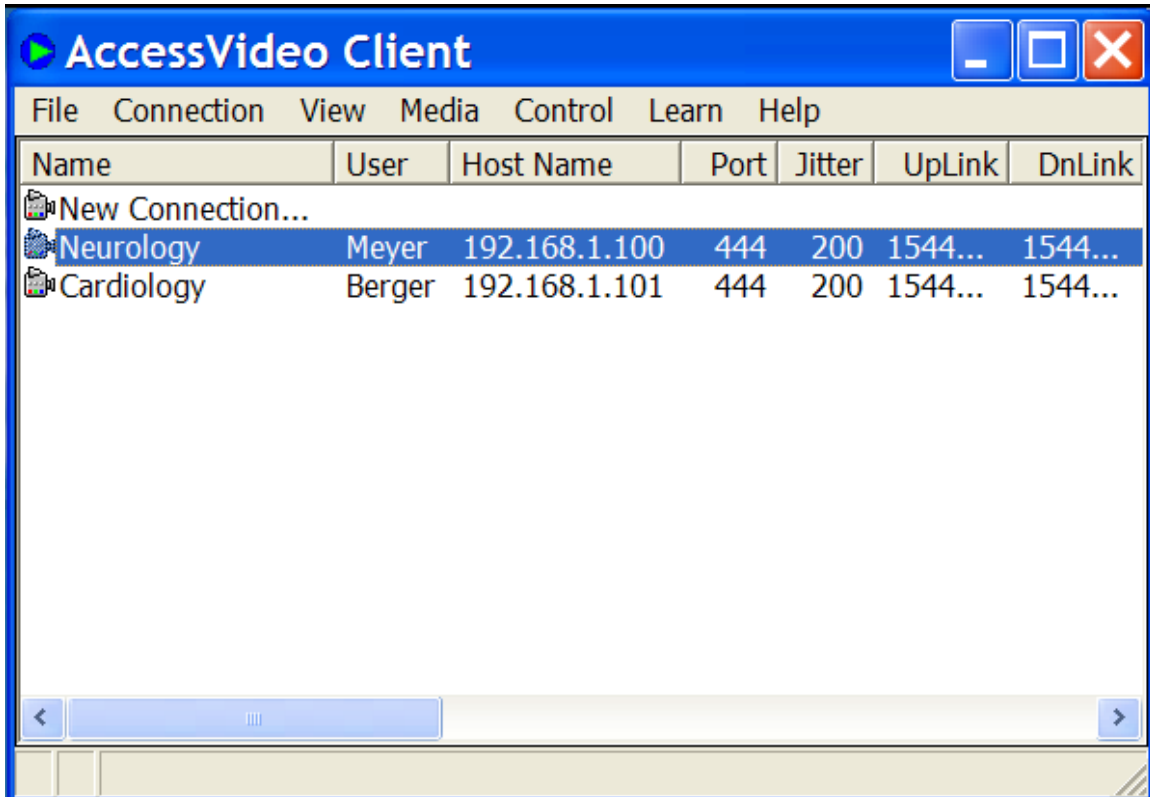


FIGURE 3. Connection list.

Connections List

When started, AccessVideo™ opens a window with a list of your connections to AccessVideo servers similar to Figure 3. The first “connection” listed, *New Connection...*, is not actually a connection at all, but a selection to allow you to create new connections. Alternatively, the *Connection* menu will allow you to create, edit, or delete connections. It will also allow you to start and stop a connection, restart the *AccessVideo™* AutoQoS and automated bandwidth measurements for link calibration, and access various connection statistics. You can also right-click on a connection as a shortcut to some of these features.

To add a new connection, double-click on *New Connection...* and a new connection panel will pop up. To edit an existing connection, select the connection from the connection list by a single mouse click, and then select *Edit* from the *Connection* menu. A connection panel, similar to that shown in Figure 4 will appear. A connection panel has four tabs: Connection, Network, QoS, Send, and Receive. Each tab has its own panel, as described below.

