COMTECH
EF DATA ™

VFS v1.2.x
VIPERSAT File Streamer

USER GUIDE

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User Guide

Document Revision History

Revision	Description
1.0	**Initial Release**

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1

GENERAL

How to Use This Manual

This manual documents the features and functions of the Vipersat File Streamer software application, and guides the user in how to use this product in a Vipersat network.

Workstation users, as well as network administrators and operators responsible for the configuration and maintenance of the Vipersat satellite network, are the intended audience for this document.

Manual Organization

This User Guide is organized into the following sections:

Chapter 1 — General

Contains VFS product description, customer support information, and manual conventions and references.

Chapter 2 — Installation

Covers the steps for installing the VFS client software application on a host PC/ workstation, and enabling the VFS feature option on Vipersat modems.

Chapter 3 — Using VFS

Describes using VFS for streaming data files over the Vipersat network at high transmission rates between PC hosts running the VFS application.

Appendix A — Glossary

A glossary of terms that pertain to Vipersat satellite network technology.

Conventions and References

The following conventions are utilized in this manual to assist the reader:

NOTE **Note:** Provides important information relevant to the accompanying text.

Tip: Provides complementary information that facilitates the associated actions or instructions.

Caution: Provides explanatory text that notifies the reader of possible consequences of an action.

Warning: Provides precautionary text that describes a potentially hazardous situation. Failure to take or avoid a specified action may result in damage to equipment.

The following documents are referenced in this manual, and provide supplementary information for the reader:

- *Vipersat CDM-570/570L User Guide* (Part Number 22125)
- *Vipersat CDD-56X Series User Guide* (Part Number 22137)
- *Vipersat Management System User Guide* (Part Number 22156)

Product Description

Introduction

Vipersat File Streamer (VFS) is a software application that allows rapid file transfers over the Comtech EF Data Vipersat network between host PCs that are running the VFS application. VFS runs on a Microsoft Windows-based PC/workstation and, together with the Vipersat Management System (VMS), utilizes the bandwidth-on-demand capabilities of the system for applications such as file transfers.

VFS, in conjunction with Vipersat-enabled IP modems and the VMS, can stream large files from one workstation to another workstation over the satellite network. VFS overcomes the limitations of TCP/IP over satellite links by implementing an efficient and reliable datagram protocol, while at the same time having the ability to request dynamic SCPC (*dSCPC*) satellite bandwidth.

Simplicity of Operation

Through its graphical user interface, VFS simplifies the file transfer process by allowing the operator to select which files or folders are to be transferred and where they are to be stored. Files or folders can be dragged from the desktop or Windows Explorer™ and dropped into the VFS window to create a new transfer session. Transfers can be scheduled on a periodic basis or performed immediately. Scheduled transfers during non-peak hours aid in avoiding network congestion.

Overview

Designed to transfer files across the Vipersat network over satellite, VFS uses UDP as a transport layer protocol together with the proprietary Streamload protocol rather than using TCP, a common standard for computer communications. The advantages that TCP/IP provides for typical internet communications can become limitations when passing traffic over a satellite network, where inherent delays can be mistaken for congestion or low bandwidth, resulting in compromised transmission rates. Instead of constantly monitoring for acknowledgements and retransmission of bad or lost data, the Streamload protocol streams all data packets and performs any necessary retransmission only at the end of the session.

With the addition of VFS into the Vipersat Network solution, channel utilization efficiencies improve dramatically over standard FTP file transfers.

VFS is a peer-to-peer application where each host in the network can directly communicate with any other host. With VFS, there is no centrally located server required to manage file transfers in the network. VFS authorization is controlled

by enabling a FAST feature code within the gateway modems at each endpoint in the network.

VFS receives authorization from the local CDM terminal, which serves as a proxy between VFS and the VMS, then utilizes VESP to request switches from VMS to support the required bandwidths for file transfers. Any number of transfers—incoming or outgoing—can be handled at any time. Because VFS runs as a Windows service on the host PC, logging in is not required and file transfers are managed unattended.

The VFS GUI configuration tool is used to schedule session transfers of individual files or entire directories, and even set up "hot" directories where any file placed into that directory is immediately sent to its destination.

A typical network configuration diagram is shown in figure 1-1, below. File transfers can be executed between the Hub and a Remote, as well as between two Remotes utilizing a mesh application.

NOTE **Note:** For meshed circuits, an expansion unit is required at the receiving Remote and at the Hub. When transferring a file from a Remote to the Hub, an expansion unit is required at the Hub only. A file transfer originating at the Hub and sent to a Remote will utilize the TDM outbound, and no expansion unit is required.
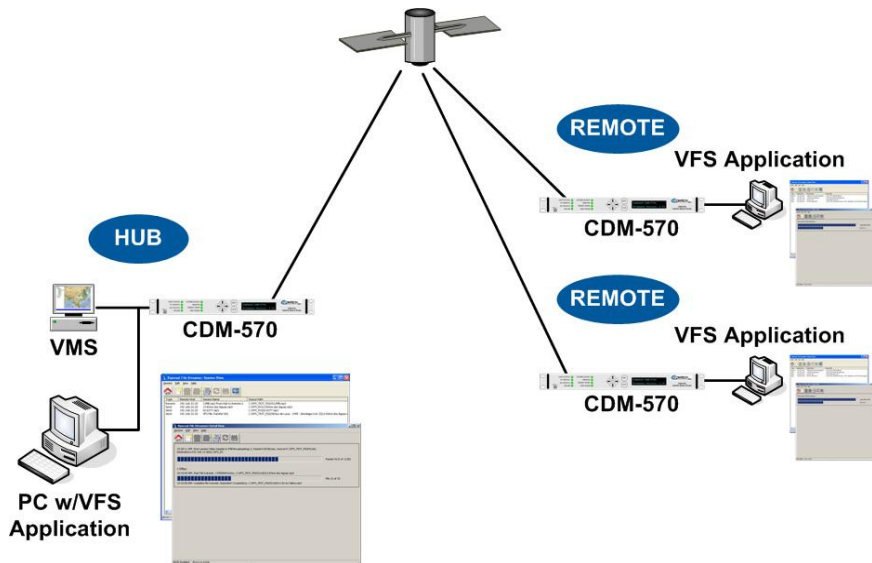
Figure 1-1 VFS Application on a Vipersat Network

Features

- Maximize (up to 99%) channel utilization of satellite bandwidth for all bit rates
- Significant reduction in file transfer time when compared to TCP/IP-based solutions such as FTP or HTTP
- Integrates with the Vipersat Management System, providing dynamic SCPC satellite bandwidth for all file transfers
- Eliminates the requirement for additional hardware devices such as PEP products or accelerators
- Improved OPEX savings
- Simple GUI interface and ease of setup
- Files can be distributed on a schedule or immediately
- Event logging of file transfers and real time transfer status indicators
- Runs in the background as a Windows Service, even when user is not logged onto host PC

File Transfer Status

The progress of sending and receiving file transfers is visually displayed through the Progress View screen. Progress bars exist for the duration of the transfer. Progress bars use color coding to indicate transmission state. Blue indicates a normal transfer state, while yellow indicates missing packets are being resent.

Event Log

VFS maintains a log of files transferred in both sent and received directions. Information contained in the event log indicates the size of the file, the source and destination locations, as well as the allocated bandwidth.

System Requirements

VFS is a Windows™ based application that can be run from any client PC using Windows 2000 or higher and must meet the hardware and software requirements listed below:

Client PC Components

- CPU – Pentium IV, 3.0 GHz or higher
- Operating System – Windows 2000, Windows XP, Windows 2003 Server
- RAM – 1 GB
- Bus Speed – 100 MHz
- Hard Disk Space – 20 GB
- Video – XVGA, 1280 x 1024, 75 Hz
- Network Interface – Ethernet 10/100 Base-T NIC

Satellite Network Components

- Satellite Modem(s):
  Gateway Modem – Vipersat IP Modem with VFS FAST option enabled
  Expansion Unit(s) – as required per application
- Vipersat Management System – VMS v3.3 or greater

Customer Support

Contact Information

Contact Comtech Vipersat Networks Customer Support for information or assistance with product support, service, or training on any Vipersat product.

Mail: 3215 Skyway Court
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USA

Phone: 1+510-252-1462

Fax: 1+510-252-1695

Email: support@comtechefdata.com

Web: www.comtechefdata.com

Reader Comments / Corrections

If the reader would like to submit any comments or corrections regarding this manual and its contents, please forward them to a Comtech Vipersat Customer Support representative. All input is appreciated.

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VFS INSTALLATION

This chapter provides the steps necessary to install the VFS software application on a host PC/workstation, and the configuration of the Vipersat modems and the Vipersat Management System that is required for VFS usage.

Installing VFS on Client Workstation

NOTE	**Note:** If an earlier version of VFS is currently installed on the host PC, that version of VFS must first be *uninstalled* prior to installing a newer version.

The Vipersat File Streamer software should be installed on an industry-standard computer running Microsoft Windows 2000 or later operating system. Refer to "System Requirements" on page 1-5 for the recommended system configuration.

