Thrane & Thrane

TECHNICAL DOCUMENT

EXPLORER® – How to tweak Windows applications

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inmarsat

Document Name:	EXPLORER – How to tweak Windows applications	Revision: H

Introduction:

This document describes how the experience for the user of BGAN can be improved by optimizing and configuring the computer and the most common used applications.

Description:

This document describes how to optimize your computer and applications so they run more smoothly over high delay and low bandwidth networks such as the BGAN satellite network.
It is intended to keep the explanations in a short one to two pages description for each part.
Following will be described:

- MS Windows XP, Automatic Updates
- TCP Windows size
- Performance Enhancing Proxy (PEP)
- FTP
- E-Mail
- Internet Explorer

MS Windows XP Automatic Updates:

MS Windows XP can be optimized in different ways. First of all it is recommended to disable automatic Windows updates as this can cost huge amount of money in airtime when downloading service packs and updates over the BGAN satellite link. Background downloading of service packs etc. will slow down the connection speed for the application the end-user is using. Wait to download Windows updates until you connect your computer to the company LAN.
To disable the automatic Windows XP updates do following:

1) Go to Control Panel
2) Double-click “Automatic Updates” icon

Following window will appear:

3) Select “Notify me but don’t automatically download or install them”.
4) Press the OK button to save the new setting.

NOTE: If the setting can not be changed (greyed out) then contact your IT department; they might have protected these settings under Administrator rights.

TCP window size:

Setting the TCP window size will improve the speed over the BGAN satellite link when using TCP protocol. TCP window size is a window that defines how much unacknowledged data that can be in the “air” at a time. The default TCP window size for Windows XP is 64k Bytes. The optimal TCP window size for BGAN is 128k Bytes and can be calculated from the formula:
TCP window size = Bandwidth * Round Trip Time

For BGAN these values are:

TCP window size = 492 kb/s * 2 sec
TCP window size = 984 k bits
TCP window size ≈ 128 k Bytes

How to configure TCP window size parameters:

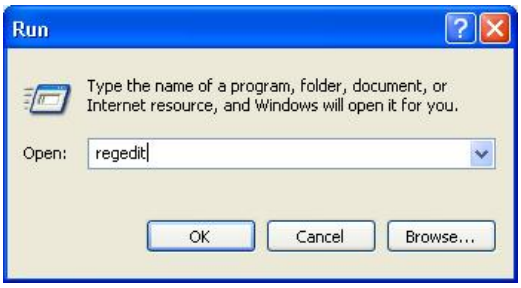
Use the following settings when configuring the TCP window size parameters.
Please ensure you re-boot after the settings have been entered.

Registry Settings:
System Key: [HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Tcpip\Parameters]

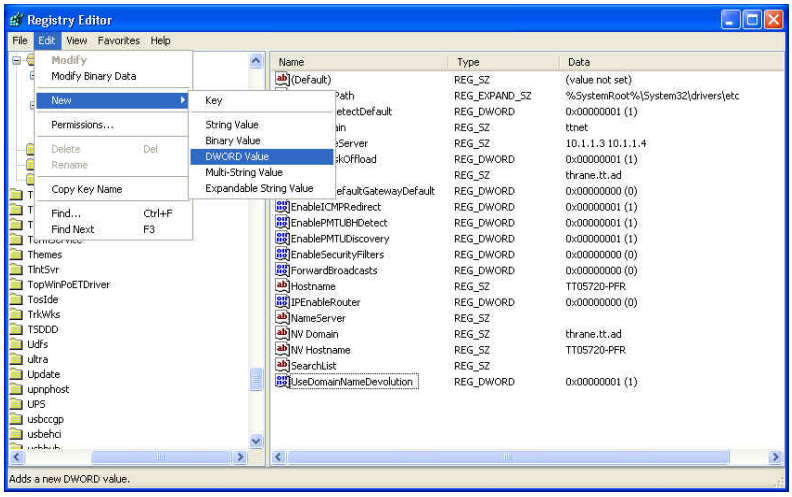
Value Name: TcpWindowSize
Data Type: DWORD Value
Value: HEX: 1FFFF