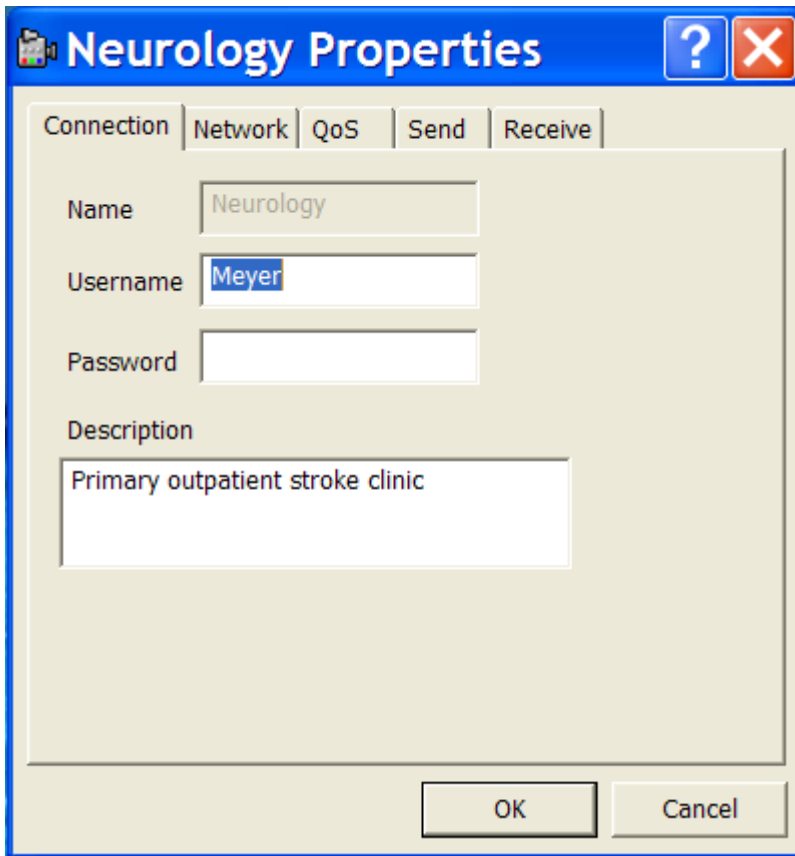


FIGURE 4. Editing a connection.

Connection Panel

The Connection Panel, as shown below in Figure 4, provides general information about the connection, such as the connection name and user login information. You must enter a name for the connection. This connection name can be any arbitrary name you choose. You must also enter a valid username and password. You should contact the AccessVideo server administrator to set up a user account. The description field is only added as a convenience to store notes about the connection. You can ignore this field.

Network Panel

The Network Panel allows you to specify general network connection information to reach the desired AccessVideo server. The most important parameter is the Hostname. Under the *Hostname* field of the network panel you must enter either the IP address for the AccessVideo server, or otherwise enter the fully-qualified hostname. The rest of the parameters, such as *SSL Port*, *Jitter*, *Uplink Speed*, *Downlink Speed*, *Auto QoS*, *Encrypt*, and *Camera Control* come pre-configured with reasonable defaults. You can change any of these settings, but be aware that the *Uplink* and *Downlink* Speeds are automatically updated when you measure the connection speed and the *Jitter* field is updated whenever you start a connection and the *Auto QoS* setting is enabled.

QoS Panel

QoS stands for Quality-of-Service and provides full access to the configuration of the *AccessVideo*™ error correction mechanisms. *AccessVideo* implements two advanced, patent-pending, error correction mechanisms, a Galois-Field based Forward Error Correction (FEC) and an automatic repeat request (ARQ) mechanism. Either, both, or none of these error correction mechanisms may be enabled on a connection.

FEC

AccessVideo™ FEC uses a new patent-pending approach to forward error correction for video over IP that bounds the generation of checksum packets to within a maximum fixed time period, generally set to 100 milliseconds. Because of this new FEC technique, a receiver will never have to wait longer than this time interval before releasing the incoming video for display, thereby minimizing jitter and latency on the receiver. Another novel aspect of QVidia's *AccessVideo*™ FEC is the implementation of a new form of FEC checksum generation based upon Galois-Fields that allows any number of checksum packets to be generated for a single FEC data block. This provides over twice the error recovery when compared with standard parity-based FEC that generates only a single parity checksum packet per data block, and requires interleaving data blocks to recover from a burst packet loss.

To enable QVidia *AccessVideo*™ FEC processing, you must check the *On* checkbox under the FEC section of the QoS panel. The *Overhead* checkbox under this section specifies the number of FEC packets to generate in relation to the media-stream data packets, calculated as a percentage of these data packets, and rounded up to the nearest whole number of packets. Checking the *Robust* box increases the maximum period of time before forcing the generation of an FEC packet from 100ms to 167ms, and also increases the minimum number of FEC packets per data block from 1 to 2 checksum packets.

