Application Note

Connecting ClipRemote to a Modem, Terminal Adapter, or Satellite Data Terminal using a Windows 2000 PC

Introduction

Telestream's ClipRemote system has been designed for use in remote locations where a fast Local Area Network may not be available. In these situations, remote access devices such as Modems, ISDN Terminal Adapters (T/A's), and Satellite Phones may provide the only access to the internet or a private LAN. This application note describes two methods for utilizing the advanced networking and MODEM control features built in to Windows 2000 to connect a ClipRemote to one of these access devices.

Minimum Requirements for the PC

The PC used for the applications described in this document must have at least:

- Pentium class processor
- 64Mbytes system RAM
- Windows 2000
- 10BaseT or 100BaseTX Ethernet adapter
- RS-232 COM Port (or USB Port)

Related Documents

You will need access to the following documents:

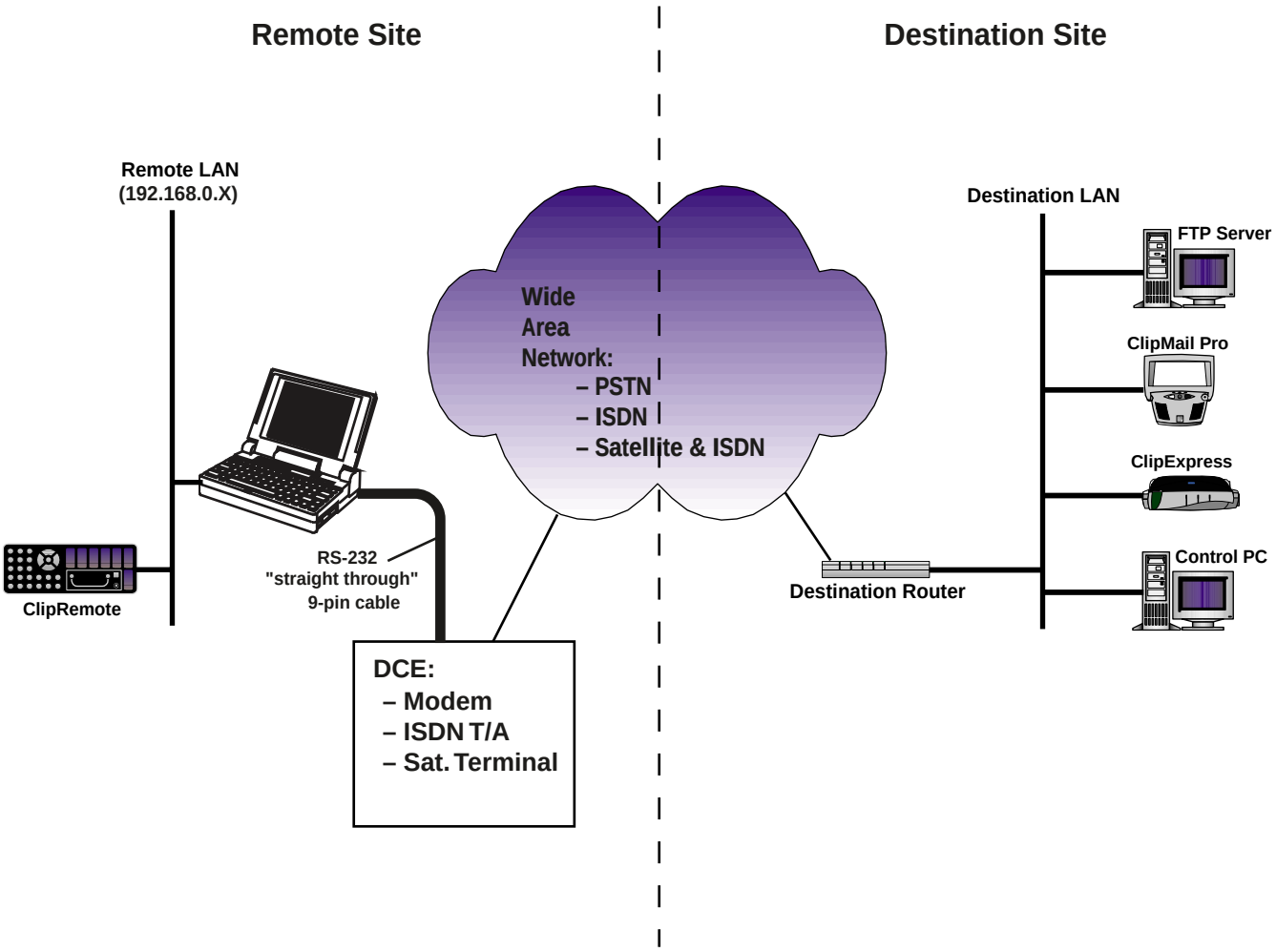
- ClipRemote User's Guide (Software version 3.0 or greater)
- Technical Manual for the DCE in use (Modem, ISDN T/A or Satellite Data Terminal)

