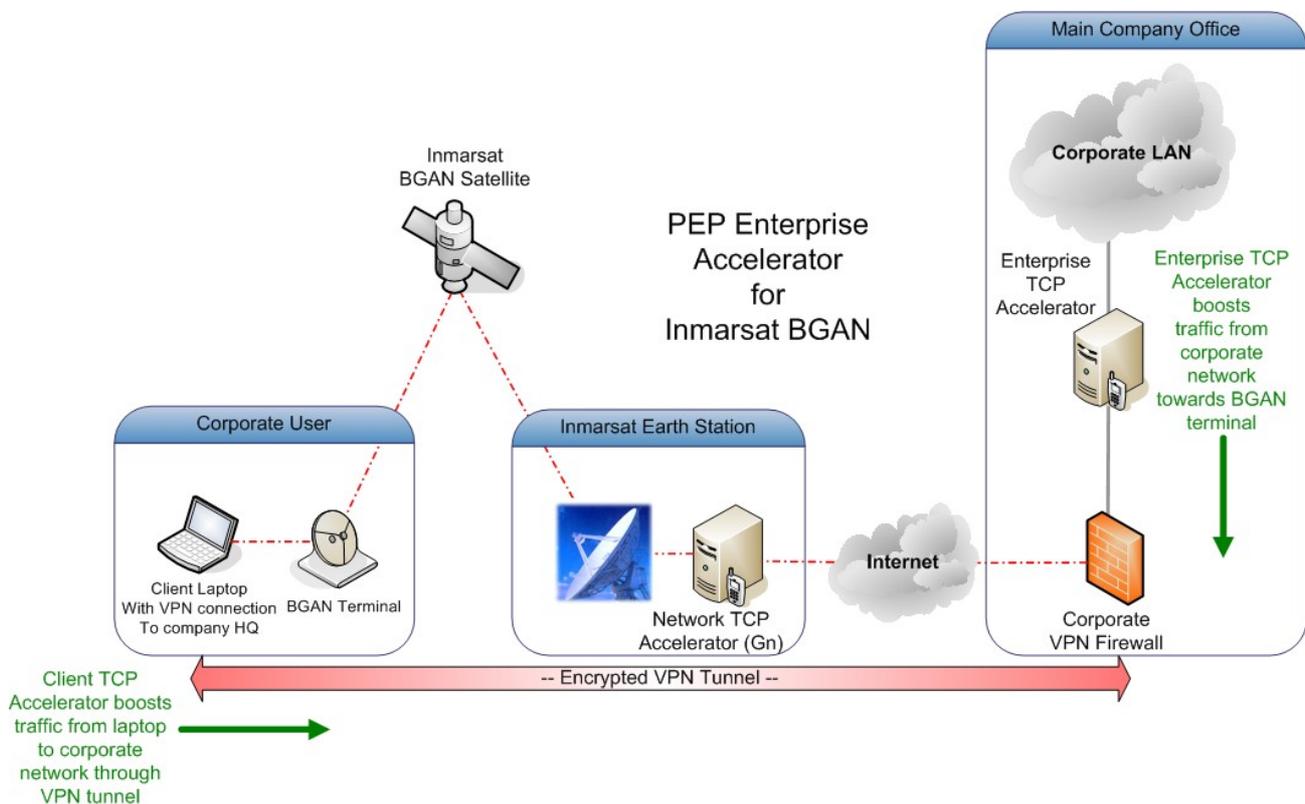# Implementing the Enterprise TCP Accelerator for BGAN

Version 1.0
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Overview

- The Enterprise PEP TCP Accelerator is a solution which has been designed by Inmarsat for the BGAN network. Its primary purpose is to accelerate traffic from corporate sites to remote users, who require encryption on their company's network traffic end-to-end.

  Regular BGAN traffic is accelerated in the download direction by the Network TCP Accelerator located at Inmarsat's earth stations. However, encrypted traffic, such as VPN tunnels or HTTPS (SSL) web pages are not accelerated.