Value Name: Tcp1323Opts
Data Type: DWORD Value
Value: HEX: 1

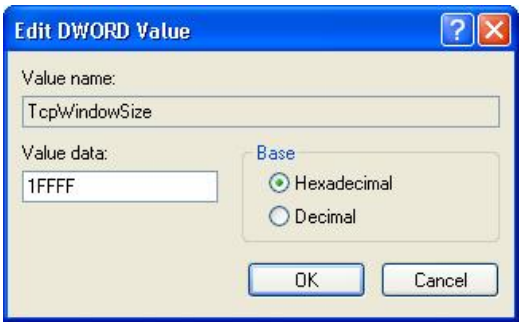
Goto <Start>, <Run> and type regedit and press OK button, see below window:



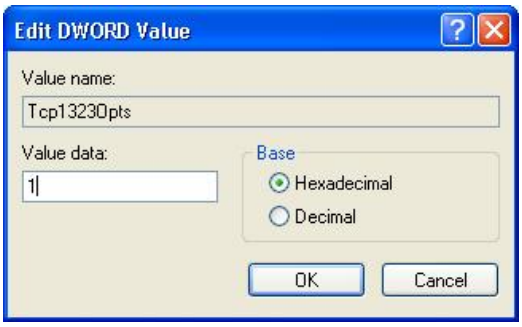
Goto HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Tcpip\Parameters directory:
Look for the variables TcpWindowSize and Tcp1323Opts. If they do not exist already create them by selecting <Edit> <New> <DWORD value>. See below screen dump.



Make a new DWORD with the name TcpWindowSize.
Edit the DWORD value by right-clicking the new DWORD, select modify and enter the value 1FFFF and press OK button. See below window:



Do the same for the new DWORD Tcp1323Opts. See below:



Now following variable should be present in the HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Tcpip\Parameters directory:

TcpWindowSize	REG_DWORD	0x0001ffff (131071)
Tcp1323Opts	REG_DWORD	0x00000001 (1)

PEP:

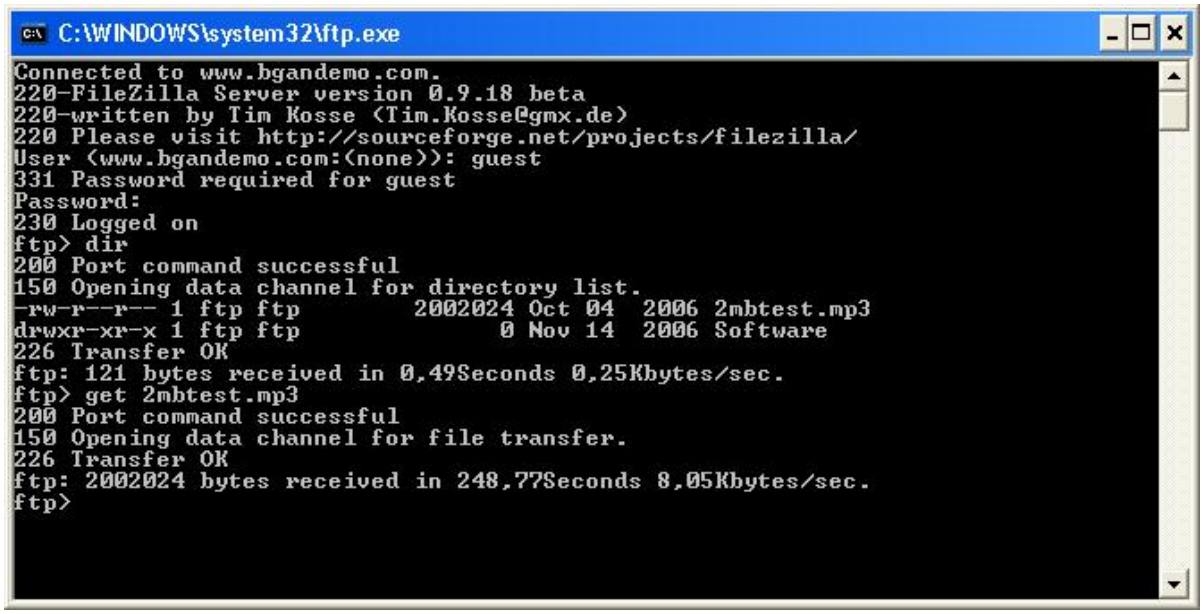
Performance Enhancing Proxy (PEP) is a mechanism to improve the end-to-end performance of communications protocol such as TCP. PEP functions by breaking the end-to-end connection into multiple connections and using different parameters to transfer data across the different legs. This allows the end systems to run unmodified and can overcome some problems with TCP window sizes on the end systems being set too low for satellite communications.
Inmarsat has implemented PEP service in their APN at bgan.inmarsat.com.
This PEP service will enhance performance from the network to the BGAN terminal. It speeds up TCP protocol for transmission of smaller files. IE: Web browsing and file downloads.
See below screen dump of the built-in web interface of the EXPLORER showing how to configure it to use the APN of Inmarsat which offers PEP service downstream to the BGAN terminal.

