KVH TracPhone®

Understanding Satellite Communications Data Rates & Fair Access Policies

The TracPhone® V7 and the mini-VSAT Broadband℠ service offer a powerful communications solution with outstanding bandwidth and associated data rates at an affordable cost. Here are a few quick and easy things to remember when it comes to bandwidth and data rates for your TracPhone V7, or other satellite communication systems.

Q&A:

When I subscribe to mini-VSAT Broadband, what do I get?

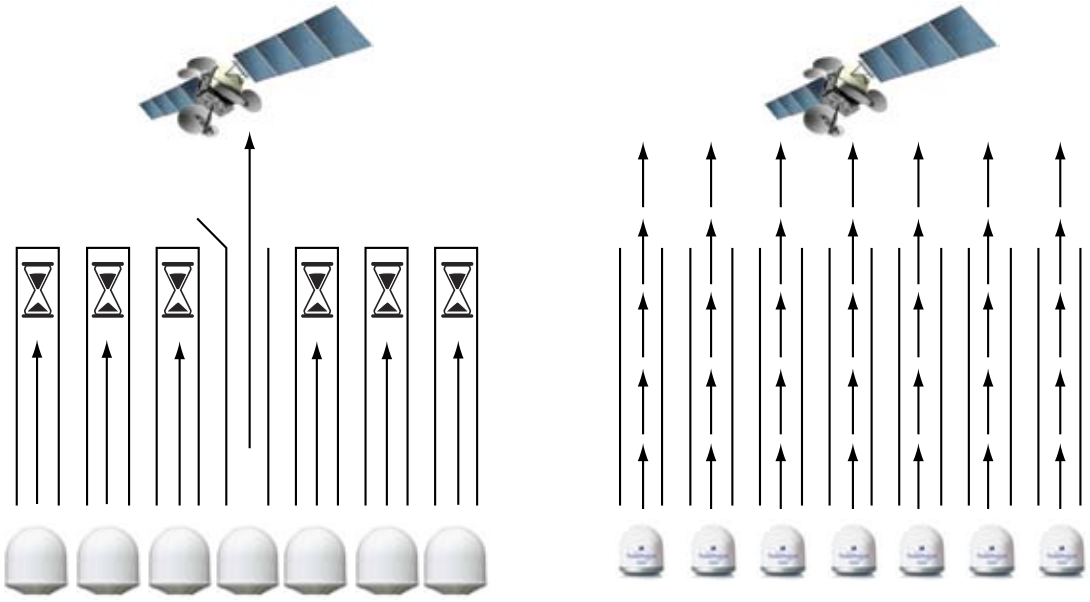
The mini-VSAT Broadband service is a shared service that allows you to transmit and receive data (e.g., e-mail, Internet pages, VoIP calls, etc.) via a channel with bandwidth allocated based on your selected rate plan. Other popular services like Inmarsat mini-M, Fleet, FleetBroadband and iDirect-based VSAT options are also shared services, meaning that you are sharing the total bandwidth of the channel with other users in your region. The maximum bandwidth currently available via mini-VSAT Broadband is 512 Kbps (kilobits per second) uploads and 2 Mbps (megabits per second) downloads.

How many people am I sharing the channel with?

The ratio of users sharing a single source of bandwidth is expressed as the contention ratio. While mini-VSAT Broadband airtime service operates in a different manner from legacy VSAT and other satellite communication systems, you will experience the equivalent to a traditional contention ratio of no more than 8 users per channel (8:1).

Will I experience any delays in my transmissions due to contention?

Not with mini-VSAT Broadband. Other networks share bandwidth among users through the use of fixed time interval assignments in which your transmission is delayed while everyone in line ahead of you goes first. With mini-VSAT Broadband, KVH and ViaSat use a new approach called Code Reuse Multiple Access (CRMA) to reduce the delays experienced by other services by sending information immediately in “bursts” at the fastest possible data rate.



VSAT Systems using Fixed-assignment TDMA

mini-VSAT Broadband Systems

Where other satcom services divide their bandwidth into time slots and allow one transmission at a time, mini-VSAT Broadband’s CRMA technology enables users to transmit a constant stream of data bursts, eliminating delays in transmission.

Q&A (continued):

Are there other factors that affect actual data rates?

Delivery of mini-VSAT Broadband communications services over a satellite uses an uplink technology known as Asynchronous Transfer Mode (ATM), which uses a portion of the dedicated bandwidth. The data transmissions themselves rely on the Transmission Control Protocol/Internet Protocol (TCP/IP). All satellite communications systems are also affected by latency, which is caused by the distance to and from the satellites.

How does latency affect my communications?

As with all geo-stationary satellite services, mini-VSAT Broadband uses satellites that are 36,000 km above the Equator. Even at the speed of light, the travel time from the boat to the satellite and to the ground station is about ¼ second, a delay known as latency. As a result, sending a message from ship to shore and receiving a reply experiences a ½ second transmission delay. While that doesn't sound like much, it can cause issues with TCP/IP communications, which interpret transmission delays as signals to slow down the data rate.