For a company which has a large number of BGAN users in remote areas, the Enterprise Accelerator is ideal for enhancing the speed of its remote user's corporate traffic before it enters an encryption domain.

The Accelerator is designed to operate seamlessly within the enterprise network and has been tested over several big vendor VPN products; Checkpoint, Cisco, Nortel and Juniper firewalls.

Product Range

Enterprise Accelerator has been extensively tested across the BGAN terminal range:
- Hughes 9201 and 9250.
- Thrane & Thrane EXPLORER 300, 500, 527 and 700.
- Nera WorldPro 1000 and 1010.
- Addvalue SABRE 1.

Requirements

The Enterprise Accelerator is designed to operate on a dedicated server, which bridges the link between a corporate firewall and the corporate LAN. It requires the following:

- Dedicated server with at least 3.2Ghz processor (2mb cache) and 1GB of RAM.
- 2 ethernet NIC interfaces of the BCM 5700 type.
- At least 20Gb of disk space
- RedHat Enterprise Server v.3 installed.

The Accelerator operates under a specially adapted Linux kernel (2.4-26) which needs to be upgraded from the original RH ES3 kernel. The software is then installed along with a suite of SNMP agents used for monitoring and control of the Accelerator system service.

Key Features

TCP Accelerator offers the following features over the BGAN network:
- Fully compatible with the major VPN vendors. Checkpoint, Cisco, Nortel and Juniper Netscreen firewalls have all been tested extensively in enterprise environments.
- It's an enterprise solution capable of catering to hundreds of connections and a peak data rate of ~86Mbps. It is highly reliable with 90% capacity utilization.
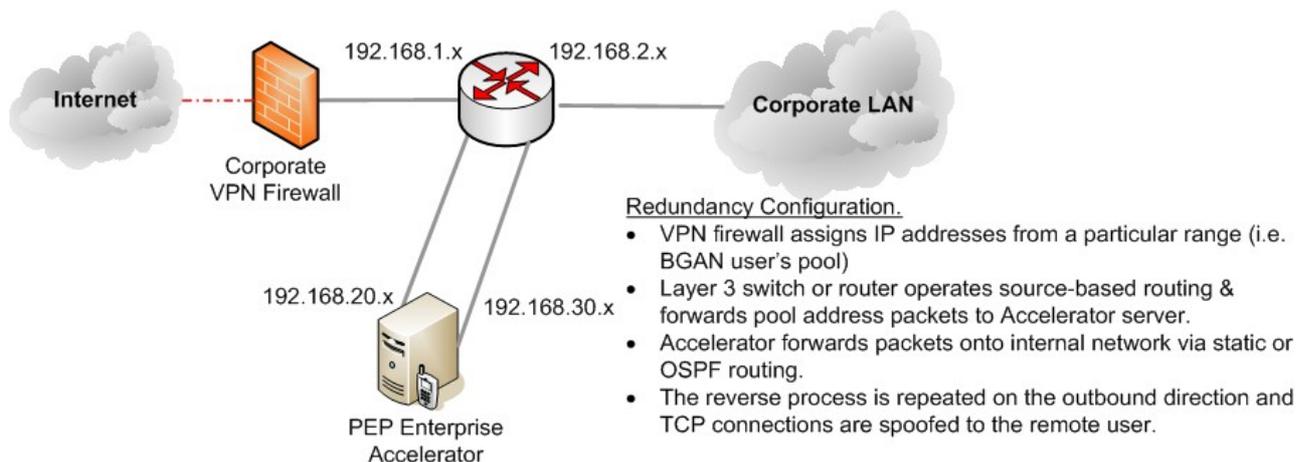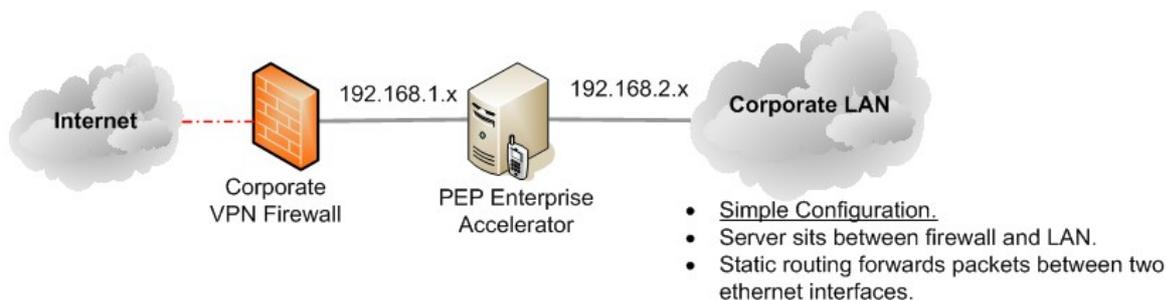
Benefits to BGAN users