The VFS software is located on the Comtech EF Data website (*www.comtechef-data.com/software.asp*) for easy downloading of the installation files:

readme.txt
Text Document
1 KB

VfsInstall.exe

Figure 2-1 VFS Installation Files

1. Download the VFS installation files to the desktop of the host PC/
workstation.

2. Double-click on the **VfsInstall.exe** icon. The Vipersat File Streamer Setup
wizard will open and display the Installation Options window.
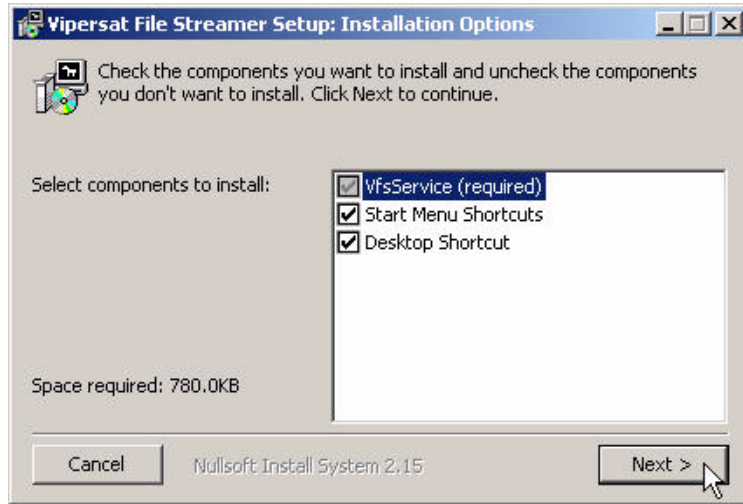
Figure 2-2 VFS Setup, Installation Options

3. Select the installation options, then click the **Next** button. The Installation
Folder window will appear.
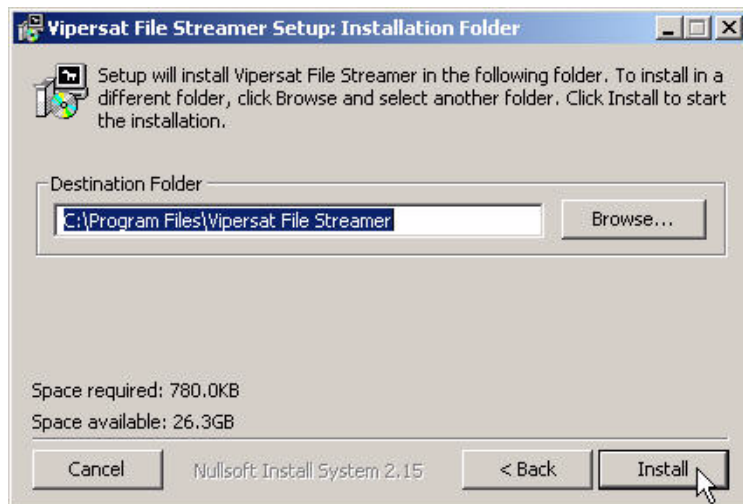
Figure 2-3 VFS Setup, Installation Folder

4. Designate the installation folder, if different from the default, then click the **Install** button. The Installation Progress window will appear.
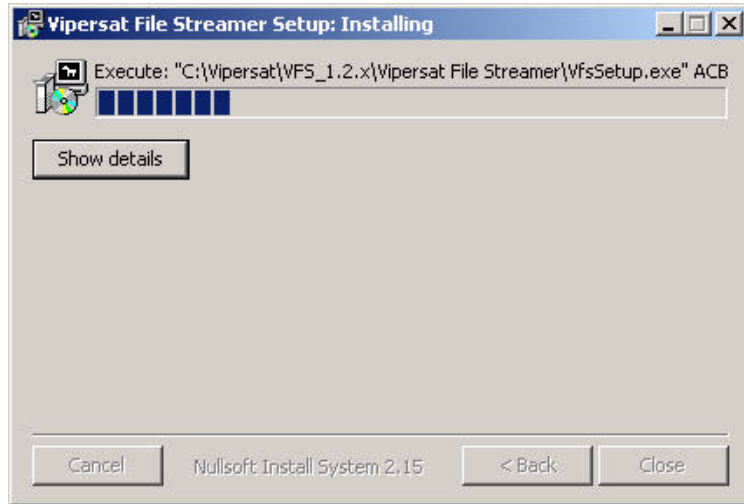
Figure 2-4 VFS Setup, Installation Progress

VFS Setup

As the progress bar expands, the VFS Setup window appears. The parameter settings in this window will be saved as the default values that will be displayed in the **Global Configuration** window and the **Session Configuration** window when creating a new VFS session.
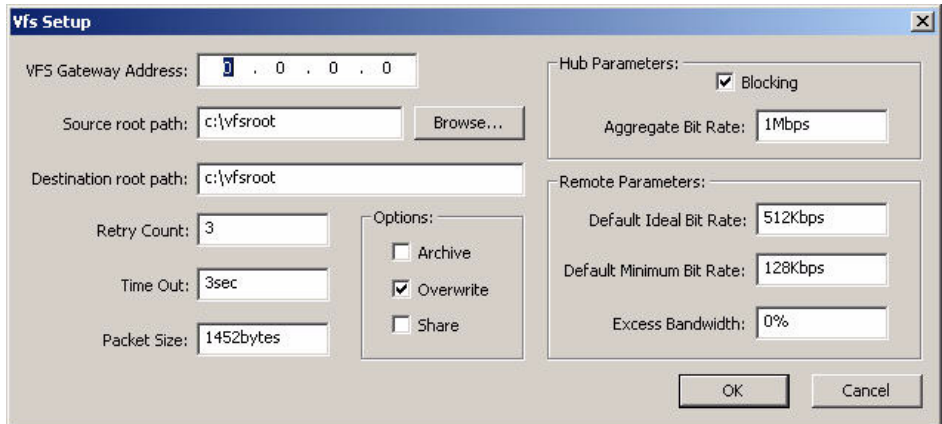
Figure 2-5 VFS Setup, Session Default Settings

5. The most important parameter to set is the **VFS Gateway Address**. Enter the IP address of the Vipersat modem (e.g., CDM-570L) on the local network that serves as the gateway to the VMS for this PC/workstation.

6. Set the default parameter values for Session Configuration:

Source Root Path – Directory path location on local transmitting host from which files will be transferred.

Destination Root Path – Directory path location on remote receiving host to which files will be transferred. This must be a valid/existing path.

Ideal Bit Rate – Maximum bit rate for file transfer. Ideally, this value will match the *Application Policy* maximum bit rate.

Minimum Bit Rate – Minimum bit rate for file transfer.

7. Set the default parameter values for Global Configuration:

Retry Count – Number of retries allowed to complete any single VFS transaction (e.g., session set-up, VESP, dropped packet retransmission).

**Time Out** – Amount of time allowed to attempt to complete any single VFS transaction before ending that attempt. This time must accomodate any delays and/or latencies expected in the network.

The check box Options are defined as follows:

Archive – Once the specified file/folder has been successfully transferred, it is removed from its source directory and placed into the **VFS Archive** folder that is created in that same directory. Once the file/folder has been archived, it is no longer available for subsequent transfers from the source directory.

Overwrite – For periodically scheduled transfers, the received file overwrites the previous copy of that file in the destination directory.

Share – Allows shared access to the source and destination file during file transfer.

Blocking – Prevents concurrent file transfer sessions. This is an option for Hub gateway modems to prevent exceeding the bandwidth on the TDM outbound carrier.

Aggregate Bit Rate – The maximum sum of the bit rates for all concurrent VFS sessions allowed over the TDM outbound channel from the Hub. This parameter must be set to a value that is less than the available bandwidth of the TDM outbound.

Excess Bandwidth – Percentage of additional bandwidth required to accommodate any overhead transmitted from a Remote.

8. Once the default configuration values have been entered, click the **OK** button to save the settings.

The VFS Installation status window will appear, displaying a list of successive processes that have occurred for this installation. The last status entry should confirm that the VFS service is running.
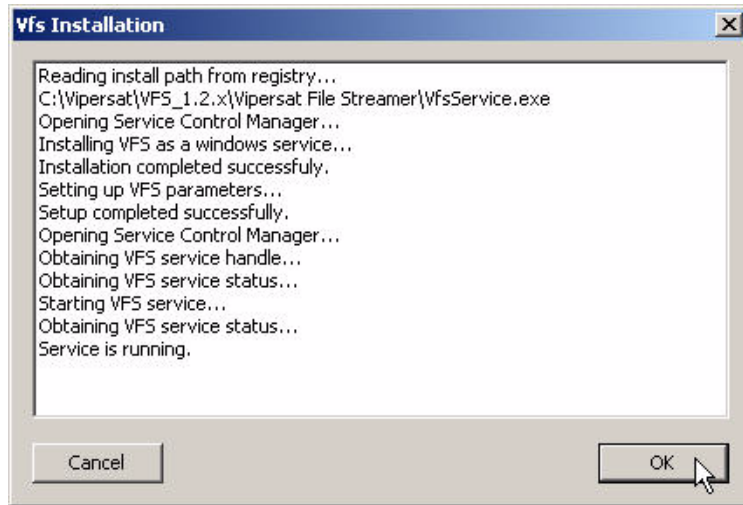
Figure 2-6 VFS Setup, Installation Status

9. If installation is *successful*, the **OK** button will appear in the lower right area of the window.
Click the **OK** button to display the VFS Setup window (figure 2-7) showing that the installation is completed.