ARQ

QVidia *AccessVideo*™ includes a patent-pending automatic retransmission request (ARQ) mechanism based upon the well-known Selective Retransmission Protocol (SRP) of Picuch et. al. that can completely restore all dropped packets; even under extremely poor and dynamically varying network conditions. Unlike FEC, which sends a fixed number of error correcting packets regardless of network loss conditions, *AccessVideo*™ ARQ automatically asks for replacement packets whenever the receiver senses any packet loss, and can repeatedly ask for as many packets as are required to completely restore all lost media stream packets. Or when no packets are lost, it may not send any packets at all. And in contrast to TCP/IP protocol, SRP is sensitive to the timing of video and other real-time signals, so that it can guarantee that packets are replaced in time for play out at the user's display, without any interruption in the received video or audio stream. *AccessVideo*™ ARQ adds a user-specified amount of latency (i.e. delay) to the video stream to allow time to request and receive retransmission of a lost packet and insert it into its proper sequence in the video stream in time for play out.

To enable QVidia *AccessVideo*™ ARQ, you must check the *On* checkbox under the ARQ section of the QoS panel. The *Auto QoS* feature of *AccessVideo*™, when enabled, will automatically measure and configure all the other parameters, such as *Num Retries*, *RT Time*, and *Burst* time. The

Robust Mode checkbox under this section forces a minimum of 2 retries when *Auto QoS* is enabled, regardless of the target latency.

Send Panel

The Send Panel provides the parameters to configure the outgoing video and audio streams for transmission from the AccessVideo client application to the AccessVideo server. To enable upstream video transmission, you must check the *Send* checkbox in the *Video* section. For a minimum video resolution of 160x120 pixels (QCIF), we suggest using the default of 128 Kbps for the bit rate. A common value for higher resolution is 320x240 pixels (CIF). For this higher CIF resolution, we suggest using at least 300 Kbps, although it is possible to achieve acceptable video at bit rates as low as 240 Kbps. For many low-cost USB web cameras, such as the Logitech® QuickCam® Pro, which work only at these two resolutions, we suggest checking the *Std. Resolutions* checkbox under application settings.

To enable the transmission of audio from the AccessVideo client to the AccessVideo server, you must check the *Send* checkbox under the *Audio* section. We suggest selecting the default bit rate of 44,100 bits per second. This selection uses the same type of encoding (ADPCM) that was originally developed by AT&T for their telecommunications systems. It provides a good compromise between minimizing the bit rate, while allowing good echo cancellation. Higher bitrates, such as 56 Kbps or 128 Kbps, uses the same MP3 encoding found in portable music players, and provides exceptionally high audio fidelity. However, MP3 encoding uses far more CPU power and increases the encoding latency by about 60 ms. The lowest audio bit rate selection generates only 8 Kbps, but will generally impair the automatic echo cancellation system and result in high levels of received echo.

Receive Panel

The Receive Panel provides the parameters to configure the resolutions, bit rates, and audio encoding for incoming video and audio streams from the AccessVideo server to the AccessVideo client. Downstream video transmission from the server is always enabled. However, you should select the video resolution that best suits your needs. The default resolution of 400x300 pixels provides a resolution about twice that of a VHS video recorder, but about half that of a DVD player. It can generally receive good video quality at 600 Kbps, but may function well from bit rates as low as 450 Kbps. The default of 750 Kbps provides exceptionally high quality over a wide range of video scenes.

To enable the transmission of audio from the AccessVideo server to the AccessVideo client, you must check the *Receive* checkbox under the *Audio* section. As with Audio Send, we suggest selecting the default bit rate of 44,100 bits per second, as it provides a good compromise between minimizing the bit rate, while allowing good echo cancellation. As with Audio Send, higher bitrates, such as 56 Kbps or 128 Kbps, uses the same MP3 encoding found in portable music players, and provides exceptionally high audio fidelity. However, MP3 encoding uses far more CPU power and increases the encoding latency by about 60 ms. The lowest audio bit rate selection generates only 8 Kbps, but will generally impair the automatic echo cancellation system and result in high levels of received echo.

5 - Connection Startup

With your server connections entered from the previous chapter, we are now ready to describe the actual operation of the AccessVideo™ system.

Precautions

Personal computers and the Internet were never initially designed to handle multi-media traffic and applications. By design, computers are multi-functional systems that generally operate many software applications concurrently. AccessVideo™ and Microsoft Windows® have added many unseen features into the fabric of their software to help mitigate disturbances to video and audio content. However, video and audio applications are still susceptible to disturbances and interference by other applications. AccessVideo™ is no exception. Please be aware that activating or interacting with other windows, software applications, or your computers devices or peripherals may interfere with the smooth delivery and performance of your audio/video feed.

