



Traffic Optimization for Satellite Communication

Smart Accelerated Transfer Allows High Bandwidths

In some areas, satellite communication is the only option: wind turbines in remote regions, ships at sea, or also distant troop locations abroad often cannot be contacted via terrestrial networks – yet here, too, there is a need for communication. For example, a wind energy system’s operating data must be accessed on a daily basis, a manufacturer of the marine diesel engine might want to undertake remote-controlled maintenance work, and a troop location must be reliably linked to central applications such as logistics and executive information systems.

The Challenge: Exploit the Bandwidth

Establishing stable satellite paths poses no problems these days – instead, the challenge is the efficient exploitation of the bandwidth. This is because your data packets have to travel a great distance: the satellites are in orbit approximately 36,000 km above the earth, and the packets are sent to them and then sent back down to the recipient. The reliability of the TCP transmission protocol is based on the fact that the sender always receives confirmation of the successful reception of a certain volume of data before any further packets are sent. Thus, the confirmation travels via satellite in the opposite direction back to the sender.

A Large Distance Delays Data Transfer

Waiting for the TCP response – a matter of just a few fractions of a second in the case of terrestrial networks – becomes a problem in satellite communication. The long-

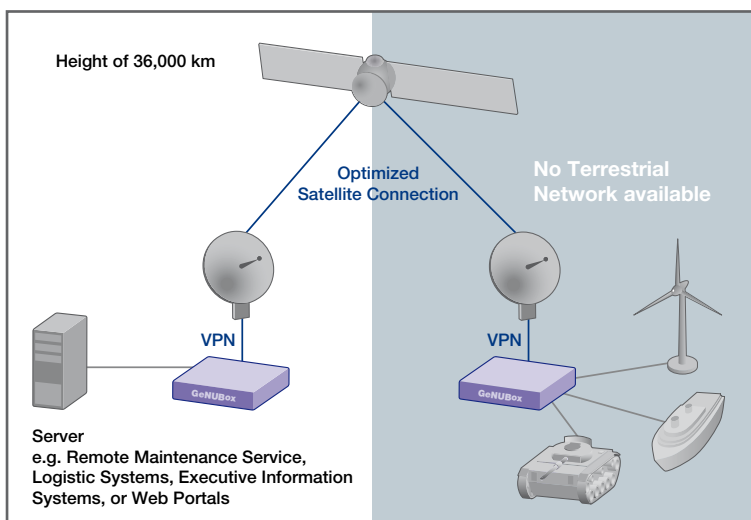
distance outward and return journeys add up to a round trip time of one to two seconds. This significantly delays the sending of the next packet, and thus the entire data transfer: a maximum data throughput of only 100 to 150 kbit/s is achieved, although these days satellite connections offer much higher bandwidths. The result are long transfer times and high costs. Satellite service operators will therefore offer you the option of compressing your data in order to make better use of the actually available bandwidth. However, this is not a solution, since only unencrypted data can be compressed. You would therefore have to send your data to the provider as plain text, which is something you should never do.



Increases transfer speed:
Compact Security Platform GeNUBox

High Bandwidth Thanks to Optimization of Data Traffic

GeNUA has developed a data traffic optimization feature for much faster and securely encrypted communication via satellite. This solution is integrated into the GeNUBox security platform and the GeNUScreen firewall, which are installed at the path’s end points. And how do we optimize satellite communication? By using several cleverly combined mechanisms. We have adapted the TCP procedure to meet the requirements of the satellite paths: through targeted intervention, even into the TCP stack, more data can be sent in quick succession without the risk of losing packets. In addition, a strong compression factor reduces the data to as little as 1/10 of their size, and encryption with AES then creates a completely secure Virtual Private Network (VPN). This optimized data flow can be transferred via satellite paths at high speeds – in favorable conditions, the transfer speed is increased 20-fold. This means you can achieve transfer rates above the nominal bandwidth.





Data Communication in Both Directions

Since our solution puts the end points of the optimized connection into your own hands, you can always use the path in both directions, e.g. to access operating data from a serviced machine and then send control commands back to it. By contrast, conventional satellite connections often work with internal addresses that remain hidden from the user. Data transfer in the opposite direction is not possible in this situation. In addition, our solution provides secure authentication by means of RSA and makes it possible to link individual work stations and maintained machinery, or even entire networks.

GeNUBox and GeNUScreen Offer even More

You benefit from even more advantages by using the GeNUBox security platform and the GeNUScreen firewall. The GeNUBox provides an integrated application platform on which you can install individual applications that you want to run on the serviced machinery on site: monitoring, maintenance, or also control programs. The GeNUScreen firewall allows sophisticated filtering of the entire data traffic. It thus reliably protects the interface between your LAN and public networks.

For military applications, it is also of significance that GeNUScreen will soon be approved for the VS-NfD classification ("restricted"). In addition, we can achieve higher classification levels by supplying auxiliary systems.

This Allows Connections e.g. with:

- Machinery in remote regions, e.g. wind turbines, oil-drilling installations, or pump stations
- Relief organizations in disaster areas
- Teams of journalists deployed abroad
- Remote research and measurement stations
- Ships at sea
- Military units on deployment

Your Benefits from our Solution:

- Faster data transfer via satellite
- High bandwidth and low connection costs
- Integrated firewall for controlling connections
- Securely encrypted communication
- Data transfer in both directions
- Linking of individual remote stations or entire networks
- Remote maintenance functions with GeNUBox
- Firewall functions with GeNUScreen

About GeNUA

GeNUA, Gesellschaft für Netzwerk- und Unix-Administration, is a German company specialized for IT security. Since the company was founded in 1992, we have specialized in providing sophisticated solutions to protect networks. Our products and services include firewall systems certified by the German Federal Office for Information Security (BSI), high-security gateways for red-black transitions, VPN and remote maintenance solutions, data optimization for satellite communication, and an extensive range of services. Many companies and security-conscious public authorities trust GeNUA to protect their IT systems.