If VFS installation is *not successful*, the OK button will not appear in the window, and the only option is to **Cancel** the installation.
Contact the network administrator for assistance.
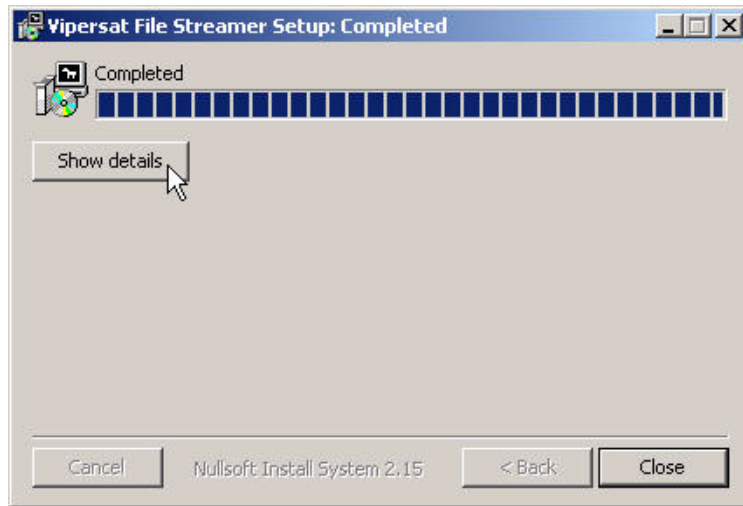
Figure 2-7 VFS Setup, Installation Completed

Clicking on the **Details** button will display the sequential steps of the installation process.
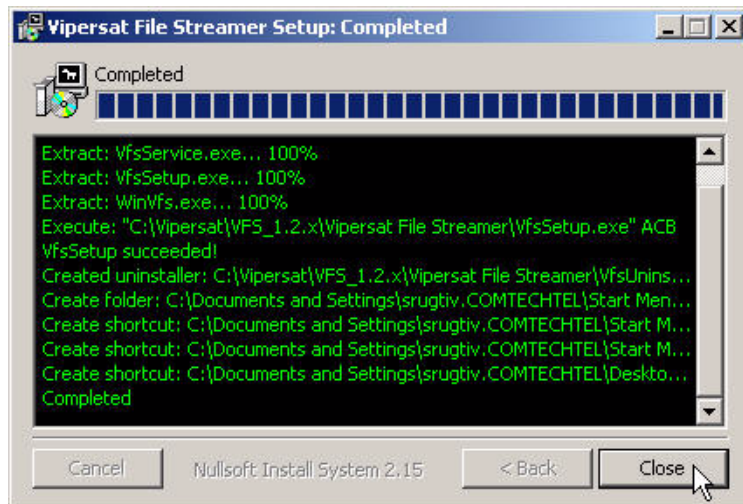
Figure 2-8 VFS Setup, Completed Details

10. Click the **Close** button to close the VFS Setup window.

A number of related files are installed in the designated VFS directory, as shown in figure 2-9, below.

Figure 2-9 Files Installed in VFS Directory

WinVfs

The **WinVfs.exe** file opens the client application that displays the graphical user interface used to create and configure VFS sessions, and monitor file transfer progress.

VfsService

The **VfsService.exe** file runs the main VFS Service program which executes the file transfer sessions created with the WinVfs client application.

VfsService starts upon completion of VFS installation, and continues running in the background to provide unattended VFS operation. Opening WinVfs automatically starts VfsService, if it isn't running already.

By default, the service is installed with a **Manual** startup setting. Optionally, the startup setting can be changed to **Automatic** using *Windows Services* to ensure that the Service is automatically restarted following a PC/workstation reboot/restart.
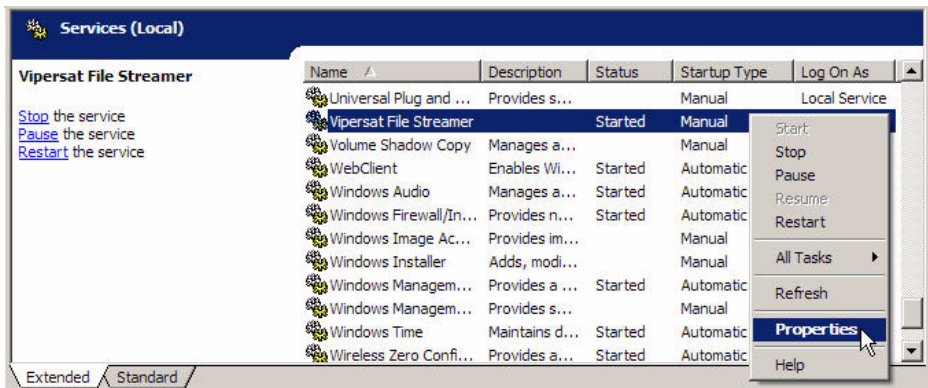
Figure 2-10 Windows Services
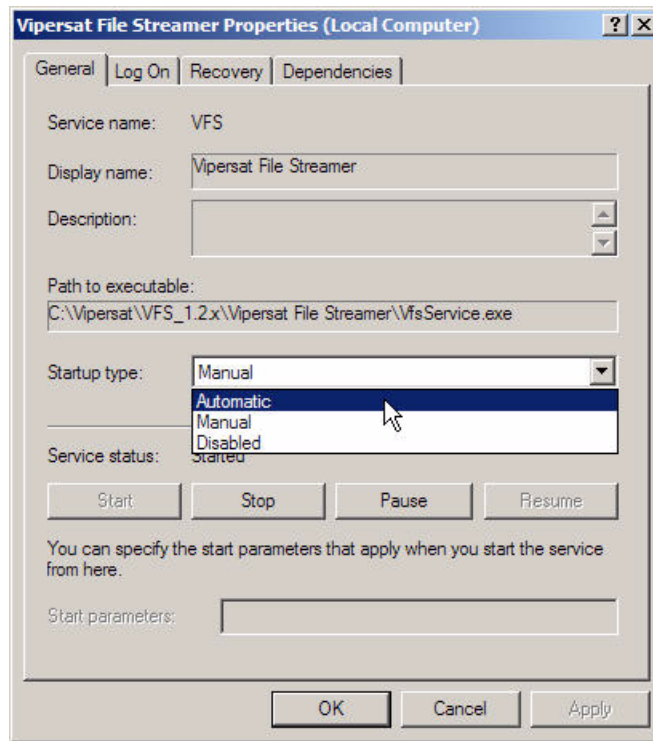
Figure 2-11   Vipersat File Streamer Properties

This completes the installation of the VFS application on the client workstation. The next step is to configure the VFS features on the gateway modems and the VMS, as covered in the next section.

VFS Feature Configuration

In order for the VFS software application to successfully perform a file transfer, the Vipersat satellite modems serving as VFS gateways and the VMS must be configured appropriately.

Vipersat Modem Configuration

Using either the Parameter Editor (VMS or Vload) or the modem CLI, configure the VFS Gateway Modems as follows:

- Enable **Automatic Switching** on each modem (see example below).
- Enable the **Vipersat File Stream** feature on each modem.

    This involves <u>two</u> requirements:

    one, the **VFS Feature Code**, an optional feature that must be purchased for each Vipersat modem, must reside on the unit;

    two, the Vipersat File Stream feature must be enabled, as shown in the example below.
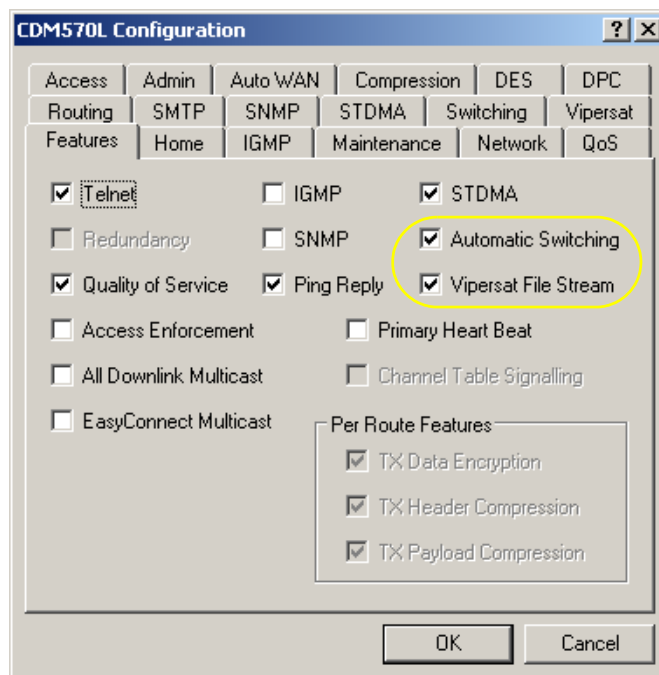
Figure 2-12 Feature Configuration, CDM-570L

Refer to the *Vipersat CDM-570/570L User Guide* (Part Number 22125) and/or the *Vipersat CDD-56X Series User Guide* (Part Number 22137) for additional information on modem configuration.