The Enterprise Accelerator software boosts the download speed of all TCP traffic by up to 300% (depending on file size), with an average increase across all applications of 70%.

- Increased speed in email protocols downloaded from the corporate site servers. Microsoft Exchange, Lotus Notes and POP3 protocols report considerable improvements.
- HTTP web pages (Internet Explorer, Firefox, Opera etc) offer more responsive intranet web page browsing.
- Significantly increased file download speeds on FTP based programs or via P2P file sharing.
- Better SAMBA (Windows file sharing) performance.
- Increased TCP performance overall, using adjusted TCP windows spoofing and extended timeouts which are optimised for the BGAN network.

Proposed network locations

There are several theoretical locations for the Accelerator server to sit inside the company network, depending on the requirements of redundancy or a simplified network topology.

Internet — Corporate VPN Firewall — 192.168.1.x — PEP Enterprise Accelerator — 192.168.2.x — Corporate LAN

- Simple Configuration.
- Server sits between firewall and LAN.
- Static routing forwards packets between two ethernet interfaces.

Internet — Corporate VPN Firewall — 192.168.1.x — 192.168.2.x — Corporate LAN

192.168.20.x — 192.168.30.x — PEP Enterprise Accelerator

Redundancy Configuration.
- VPN firewall assigns IP addresses from a particular range (i.e. BGAN user's pool)
- Layer 3 switch or router operates source-based routing & forwards pool address packets to Accelerator server.
- Accelerator forwards packets onto internal network via static or OSPF routing.
- The reverse process is repeated on the outbound direction and TCP connections are spoofed to the remote user.

Technical Summary

Some of the TCP Accelerator technical feature sets are summarized below:

Feature Set	Description
Proxy Connection	The Enterprise Accelerator server splits the TCP link into two connections. One is a high-delay, satellite packet data link and the other is a terrestrial (internet) link. TCP Accelerator operates each link separately, controlling the flow of data on the link over which it is operating. It has separate built-in algorithms which optimize performance on high-delay, satellite/wireless links. The Accelerator buffers the data in advance over the terrestrial side by locally acknowledging it. Then it uses its own algorithms to transmit TCP at a faster rate.
TCP Optimal Flow	The TCP Accelerator works around various standard TCP limitations in order to optimise performance over the satellite link. It's functions are : • Removes the TCP 'slow start' mechanism • Uses better congestion window/bandwidth estimation algorithms which are based on round trip time estimations rather than packet drops. • Employs algorithms which fairly divide the bandwidth in multiple user scenarios. • Smoothens out the effect of round trip delay variations which can easily occur on a satellite link.
TCP Window Spoofing	The Enterprise Accelerator server spoofs the TCP window size of the destination server, which increases the amount of TCP packets "in flight" at any time.

Further details and support

Further reading:
User manual for Enterprise TCP Accelerator is available for download from the Inmarsat web site, at **www.inmarsat.com**. Click on the **Support** tab, then from the left-side column select **BGAN**, then **TCP accelerator** to open TCP Accelerator web page. Choose the user manual you require.

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