In order to assure the highest quality video and audio feeds, please refrain from accessing other software applications during an active AccessVideo™ session.

Link Measurement

AccessVideo includes an automated connection measurement tool that will measure both the up and downlink speeds from the client to the server and automatically store the measured speeds for the connection it measured as part of the connection parameters under the connection's network settings. To access this feature, first highlight the connection you would like to measure by a single mouse click, and then click on *Measure Bitrates* from the *Connection* menu item of the main connection list window. You can monitor its progress along the bottom bar of the connection list window as it measures the up and downstream bit rates. When the bit rate measurement completes, it fills the measured values into their appropriate fields in the network tab for the connection.

Startup and Auto QoS

Double-clicking on a connection in the connections list will start a connection and turn the Connection List into a video window. If AutoQoS is enabled, *AccessVideo™* will measure the connection characteristics for about 10 seconds to automatically optimize the QoS and error correction features of AccessVideo™. If anytime later you suspect that the network characteristics have significantly changed, you can click on *Reset Auto QoS* under the *Connection* menu item to reset the QoS settings to the latest line and network conditions. Because *AccessVideo™* is always measuring the network conditions, resetting auto QoS instantaneously updates the QoS settings.

Note: Resetting the QoS settings may cause a momentary pause or disruption in the video or audio feed. For this reason, the QoS settings are not continuously updating.

Caution: Do NOT access the camera controls either during the initial QoS measurements or anytime just prior to an auto QoS reset. Also we strongly advise against opening, moving, activating, or closing any other software applications or windows during the initial QoS measurement or just prior to an Auto-QoS reset. Any such disturbances during an auto QoS measurement may result in inaccurate QoS settings.

Connection Quality Indicator Lights

AccessVideo continuously measures connection characteristics and monitors connection quality to insure the highest possible video signal. This connection monitoring automatically works in conjunction with QVidia's *AccessVideo*™ ARQ to automatically attempt to request and recover any packets lost in transmission over the network. In certain rare occasions, the Internet or a wireless link may briefly lose connectivity or otherwise cause enough of a disruption in the transmission or reception of packets between the server and client that none of the *AccessVideo* error correction mechanisms are able to recover all packet losses. In such cases, even a single packet loss will trigger one of the two quality indicator lights that appear along the lower left corner of the video window.

These two connection quality indicator lights change color between yellow, red, and green, depending upon the status of the audio and video signals being received. The left-most indicator shows the status of the audio and video stream currently being received and displayed by the AccessVideo client application. The indicator to its immediate right shows the status at the server end of the connection and whether a person watching or listening to the video at the server end is getting a lossless video/audio feed. As long as video and audio packets continue to arrive in time and without any loss, so that the audio and video played out to the user has no network-induced flaws, these indicators will stay green. Any packet loss will cause the corresponding indicator to change from green to red for at least one second. When first starting a connection, during the period when *AccessVideo*™ is measuring the link characteristics, both of these indicator lights are yellow. However upon completion of these QoS measurements, *AccessVideo*™ will reconfigure the QoS parameters to reflect the current network conditions. This initial reconfiguration of the parameters may cause a momentary pause in the video/audio feed, as buffers are refilled. During this possible initial pause both indicators may briefly change to red. However, after this transient condition passes, under normal conditions both indicators should revert back to green and remain green unless or until it senses unrecoverable packet loss.

Camera Control

With *Camera Control* enabled and a connection starts, a camera control toolbar will appear along the top of the video window. With the *Camera Control* checkbox unchecked, the camera control will not appear. From left to right, this camera control toolbar has the following controls: 6 local camera setting presets, a set button, a slider bar for horizontal panning, up/down arrow buttons for tilting the camera, a slider bar to zoom the camera, a *Back* button to revert to the previous

camera pan/tilt/zoom position, 3 global camera setting presets, and a record button to start and stop recording of the video session to a local file.

The local camera presets each store a pan/tilt/zoom value on the local computer running AccessVideo client for quick repositioning of the camera. To set a preset, first move the camera to the desired location, click on the set button, and then click on the preset button to which you would like to store the camera position. Once stored, the camera preset will always be available, even after powering off your computer or the server.

The 3 global presets (to the right side of the camera toolbar) work the same way as the local presets. However, they store the camera position within the camera itself, so that the setting becomes available from any computer and to any user who accesses the AccessVideo server.