VMS Configuration

Use the VMS to configure the Inband Policy Switching parameters for the Remote Subnets as follows:

- Enable **Automatic Switching**
- Define a policy for **Type 1** (default type for VFS), as shown in the example below.
- For best bandwidth utilization, ensure that the specified **Maximum Bit Rate** for the policy matches or exceeds the Ideal Bit Rate setting that will be used for the VFS sessions.
- If Load switching is enabled, ensure that the Load switch settings do not overlap/conflict with VFS bandwidth settings.
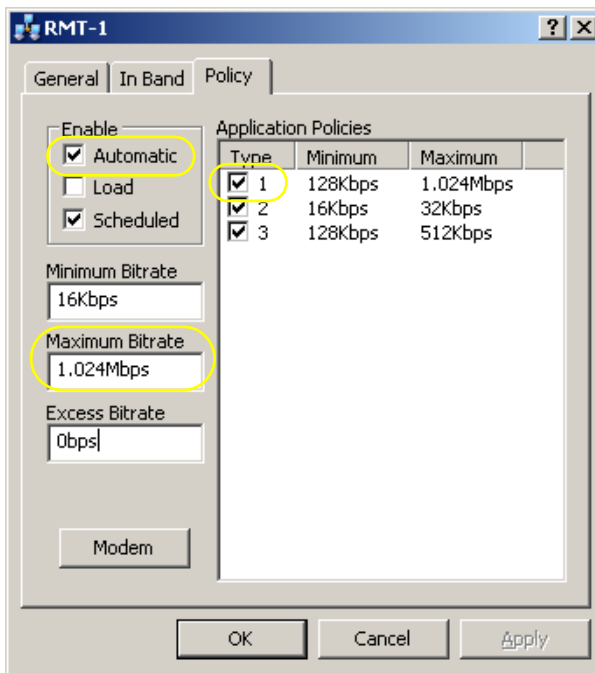
Figure 2-13   VMS Policy Configuration, Remote Subnet

Refer to the *Vipersat Management System User Guide* (Part Number 22156) for additional information on VMS configuration.

USING VFS

Main Window Description

This section describes how to use the controls and capabilities that are available in VFS. The four functional areas of the **Main Window** are shown in figure 3-1, below.

Figure 3-1 VFS Main Window, Functional Areas

Menu Bar

The VFS commands are provided within four pull-down menu items in the **Menu Bar**, shown at the top of figure 3-1.

Session

The Session pull-down menu includes the following commands:

- **New** – Create a new VFS session.
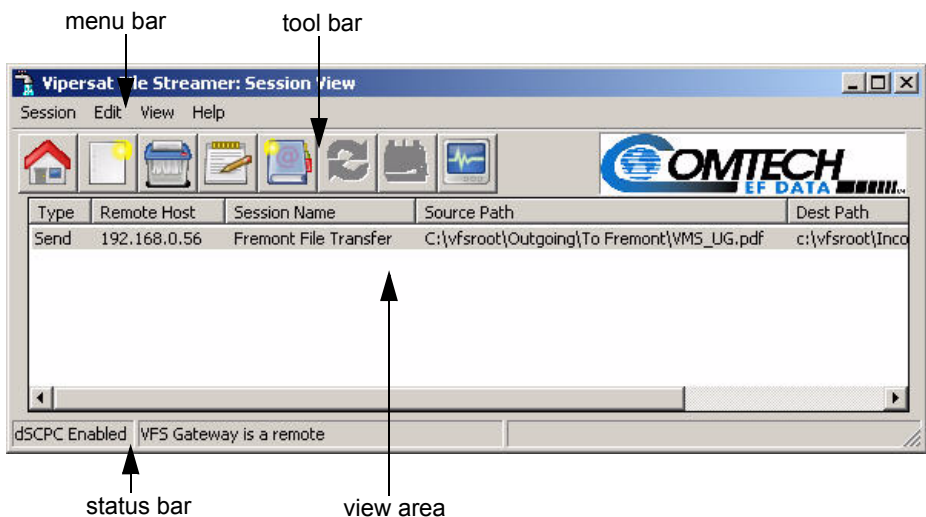- **Edit** – Edit an existing VFS session. This command is only available when a session is selected in either the *Session List* or the *Schedules* view. This command is the same as the *Edit–Session* command.
- **Delete** – Remove an existing VFS session. This command is only available when a session is selected in the *Session List* view.
- **Exit** – Exit the VFS client application.

Edit

The Edit pull-down menu includes the following commands:

- **VFS Gateway** – Edit the VFS Gateway IP Address for this PC/ workstation (see "VFS Gateway" section on page 3-6).
- **Configuration** – Edit the global configuration parameter settings for VFS.
- **Session** – Edit an existing VFS session. This command is only available when a session is selected in either the *Session List* or the *Schedules* view. This command is the same as the *Session–Edit* command.

View

The View pull-down menu includes the following commands:

- **Refresh** – Updates the current listing view. This command only appears when in either *Log* view or *Schedules* view.
- **Change Date** – Select the desired Event Log file (by date) to view. This command only appears when in *Log* view.
- **Session List** – Display list of existing sessions with send/receive information.
- **Progress** – Display the file transfer—receive or transmit—progress; provides session name, file number, and packet number.

- **Detail** – Display the file transfer progress detail, including time, directory path, data bit rate, file number, and packet number.

- **Event Log** – Display the sequence of events for the VFS service and file transfers.

- **Schedules** – Display list of existing sessions with scheduling information.

Help

- **About VFS** – Display version and date information for *VFS Service* and *WinVfs* client application.
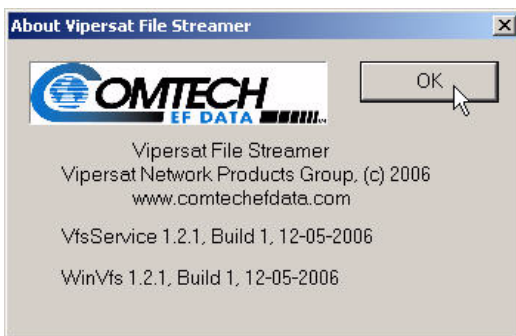

Figure 3-2 About Vipersat File Streamer window

Tool Bar

Just below the Menu Bar, eight of the most commonly used VFS commands are presented as button icons in the **Tool Bar**, as shown in figure 3-3, below. These command buttons provide an easily executable alternative to accessing the same commands from the pull-down menus.
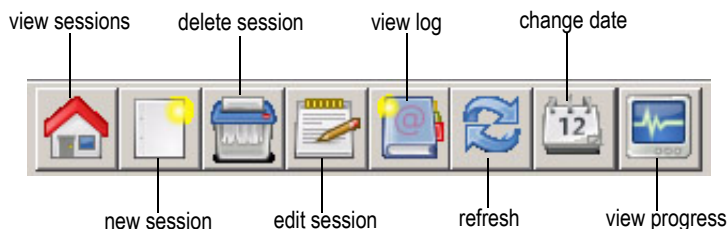
Figure 3-3 VFS Tool Bar

The buttons are context-sensitive and only active when appropriate. Inactive buttons appear as grayed-out shadow icons.

Status Bar

Appearing at the bottom of the main window, the **Status Bar** indicates the current state of the VFS Gateway and whether or not VFS is enabled.

If the Gateway IP Address is detected by VFS and is found to be a VFS-enabled modem, the modem's role—*Hub* or *Remote*—will be displayed in the status bar. File transfers can occur with this status.

> When the gateway modem role is **Hub**, dSCPC will show as *Disabled* since no switching is required; data is transferred using the TDM outbound channel.

> When the gateway modem role is **Remote**, dSCPC will show as *Enabled* since switching is required.

If the Gateway IP Address is not detected by VFS or is not found to be a VFS-enabled modem, the status bar will display *VFS Disabled* / *Cannot reach proxy* or *Not connected*. File transfers can not occur with this status.

View Area

The **View Area** of the main window displays a listing of existing sessions, event log entries, and file transfer progress activity, depending on the current view mode.

Clicking on an existing session that appears in the view area will select that session and allow a command, such as *Edit Session* or *Delete Session*, to be executed on that selection.