NOTE: Some DPs/ISPs might also offer PEP service on their APN. Please consult your DP/ISP about PEP service.

FTP:

FTP or File Transfer Protocol is used to connect two computers over the Internet so that the user of one computer can transfer files and perform file commands on the other computer.
Specifically, FTP is a commonly used protocol for exchanging files over any network that supports the TCP/IP protocol. There are two computers involved in an FTP transfer: a server and a client. The FTP server, running FTP server software, listens on the network for connection requests from other computers. The client computer, running FTP client software, initiates a connection to the server. Once connected, the client can do a number of file manipulation operations such as uploading files to the server, download files from the server, rename or delete files on the server and so on. Virtually every computer platform supports the FTP protocol. This allows any computer connected to a TCP/IP based network to manipulate files on another computer on that network regardless of which operating systems are involved (if the computers permit FTP access). There are many existing FTP client and server programs such as Filezilla, SmartFTP etc. etc.
Performance of FTP over BGAN has shown to depend on which FTP client is used. A number of tests have shown that DOS FTP is the one that offers excellent performance. DOS FTP is a part of the Windows XP system.
Start DOS FTP shell by going to <Start> <Run> and write ftp <server address>. See below example:

A DOS window will appear. Investigate the below DOS window to see how the user logs on to the FTP server, how he uses the DIR command to see the directory and uses the GET command to retrieve a file.



The file is stored default at C:\

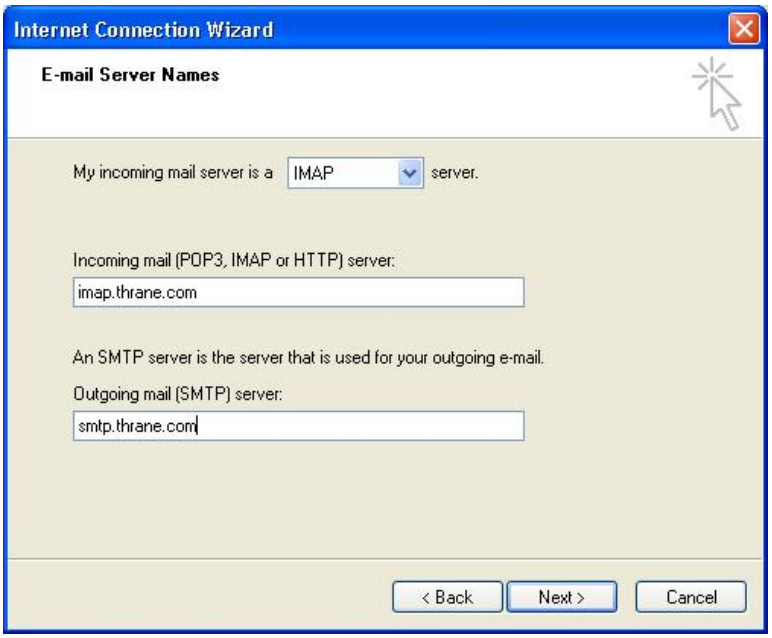
Entering ? mark will list available FTP commands.