To move the camera horizontally, you can either left-click on slider control and, while holding down the mouse button, move the slider control to the desired position and release. The camera will move after the mouse button is released. You can also left-click on the white space to the left or the right of the slider control to move the camera by a large fixed increment. For fine motion control first left click anywhere within the video window so that the keyboard keys will apply to the entire view (if you had previously clicked on the slider, then the keyboard would only apply to the slider control until you left-click within the video window), you can hit the left-arrow key to move one small increment left and the right-arrow key to move right. You can hold down the shift key while pressing the arrow key to double the amount of movement.

Simplified Camera Control

AccessVideo provides a much simpler, more automated interface to controlling the camera on the server. To center the view, you can simply right-click anywhere in the video and the camera will automatically pan and tilt such that the point that was clicked on would become the new center of the view. Alternatively, you can use the left mouse button to draw a rectangle over a portion of the view by holding down the left mouse button, dragging the mouse to draw the new view area within the current view area, and then release the mouse button. Upon releasing the mouse button, the camera will automatically scale the zoom factor as well as move the camera such that the drawn view rectangle will fill the screen.

Recording a Video Session

To record a video clip from a live stream, first configure a file name for the clip from the *Capture Settings...* panel under the *File* menu. By default, AccessVideo will use the data/time stamp as the file name and place the file on the desktop. To begin the recording, click in the *Rec* button on the camera control toolbar. Clicking the *Rec* button again, so that the button is out, its default state, will stop the recording.

Still Image Capture

In addition to capturing video clips from a session, AccessVideo also provides the ability to capture snapshots of a video frame during the video session and store them as JPEG-compressed

pictures. To take a snapshot, i.e., a capture a still image, from a live video stream, just click on *Save Image* menu item from the *File* menu. A JPEG file (having a .jpg suffix) will appear in the directory specified by the file name in the *Capture Settings...* panel under the *File* menu.

Connection statistics

AccessVideo keeps detailed statistics on a connection when it is running. Four menu items under the *Connection* menu provide access to these statistics: *Receive Stats*, *Send Stats*, *Remote Send Stats*, and *QoS Stats*. In particular, clicking on *Receive Stats* will bring up a window showing the statistics for the video stream currently being received. The *Dropped* value under the *ARQ* statistics shows the number of lost video packets, even after applying ARQ error correction, if any. You can compare this number to the *Dropped* value under the *Network* statistics to see how well the *AccessVideo*™ technology is working to restore lost packets.

Media device properties

The *Media* menu list provides fine control over the video and audio capture device along with access to the video and audio encoders. These menu items are only enabled when the parameters are able to be modified and only for devices and encoders and decoders that allow access to their internal parameters. Thus, some of these windows may only be accessed when AccessVideo is in an idle, unconnected state, while other may only be enabled during a connection-started state.

Controls

The Control menu list provides access to certain controls on the server's video camera and also allows access to certain audio-specific settings. These controls are generally accessible when a link is active.

6 – Troubleshooting

Below, we include a list of common problems and some suggestions for overcoming them.

Cannot connect to server

The client cannot send a packet to the server. Please check that the IP address or hostname is correct and that the server is up. Often, it may mean that the server is down or off-line.

Server busy message

Only one user can connect into a system at a time. This message means that another user has logged into the system and is using the server. You must wait for that user to disconnect before trying to connect again.

Choppy audio or video

A poor Internet connection will drop packets and cause the video to pause or become jerky. Likewise, lost audio packets will cause pops, drop-outs, or other artifacts on the audio. You should disconnect and then try increasing the QoS parameters or re-measuring the bit rate before reconnecting.

Screeching noises with audio

AccessVideo servers come with an echo-cancelling microphone on the server, but no echo cancellation on the client side. If you enable audio send and receive and do not use a headset or directional microphone on the client, you may experience feedback problems that manifest itself as a screeching or howling noise. Try lowering the speaker volume and/or microphone sensitivity and speak closely into the microphone.

Excessive delay

The round-trip connection delay is usually set to the *Target Response Time* as set under the *File/Settings...* menu. However, setting *Robust* mode for ARQ may increase the total connection delay. You may wish to turn off *Robust* mode or lower the target response time and suffer with a higher degree of packet loss if the delay becomes unacceptable.

Also, slow link speeds will add to connection latency to accommodate large bursts of video data. If you are able to obtain a higher connection to the server or reduce the video resolution, the delay can often be lowered significantly.

Support contacts

For troubleshooting information and the latest software, please contact BF Technologies either by phone or e-mail at:

Phone: (858) 437-1136

E-mail: support@qvidia.com

Support Hours: Monday - Friday 9:00 am to 5:00 pm PST