Starting VFS

To start VFS, open the **WinVfs.exe** application from one of the three locations:

- The winvfs shortcut icon on the desktop
- The Winvfs pick from **Start\Programs\VFS\Winvfs** menu
- The directory that was specified during the installation process

The initial **VFS** main window will appear, as shown in figure 3-4.
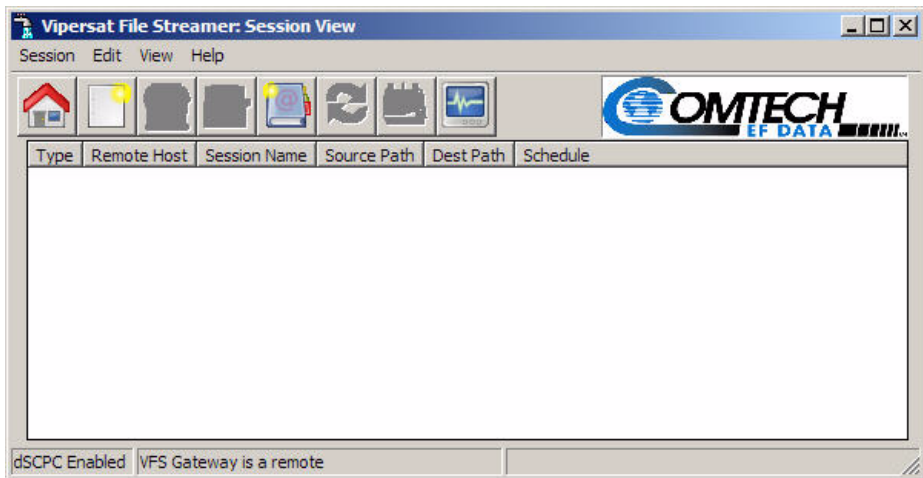
Figure 3-4 VFS Main Window, Initial

| NOTE |

Note: Opening WinVfs automatically starts the Windows service **VfsService.exe** that runs in the background. This service appears under Windows *Services*. When all sessions have been created and scheduled, the WinVfs client application can be closed; file transfers will be managed by the VFS Service that continues to run in the background.

Verify VFS Status

Click on the **View Log** button in the tool bar to display the historical status of VFS in the Event Log, as shown in figure 3-5, below. Information for the starting of the service, the authorization provided by the VFS Gateway modem, the modem role and whether switching is enabled is provided. Note that each log entry is time stamped; the date of the event is used for the .txt file name that appears in the window header.
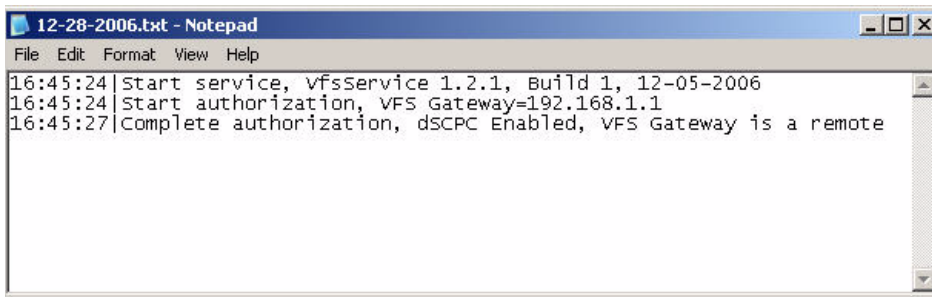
Figure 3-5 VFS Event Log, Initial

VFS Gateway

If the VFS Gateway is not connected, ensure that the correct IP address has been specified. This is the address of the Vipersat modem (e.g., CDM-570L) on the local network that serves as the gateway to the VMS.

To change the IP address, select **VFS Gateway** from the **Edit** pull-down menu to open the **Connect to VFS Gateway** dialog window and enter the new address.

Figure 3-6 Connect to VFS Gateway dialog

Once VFS has been started and authorized, the next step is to create a new session or sessions. This is described in the next section, *Creating a VFS Session*.

Creating a VFS Session

Global Configuration

The **Global Configuration** settings apply to all VFS sessions. The parameters in the Global Configuration are a subset of those that are defined during installation and setup. To modify these settings, select **Configuration** from the **Edit** pull-down menu to open the Global Configuration dialog window.

The parameters that appear will vary, depending on whether the gateway modem is a **Hub** or a **Remote**, as shown in figure 3-7 and figure 3-8, respectively.

Refer to the "VFS Setup" section on page 2-3 for more information on these parameter settings.
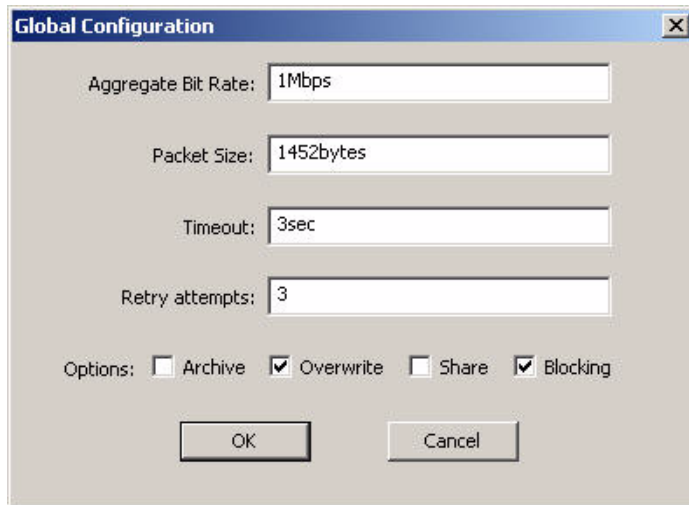
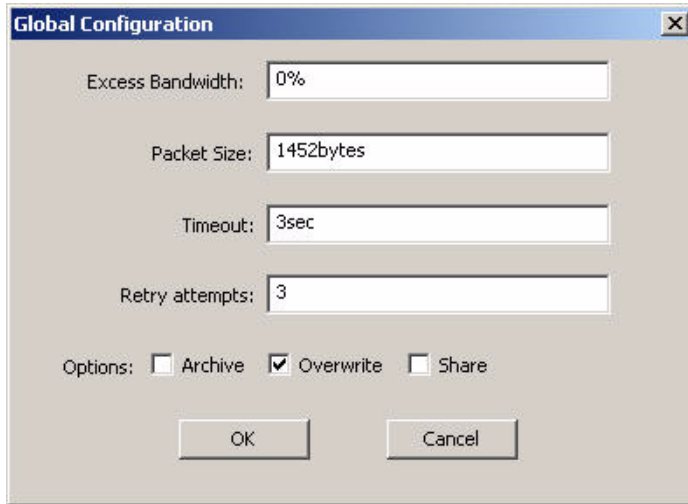**Figure 3-7** Global Configuration Settings, Hub Gateway

Figure 3-8 Global Configuration Settings, Remote Gateway

New Session

To create a new VFS session, click on the **New Session** button in the tool bar.
The **Session Configuration** window opens with the default parameter settings
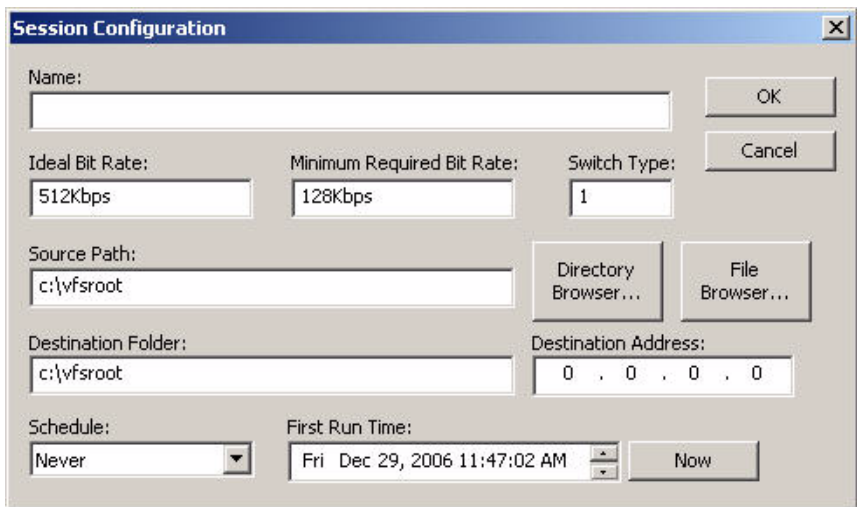for this session, as shown in figure 3-9.

Figure 3-9 Session Configuration, Remote Gateway

Note that the window appearance in this example reflects a **Remote** gateway. The default settings for a **Hub** gateway are shown in figure 3-10; since there is no switching involved for a Hub gateway, the Switch Type and Bit Rate settings are not applicable and do not appear in this window.

Figure 3-10   Session Configuration, Hub Gateway

Tip: An alternative method for creating a new session is by **dragging** the desired file/folder from its directory and **dropping** it into the *View Area* of the VFS main window. The Session Configuration window opens with the default parameter settings and the **Name** and **Source Path** fields auto-filled.

Parameter Settings

Configure the session by entering the following parameter settings:

1. Enter/Edit the **Name** for this session. This will identify the session in the *Session List* view.

2. For a *Remote* gateway, enter the **Ideal Bit Rate**, the **Minimum Required Bit Rate**, and the **Switch Type**, if different from the default settings.

Note that the specified Switch Type must be defined in the *VMS Application Policies*.