Hardware Descriptions

RS-232 serial devices are divided into two categories: Data Terminating Equipment (DTE) and Data Circuit Equipment (DCE). In the familiar case of a PC and an external MODEM, the PC is the DTE (the terminal point for the data) and the MODEM is the DCE (the equipment which deals with the physical circuit – in this case the telephone line). For all serial connections described in this application note, the Windows 2000 PC will be the DTE and the MODEM, ISDN T/A, or satellite phone will all be referred to as the DCE.

For the sake of discussion, the physical locations are referred to as the **remote site** (where the ClipRemote is located) and the **destination site** (where another Telestream ClipMail appliance and/or FTP server is located). Note the implied direction of data flow from remote site to destination site is only for clarity. Once the connection is initiated at the remote end, clips may be sent in either direction.

Refer to the following network diagram to view a general connection scheme.



The table below compares the three different connection devices described in this application note.

DCE	Max. Bandwidth (kbits/sec.)	Typical Round Time (msec)	Typical Error Rate	Typical Cost
Analog 56K Modem	52 or less	150	Negligible	Long distance call
ISDN T/A	64 or 128	50	Negligible	Long distance call + ISDN connect time
Satellite Data Terminal (Inmarsat)	64	1200	1 error per million bits (Avg.)	7-10 $US per minute

Configure a DCE for "Internet Connection Sharing"

Windows 2000 allows a user to configure a DCE for "Internet connection sharing." Enabling this feature creates a small private Ethernet LAN with an IP address of 192.168.0.x, with the PC having an address of 192.168.0.1. The PC acts as the gateway, routing any packets with a destination IP address outside the 192.168.0.x network out through the serial port to the DCE. The dialing can be done automatically or manually, and all time-outs and redial options are available. Following is a step-by-step configuration procedure for all equipment involved.

On the ClipRemote

1. From the Main Menu, go to Setup, then Network. Set the IP address to 192.168.0.127, the Network Mask to 255.255.255.0, and the Gateway to 192.168.0.1 (the PC).
2. Reset the ClipRemote so that the above changes take effect by selecting the "Shut Down" button on the ClipRemote on-screen display.
3. When the ClipRemote comes back up, push the button labeled "Remote Mode" on the keypad.

On the Remote PC

1. Install the necessary drivers for the DCE in use (the Nera World Communicator Satellite Data Terminal may be controlled as a "Standard 28800 bps Modem" – no special drivers are required).
2. Go to "Start", then "Settings" then "Dial Up Networking" and double click on the "Make New Connection" icon. This will start a wizard which will help to configure the dial up connection.
3. Under the "General" tab, set the Port to the proper COM port to be used, and the Maximum speed to 115200.
4. Under the "Connection" tab, set the Data bits to 8, the Parity to None, and the Stop bits to 1.
5. Click the "Advanced" button in the lower right corner of the window and check "Use flow control" and select "Hardware (RTS/CTS)."
6. Type in the phone number to be dialed. On the Nera World Communicator, the general format is: (00)(Country Code)(City / Area Code)(7 digit number)(#). For example, to dial the number 478-3992 in area code 530 in the US, the dial number is: 0015304783992#
7. Click on "finish." A new icon should appear under Dial Up Networking with the name given.
8. Right click on this new icon to edit its' properties.
9. Under the "general" tab, un-check "Use Area code and Dialing Properties."
10. Under the "Server Types" tab, check Enable Software Compression.
11. Depending on the configuration of the destination site, you may need to check "Log on to network" to gain access to the destination ClipMail unit. If in doubt, check with the network administrator.
12. Under "Allowed network protocols", check TCP/IP.
13. Click on the TCP/IP Settings button and enter the TCP/IP parameters required for connecting to your destination network. If these are not known, check with the network administrator.
14. Click on the "okay" button to exit the properties setup.
15. Under the "sharing" tab, check the box labeled "Enable Internet Connection Sharing for this connection."
16. If you would like the DCE to be dialed automatically whenever packets arrive that are destined for a network other than the remote LAN, check the box next to "Enable on – demand dialing." If you would prefer to initiate connections manually, leave this box un-checked.
17. If the DCE is connected and properly configured, double click on the icon to test the connection. If the connection is made successfully, the pop-up status window will shrink into a small icon on

the task bar, (it looks like two computers connected together). Right click on this icon, then click on the “disconnect” button. Due to the high cost of the Satellite data connection, it is recommended that the timeout be set to 1 minute or less and that the connection be manually disconnected when it is no longer in use.