What is TCP/IP and why is it important when talking about data rates and satellite communications?

TCP/IP is the basic communications language of the Internet, converting a message or file into smaller packets that are transmitted over the Internet and received and reassembled at the correct destination. Each data packet is assigned a header with identifying information that also increases the size of the file to be transmitted.

Is it possible to test the data rates I'm getting using TracPhone V7?

Most online "speed test" sites like SpeedTest.net aren't designed to account for the issues faced by satellite communications.

We also find that speed tests of the simpler UDP provide more accurate data than TCP/IP in these tests.

When testing data speeds, it's also useful to recognise how Internet traffic and congestion may affect data rates for all users. Here's a good resource: http://www.internettrafficreport.com/

Other Resources

Want to know more about the TracPhone V7 and mini-VSAT Broadband technology? Download our free paper, "TracPhone V7 and mini-VSAT Broadband Service: What Broadband at Sea was Meant to Be" from: http://www.kvh.com/whitepapers

Designed for use with land-based connections, TCP/IP automatically adjusts based on feedback from the network. This means that a PC sending data will transmit a few packets and then wait for confirmation that the data was received before it sends any more. The transmission rate will increase until the PC no longer receives a confirmation, an indicator of the maximum network speed, and new transmissions will be sent at that speed.

In the eyes of the transmitting PC's TCP/IP connection, however, the delays caused by latency in satellite communications can appear to be a very slow, congested network. When the PC doesn't get the confirmation in a specific time, it will slow down the transmission rate and try again, even though the network is not experiencing any congestion. To overcome some of these TCP/IP issues, the mini-VSAT Broadband service uses acceleration tools that strip off the TCP/IP-created header, reducing the file size and minimising the slowdowns within the TCP/IP process.

So what does all this mean with regard to the upload speeds I'll enjoy?

Taking into account the shared channel, ATM, and TCP/IP, the end result is that you can expect upload speeds 70-80% of the maximum channel bandwidth when using mini-VSAT Broadband, providing you with data connections equivalent to a DSL connection while at sea.

Fair Access Policies

Regulating Satellite Communications Use for Reliable Communications for All Users

How does KVH manage its mini-VSAT Broadband network to ensure optimal performance for all subscribers?

KVH works diligently to manage network traffic and usage to ensure constant performance for all users. This practice is critical for shared networks like mini-VSAT Broadband, as it allows the service provider to ensure the best online experience possible for all customers.

An integral part of this network management is the Fair Access Policy (FAP), which sets reasonable parameters for data use while identifying bandwidth-heavy applications that degrade network performance for all users. This policy ensures proper use of bandwidth among all subscribers, preventing behaviors that compromise the fast, reliable speeds that customers expect. The vast majority of users do not come close to exceeding FAP limits, even with normal use that includes web browsing, e-mail, and other day-to-day applications.

The FAP includes a list of applications that subscribers should avoid, as they consume very large amounts of data and can easily exceed the FAP threshold. Those applications include peer-to-peer file sharing (LimeWire or BitTorrent, for example), streaming video, and other super-high-use applications.

Do other service providers have FAP limits?

Yes, they all do. As a matter of fact, with many providers you may not know you've exceeded your plan's FAP limits until you notice a dramatic decrease in performance. This is because, following excessive use, your access to the network is restricted, slowing your data rates. Providers often take this action without notifying the customer – it's explained in the fine print of your service agreement.

At KVH, we notify customers who approach or exceed FAP limits, so that we can work with you to find options for decreasing use or choosing an alternate rate plan to accommodate your needs. Best of all, we understand that megabytes are not always the first thing on your mind, so your first overage is on us. We'll notify you of your exact overages when and if they occur, provide some options, and give you time to choose the best resolution before we charge a penny or make any changes to your service.

So what CAN I do online while abiding by the FAP?

KVH's FAP allows subscribers to engage in common online activities without approaching the limit. For example, you can:

- Download weather maps
- Visit websites (like www.kvh.com!)
- Make hundreds of phone calls every month
- Chat with friends using instant-message programs
- Send and receive text and HTML e-mails
- Log into corporate networks for secure file access
- Send and receive text messages

How can I avoid exceeding the FAP limits?

1. Upgrade to a higher data package and receive a higher data volume allowance per month.
2. Curtail the use of applications that result in peer-to-peer file sharing, streaming video, or similar services.
3. Pay $0.99 per megabyte for data overages for those months that exhibit excessive data consumption going forward.
4. Contact the KVH sales team to discuss other options on a case-by-case basis, such as blocking certain applications.

What if I routinely exceed the FAP limits for my airtime plan with my normal activities?

Luckily for mini-VSAT Broadband subscribers, there are several airtime plans available to suit the needs of our subscribers. Check out the airtime rate sheet or contact our Airtime Services Group to find the plan that's best for you.

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