3. Enter/Edit the **Source Path**, if different from the default, for the file/folder that is to be transferred. The path can be entered manually, or the **Browser** buttons can be used to make the selection.
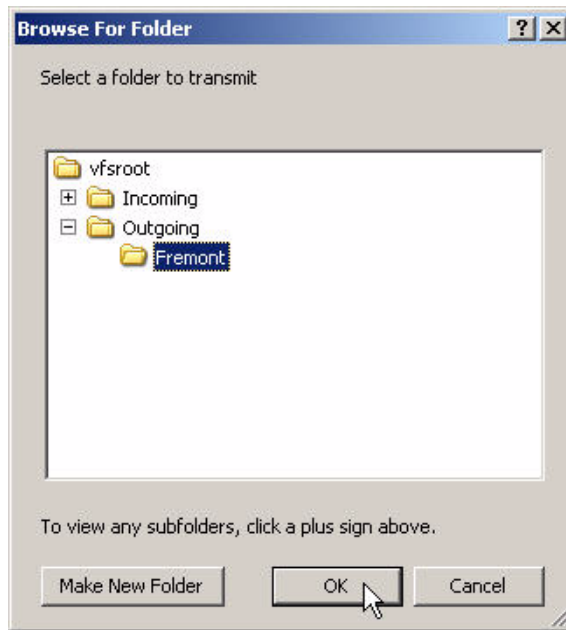
An example of using the Browser is shown below.
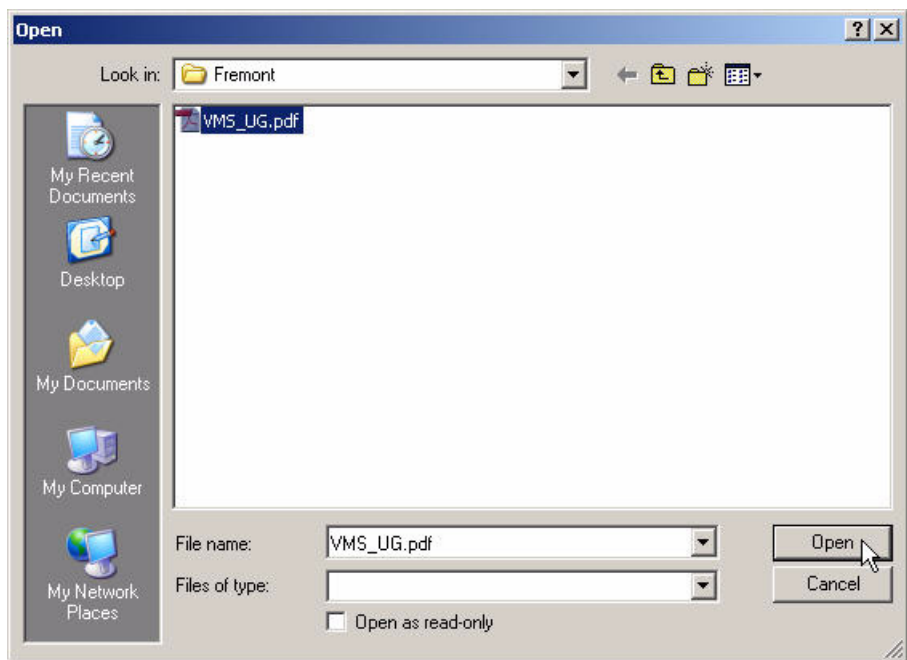
Figure 3-11 VFS Directory Browser

Figure 3-12 VFS File Browser

4. Specify the **Destination Folder**, if different from the default, on the receiving PC/workstation. This path must be entered manually—and must be valid/existing on the remote host.

5. Enter the **Destination Address**—the IP address of the NIC on the receiving PC/workstation.

6. Choose a recurring period from the **Schedule** pull-down list for this transfer. Using the default setting *Never* will prevent the session from occurring.

7. Set the date and time for the **First Run Time** for this schedule, or click on the **Now** button to begin the first transfer immediately.

NOTE

Note: In order for a VFS session to run successfully, the VFS Service must be running on both the transmitting PC/workstation and the receiving PC/workstation.

The parameter settings for a session configuration example is shown in figure 3-13, below.

Session Configuration

Name:
Fremont File Transfer

OK

Cancel

Ideal Bit Rate:
1.024Mbps

Minimum Required Bit Rate:
128Kbps

Switch Type:
1

Source Path:
C:\vfsroot\Outgoing\To Fremont\VMS_UG.pdf

Directory Browser...

File Browser...

Destination Folder:
c:\vfsroot\Incoming\From Fremont

Destination Address:
192 . 168 . 000 . 056

Schedule:
Every hour

First Run Time:
Thu Jan 4, 2007 11:17:01 AM

Now

Figure 3-13 VFS Session Configuration Example

8. Click on the **OK** button to save these parameter settings and enter this session in the *Session List* view, as shown in figure 3-14.
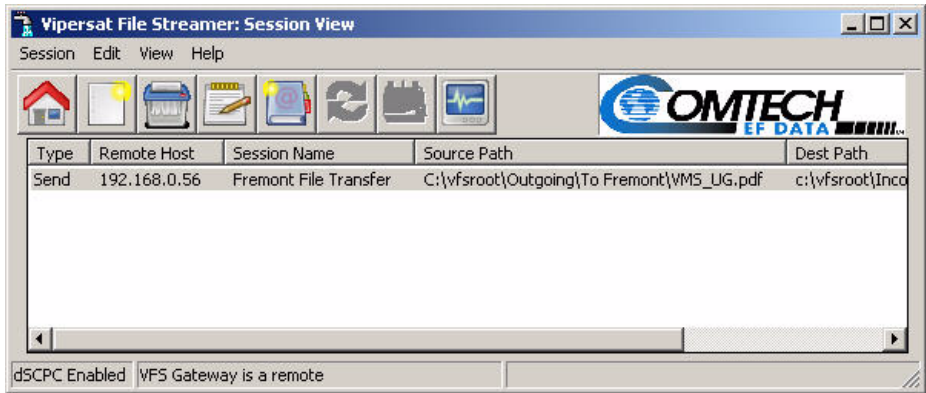
Figure 3-14 New Session Listing

Additional information—such as **Initial Time**, **Next Time**, and **Estimated Duration**—can be displayed by changing to *Schedule View*, as shown in figure 3-15.
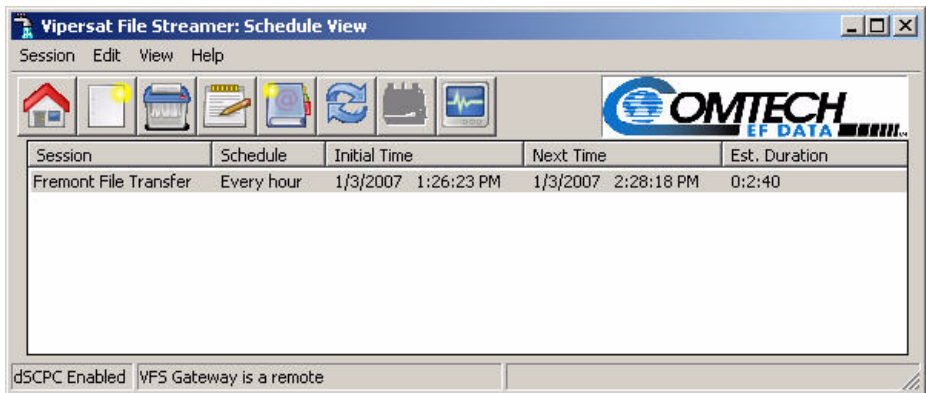
Figure 3-15 Session Listing, Schedule View

Session Progress

Once a VFS session has been created and the selected schedule time arrives, the progress of the file transfer can be observed by clicking on the **View Progress** button in the tool bar to display the *Progress View*, as shown in figure 3-16.

Figure 3-16 Progress View, Transmit

File transfer progress can be viewed from the transmitting PC/workstation as well as the receiving PC/workstation.

Progress Detail

For more detailed information, selecting **Detail** from the **View** pull-down menu displays the progress shown in figure 3-17.
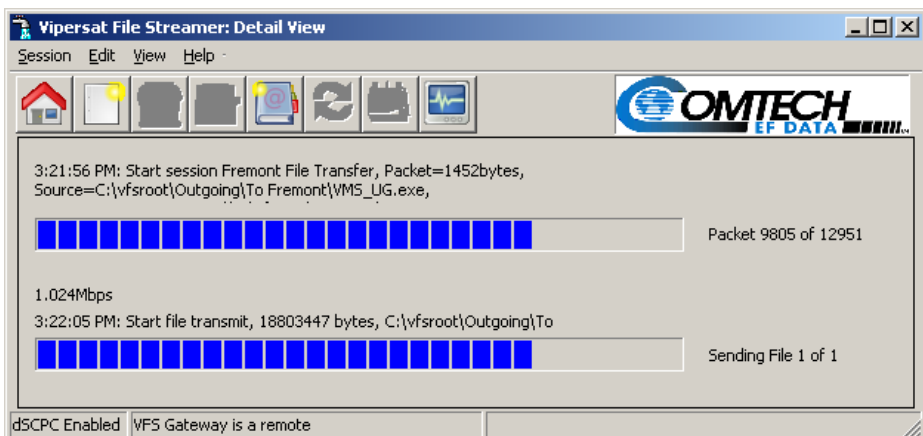
Figure 3-17 Detail Progress View, Transmit

VMS Indications

When a VFS session occurs over a Vipersat network involving automatic switching between nodes, the establishment of an SCPC carrier for the transmitting Remote can be observed using VMS ViperView.