E-mail:

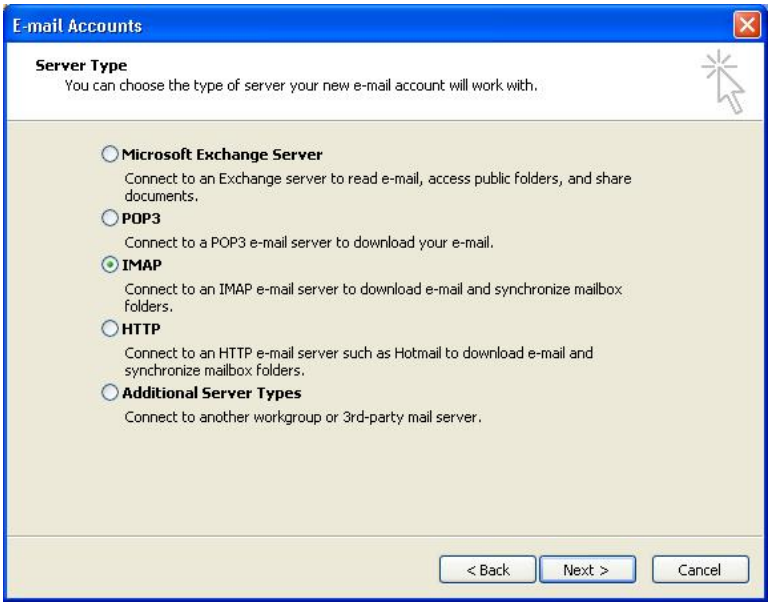
E-mail is another very popular application over BGAN. Most common used e-mail applications accesses e-mail servers using special protocols like POP3, SMTP and IMAP.
IMAP stands for Internet Message Access Protocol. E-mail stored on an IMAP server can be manipulated from a desktop computer at home, a workstation at the office, and a notebook computer while travelling, without the need to transfer messages or files back and forth between these computers. IMAP is the preferred protocol to use over BGAN as it has several advantages over POP3 and SMTP. The most important advantage is that IMAP can be configured only to download the headers of the e-mails instead of downloading the whole e-mail with attachments etc. The user can then select from the headers which e-mail to fetch. This feature can save the user for a lot of money on airtime.

Some of the most common e-mail programs under Windows XP are Outlook and Outlook Express. Configuration of IMAP is shown below:

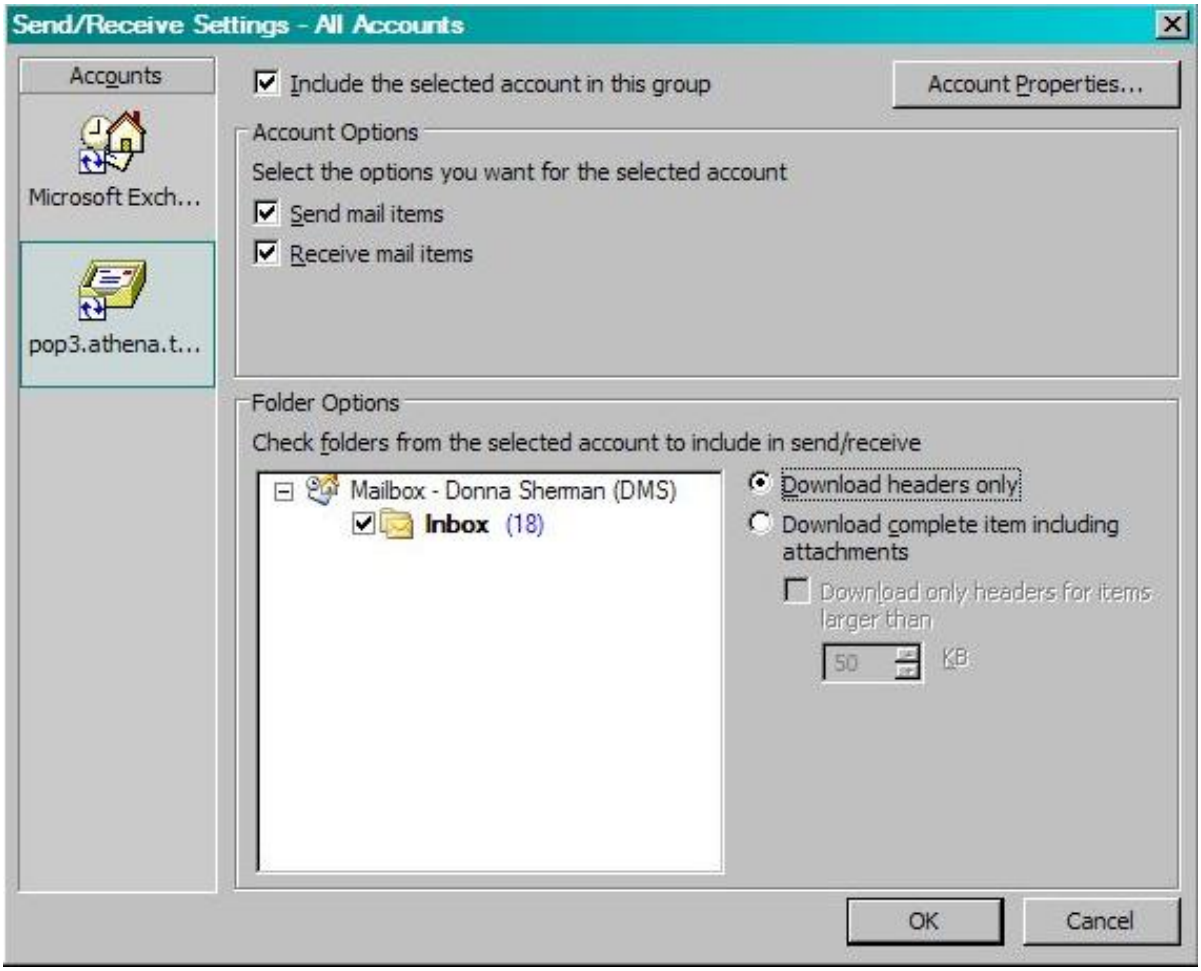
Following window shows where to configure the IMAP protocol in Outlook Express:



Following window shows where to configure the IMAP protocol in Outlook Express:



Remember also to configure your email application to “Download headers only”: See below example:

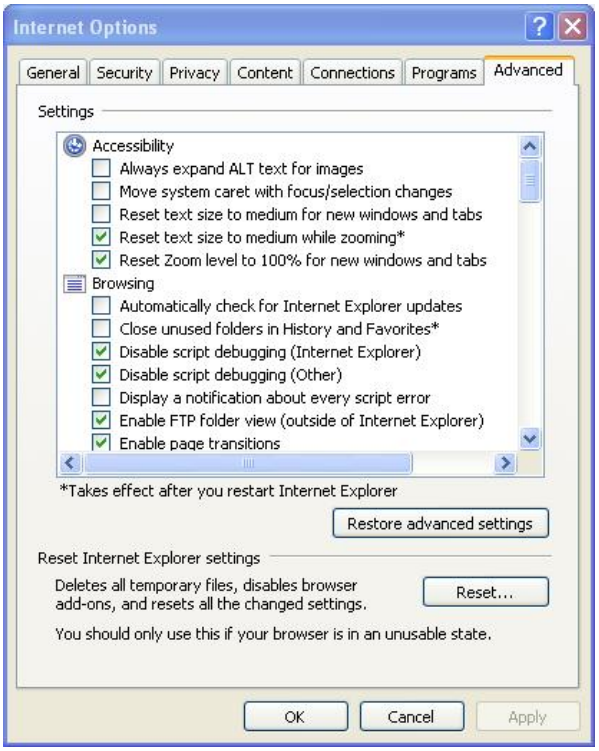


NOTE: Please contact your email service provider/it department to learn whether IMAP is supported.

Internet Explorer:

Internet browsing can be optimized a great deal by disabling features such as showing pictures, playing movies, audio etc. This page will show example of which features can be deselected in MS Internet Explorer. There might be similar settings in other web browser applications.

Start the Internet Explorer and goto <Tools>,<Internet Options>,<Advanced> to open following window:



Go in to the settings list and de-select appropriate features that can save bandwidth and airtime, such as:

“Automatically check for Internet Explorer updates”

“Play animations in webpages”

“Play sounds in webpages”

“Show pictures”

It is up to the user to decide which features that he or she wants to disable and can work without.

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