The ClipRemote is now ready to send a clip to a destination site. Due to the high latency, the “Testing Connection” Pop-up window may time out the first time when dialing through a satellite terminal, but it should succeed once the connection has been established on the PC.

Also due to the long round trip delays for the satellite service, the “Reserving Space and Preparing to Send Parcel” pop-up window may remain on the screen for two to three minutes.

Using the Telestream Network Controller Software and FTP

In addition to the minimum system requirements, this method requires that the Telestream Network Controller application be installed on the PC at the remote site and at the destination site for controlling the destination ClipMail unit. This method introduces two more steps to transporting a clip from the remote site to the destination site, but uses less connection time since the MTP functions of reserving space, etc. are not attempted over the WAN. Following is a step-by-step procedure for moving a clip from the ClipRemote to the destination ClipMail. Unless otherwise noted, all configuration details listed for Method 1 apply to this setup as well.

Sending the .mpg file

On the ClipRemote

Push the “remote mode” button on the front panel keypad. “Remote Mode:192.168.0.127” should appear on the output video on screen display.

On the Remote PC

1. Start the Telestream Network Controller application, acquire the ClipRemote system and login.
2. Once the clip(s) have been digitized and stored in the “new” box on the ClipRemote, they will need to be moved to the “Saved” box as follows: Go into the “Send Mail” screen, select the “new” tab, click on the “done” button, then the “Save” button.
3. Go into the “Check Mail” screen, select the “Saved” box, select one of the clips to be sent, then click on the “Save Local” button on the lower right of the screen.
4. Select a meaningful file name and location for the .mpg file on one of the PC's drives.
5. Repeat steps 3 and 4 for each clip to be sent.
6. Dial the destination network by double clicking the Dial Up Networking icon created earlier.
7. Open an MS-DOS command window by clicking on Start, then Run, then typing “cmd.”
8. In this window, change directories to the one where the .mpg files are stored. Type “dir” to view the files.
9. Type “FTP <destination IP address>” at the DOS prompt to start the FTP client.
10. Login to the destination FTP server.

11. Type “put <filename.mpg>” for each of the files to send.
12. Once all files have been sent, remember to disconnect to avoid any extra per-minute charges.

Note: Steps 7 through 10 may be automated by using a readily available Windows based FTP client program. WSFTP Lite is an excellent one.

Viewing the .mpg file

On the Destination ClipMail

Put the ClipMail system in Remote mode so that it may be controlled via the Network Controller software. Remote Mode: <destination IP address> should appear on the output video onscreen display.

On the Destination PC

1. Start the Telestream Network Controller application, and acquire the Destination ClipMail system.
2. The destination FTP server must be setup on the ClipMail as described in the ClipMail Users guide. Refer to the section titled “How to Receive (Pull/Get) from an FTP Site”
3. Go into the “Send Mail” screen, click on the text “Add Clips to Send” and then click on the “Batch Import” button. This opens a file browser window on the destination FTP server.
4. Select the clip(s) to be viewed, then click on the “Import” button followed by the “Cancel” button.
5. The new clips are now available in the Inbox for viewing, forwarding or printing to tape.

Special Considerations for Satellite Data Communications

Telestream appliances use FTP (File Transfer Protocol) to send and receive MPEG files and also to communicate with each other using the Telestream proprietary MTP (Media Transfer Protocol). FTP uses TCP connections, which require that acknowledgement packets are received from the recipient of the data. The sender will only transmit a certain amount of data without receiving an acknowledge back from the receiver before it stops and waits. This amount of data is set by the receiver and is called the window size.

We recommend that the receiver advertise a window size of at least 64Kbytes for a satellite connection. This is the maximum value for Windows 2000 and NT. This is due to the long round trip time between remote and destination systems when using a satellite connection. Telestream appliance products advertise a window size of 64Kbytes, but a Windows 2000 or NT system will advertise a default window size of only 8760. This limits the maximum throughput achieved over the satellite link. The value for TcpWindowSize may be changed by editing the registry on the destination FTP server. This should be done only by someone familiar with editing the Windows registry. A good source for information on this topic is http://support.microsoft.com/support/kb/articles.

“Dr. TCP” is a handy utility you can use for setting the window size on Windows 2000 or NT servers. It allows you to change TCP/IP parameters without having to edit the system registry. It is necessary to reboot the server after changing the TCP Receive window before the new value will take effect. “Dr. TCP” may be downloaded from several internet sites.