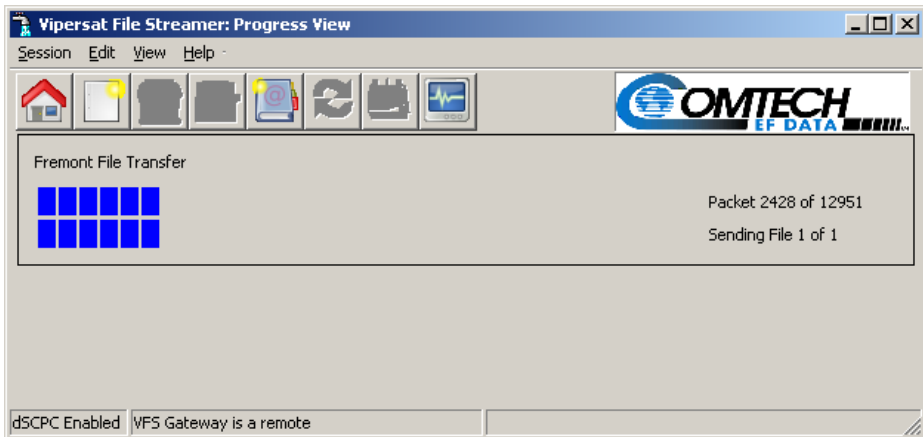The Vipersat network that has been used as an example for illustrating the functionality of VFS is shown below in figure 3-18. This represents a typical Vipersat network. In this example, an SCPC link is set up between Remote-1 and the Hub to provide the carrier for streaming the data file from a PC/workstation on the Remote-1 LAN to a PC/workstation on the Hub LAN.
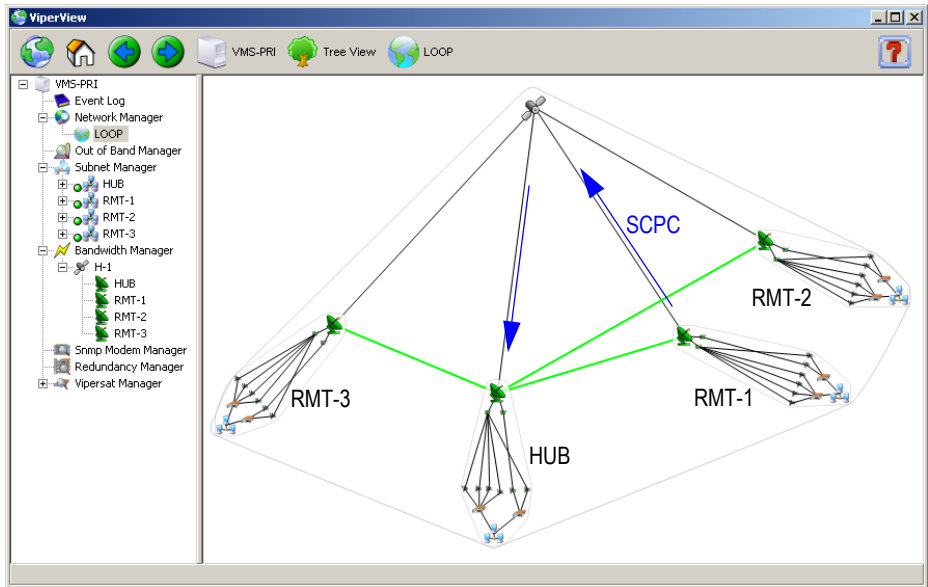
Figure 3-18   VMS, Example of Vipersat Network

The ViperView window for VMS bandwidth displays the VFS carrier, as shown in figure 3-19.
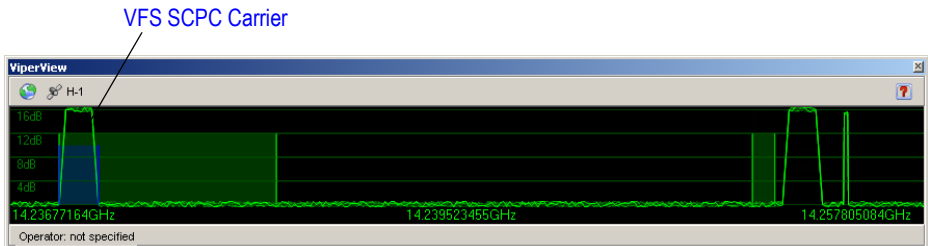
Figure 3-19   VMS Bandwidth View

Event Log

Clicking on the **View Log** button in the tool bar displays the detailed events of VFS for the current date. The event log status for the file transfer example illustrated above can be seen in figure 3-20, below.
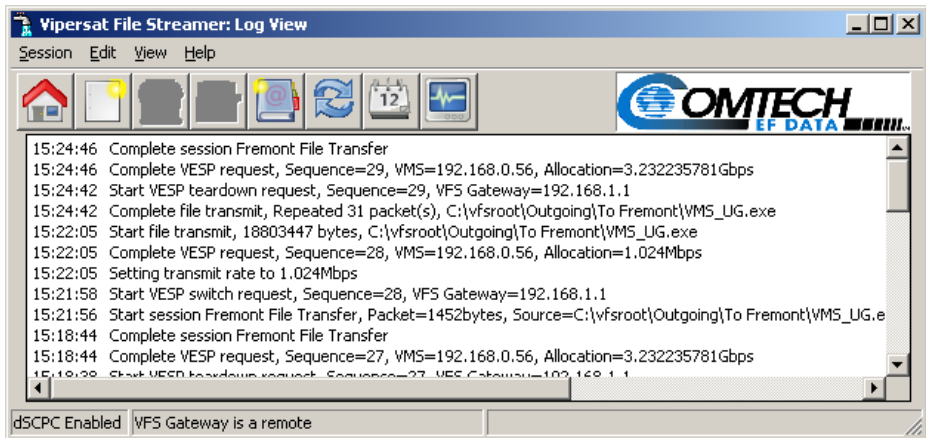
Figure 3-20   Log View, Event Status

Click on the **Refresh** button to update the view to the latest status.

Change Date

As long as the VFS Service continues to run, a new Event Log file (*-*-*.txt) is generated and saved, using the current calendar date for the file name, for every 24 hour period, beginning just after midnight.

To view the log for another date, click on the **Change Date** command button in the tool bar, then select the desired log file.

VFS Event Log files can be viewed at any time, even when WinVfs is not running. The log files are simple text (.txt) files that can be opened directly using the Windows *Notepad* application, or any other text editor.

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A

GLOSSARY

A

ALC   **A**utomatic **L**imit **C**ontrol is a closed loop mechanism controlling the gain stabilization of the HPA's RF output power.

APL   **A**synchronous **P**arty **L**ine – A VIPERSAT term for RS-485 multi-drop bus used for control of indoor equipment. See also SPL.

ARP   **A**ddress **R**esolution **P**rotocol – A protocol for a LAN device to determine the MAC address of a locally connected device given its IP address. See also MAC.

ATM   **A**synchronous **T**ransfer **M**ode

B

BER   **B**it **E**rror **R**ate (sometimes **R**atio) – A measure of the number of data bits received incorrectly compared to the total number of bits transmitted.

BUC   **B**lock **U**p **C**onverter

BPS   **B**its **P**er **S**econd – A measure of transmission speed. See also Kb/s & Mb/s.

BPSK   **B**inary **P**hase **S**hift **K**eying – A modulation technique in which the carrier is phase shifted +/- 180 degrees. See also QPSK.

C

C-Band   A frequency band commonly used for satellite communications (and sometimes terrestrial microwave). For terrestrial earth stations the receive frequency band is 3.7-4.2 GHz and transmit 5.925-6.425 GHz. See also Ku-band.

CDM   **C**omtech **D**ata **M**odem

CRC   **C**yclic **R**edundancy **C**heck – A method of applying a checksum to a block of data to determine if any errors occurred during transmission over communications links.

CXR   Carrier – A radio frequency transmission linking points and over which information may be carried.

D

DAMA   **D**emand **A**ssigned **M**ultiple **A**ccess – A process whereby communications links are only activated when there is an actual demand.

dBm   **D**eci**b**el referenced to 1 **m**illiwatt.

DHCP   The **D**ynamic **H**ost **C**onfiguration **P**rotocol is an Internet protocol for automating the configuration of computers that use TCP/IP.

DNA   **D**ynamic **N**ode **A**nnouncement – In VIPERSAT satellite networks a process whereby remote sites periodically announce their presence to facilitate network setup and monitoring.

DPC   **D**ynamic **P**ower **C**ontrol

DRAM   **D**ynamic **R**andom **A**ccess **M**emory

DSP   **D**igital **S**ignal **P**rocessor – A microprocessor chip optimized for signal processing applications.

DSCP   **D**ifferentiated **S**ervices (DiffServ) **C**ode **P**oint – a field in the header of an IP packet that is used for packet classification purposes.

DVB   **D**igital **V**ideo **B**roadcast

DVP   **D**igital **V**oice **P**rocessor – Used in packet voice applications.

E

E_b/N_o E_b/N_o is the ratio of E_b (energy per bit) and N_o (noise power density per Hz). The bit error rate (BER) for digital data is a decreasing function of this ratio. E_b is the energy of an information bit measured in Joules, or equivalently, in Watts per Hertz.

F

FAST Code   **F**ully **A**ccessible **S**ystem **T**opology Code – Designation for feature code used by Comtech EF Data for their satellite modems. The FAST method makes it easy to quickly upgrade the feature options of a modem while it is running live in the network, either on site or remotely.

FDMA   **F**requency **D**ivision **M**ultiple **A**ccess – A technique where multiple users can access a common resource (e.g. satellite) by each being allocated a distinct frequency for operation. See also TDMA.

FEC   **F**orward **E**rror **C**orrection – A process whereby data being transmitted over a communications link can have error correction bits added which may be used at the receiving end to determine/correct any transmission errors which may occur.

FIFO   **F**irst **I**n **F**irst **O**ut – A simple buffer or queue technique whereby data queued the longest is transmitted first.

FTP   **F**ile **T**ransfer **P**rotocol – An application for transferring computer files over the Internet. See also TFTP.

G

G.729   ITU standard for **LD-CELP** (**L**ow **D**elay – **C**ode **E**xcited **L**inear **P**rediction) voice encoding at 8 kb/s.

GIR   **G**uaranteed **I**nformation **R**ate

Group ID   A number assigned to equipment which defines it as a member of a group when addressed by the VMS burst controller.

GUI   **G**raphical **U**ser **I**nterface – A form of graphical shell or user interface to a computer operating system.

H

HDLC   **H**igh **L**evel **D**ata **L**ink **C**ontrol – A standard defining how data may be transmitted down a synchronous serial link.

HPA   **H**igh **P**ower **A**mplifier – The amplifier used in satellite communications to raise the transmit signal to the correct power level prior to transmission to satellite.

HTTP   **H**yper **T**ext **T**ransfer **P**rotocol – The Internet standard for **W**orld **W**ide **W**eb (**WWW**) operation.

Hub   The central site of a network which links to a number of satellite earth sites.

I

ICMP   **I**nternet **C**ontrol **M**essage **P**rotocol

IF   **I**ntermediate **F**requency – In satellite systems IF frequencies are usually centered around 70 or 140 MHz, or 1200 MHz (L-band).

IP   **I**nternet **P**rotocol – A format for data packets used on networks accessing the Internet.

ISP   **I**nternet **S**ervice **P**rovider – A company providing Internet access.

ITU   **I**nternational **T**elecommunications **U**nion

K

Kb/s   **K**ilo **b**its per **s**econd - 1000 bits/second. A measure of transmission speed. See also bps & Mb/s.

Ku-Band   A frequency band used for satellite communications. For terrestrial earth stations the receive frequency band is in the range 10.95–12.75 GHz and transmit 14.0–14.5 GHz. See also C-band.

L

L-Band A frequency band commonly used as an IF for satellite systems using block up/down conversion. Usually 950-1450 MHz.

LAN **L**ocal **A**rea **N**etwork

LLA **L**ow **L**atency **A**pplication

LNA **L**ow **N**oise **A**mplifier – An amplifier with very low noise temperature used as the first amplifier in the receive chain of a satellite system.

LNB **L**ow **N**oise **B**lock – A downconvertor so called because it converts a whole band or "block" of frequencies to a lower band. It is similar to LNA.

LNC **L**ow **N**oise **C**onverter – A combined low noise amplifier and block down converter, usually with an L-band (typically 950-1450 MHz) IF.

LO **L**ocal **O**scillator

M

M&C **M**onitor **&** **C**ontrol

MAC **M**edia **A**ccess **C**ontrol – A protocol controlling access to the physical layer of an Ethernet network.

Mb/s **M**ega **b**its per **s**econd – 1 Million bits/second. A measure of transmission speed. See also bps & kb/s.

Modem **Mod**ulator and **Dem**odulator units combined.

Multicast Transmitting a single message simultaneously to all recipients.

N

NAT **N**etwork **A**ddress **T**ranslation – An Internet standard that enables a local-area network (LAN) to use one set of IP addresses for internal traffic and a second set of addresses for external traffic.

NIC **N**etwork **I**nterface **C**ontroller – The network interface for a PC/workstation that provides Ethernet connectivity. Depending on the computer, the NIC can either

be built into the motherboard, or be an expansion card. Some computers have multiple NICs, each identified by a unique IP address.

NOC   **N**etwork **O**peration **C**enter (NOC) has access to any earth station installed using the VIPERSAT Management System (VMS). A NOC can remotely interrogate, control, and log network activities.

O

ODU   **O**utd**o**or **U**nit – In a VSAT system the RF components (transceiver) are usually installed outdoors on the antenna structure itself and are thus referred to as an ODU.

OPEX   **Op**erating **Ex**penditure

OSPF   **O**pen **S**hortest **P**ath **F**irst – A common routing algorithm.

P

PLDM   **P**ath **L**oss **D**ata **M**ulticast message is sent every sixty seconds and contains information on messages received or lost.

PMUX   **P**ort **Mu**ltiple**x**ing – Each port of the SDMS is individually configured from the NMS port (hub) to port (remote) multiplexing.

PSTN   **P**ublic **S**witched **T**elephone **N**etwork – Refers to the world's public circuit-switched telephone network governed by technical standards created by the ITU-T, using telephone numbers for addressing. A mixture of digital and analog telephone systems, the network includes mobile as well as fixed (land-line) telephones.

Q

QPSK   **Q**uaternary **P**hase **S**hift **K**eying – A modulation technique in which the carrier is phase shifted +/- 90 or +/-180 degrees. See also BPSK.

R

RF **R**adio **F**requency – A generic term for signals at frequencies above those used for baseband or IF.

RFC **R**equest **F**or **C**omment – The de-facto Internet standards issued by the Internet Engineering Task Force (IETF).

RIP **R**outing **I**nformation **P**rotocol

RS-232 A common electrical/physical standard issued by the IEEE used for point to point serial communications up to approximately 115 kb/s.

RS-485 A common electrical/physical standard issued by the IEEE used for multi-drop serial communications.

Rx **R**eceive

S

SCPC **S**ingle **C**hannel **P**er **C**arrier – A satellite communications technique where an individual carrier is transmitted to a single destination.

SNMP **S**imple **N**etwork **M**anagement **P**rotocol – A protocol defining how devices from different vendors may be managed using a common network management system.

SPL **S**ynchronous **P**arty **L**ine – An electrically isolated interface between indoor and outdoor equipment used in VIPERSAT satellite systems. See also APL.

Star Topology A network topology which, if drawn as a logical representation, resembles a star with a hub at the center.

STDMA **S**elective **T**ime **D**ivision **M**ultiple **A**ccess – A multiple access technique where users time-share access to a common channel with variable-sized time slots allocated on usage.

Streamload Protocol A proprietary Vipersat data streaming protocol used by VFS for transferring files over a Vipersat satellite network.

T

TCP/IP	**T**ransmission **C**ontrol **P**rotocol / **I**nternet **P**rotocol – A standard for networking over unreliable transmission paths. See also UDP.
TDMA	**T**ime **D**ivision **M**ultiple **A**ccess – A multiple access technique where users contend for access to a common channel on a time-shared basis. See also FDMA and STDMA.
TFTP	**T**rivial **F**ile **T**ransfer **P**rotocol – A simple file transfer protocol used over reliable transmission paths. See also FTP.
Tx	**T**ransmit

U

UDP	**U**ser **D**atagram **P**rotocol – A standard for networking over reliable transmission paths.
UDP Multicast	A multicast transmission using the UDP protocol.

V

VESP	**V**ipersat **E**xternal **S**witching **P**rotocol – A switch-request protocol which allows external VPN equipment and Real-Time proprietary applications to negotiate bandwidth requests between any two subnets on a Vipersat network.
VFS	**V**ipersat **F**ile **S**treamer – A file transfer application utilizing UDP and a proprietary Streamload protocol to transmit data across the Vipersat network.
VMS	**V**ipersat **M**anagement **S**ystem – A comprehensive M&C tool providing rapid and responsive control of Vipersat satellite networks.
VoIP	**V**oice **o**ver **IP** – The routing of voice communications over the Internet or through any IP-based network.
VOS	**V**ipersat **O**bject **S**ervice

W

Wizard   A specialized program which performs a specific function, such as installing an application.

WRED   **W**eighted **R**andom **E**arly **D**etection – A queue management algorithm with congestion avoidance capabilities and packet classification (QoS) providing prioritization.

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