

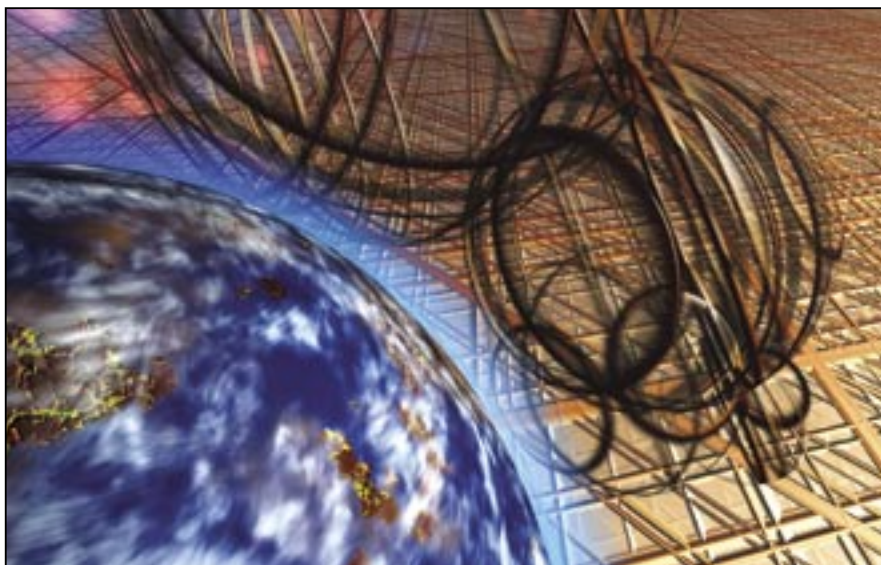


VSAT Part 2

VSAT Networks And Their Use In The Lodging And MDU Markets

By Greg Heifner ■ *Orbital Data Net, Inc.*

For the first few years of satellite data services, it was common knowledge that VSAT (very small aperture terminal) satellite connections were not very “IP” friendly. They made poor connections to the Internet and were generally considered unacceptable for that use, except for the most desperate or technology addicted soles. The second category would best describe myself when I tried to establish broadband Internet access on my wild-life area/horse farm several years ago. This was during a phase when I had decided to go seriously rural, but had to be high tech about it all at the same time. Folks that owned farm implement stores in rural Missouri began to call me Mr. Douglas and ask if my pig Arnold was in the truck with me. Funny thing is that I had the last laugh when they came to me to hook their farm implement store to the Internet by satellite, so they could order parts online through a secure web server. They had tried a residential satellite service, which will remain nameless (rhymes with Amway) and were unsatisfied with the



of the side effects present with satellite connectivity and latency. However, times have changed and the coding algorithms used in some satellite VSAT networks have made enormous improvements to the overall broadband connection experience via satellite.

As I described in the March 2004 issue, there are currently three distinct flavors of satellite transmission of data

of data sent under conditions that other forms of connectivity cannot support. These type connections are limited in bandwidth so they should only be considered when a small footprint antenna and mobility are needed. The satellite phone/data products we support also commonly mesh into the available cellular networks as well and will fail over to the best quality signal.

What most operators will be exposed to is the other two types of networks in use, SCPC and STAR type networks. In the case of the single channel per carrier type network (SCPC), like our ODN-Starburst product, the connection can be either dedicated or shared capacity. In the case of a STAR based network such as the one we offer from Spacenet (Connexstar™) it is a shared network only.

Let’s talk about what to expect. Dedicated circuits, such as the T1 that a telco would provide are a simple pipeline from you to the open Internet or some other termination point. It is reserved for you only and there is no

“...times have changed and the coding algorithms used in some satellite VSAT networks have made enormous improvements to the overall broadband connection experience via satellite.”

performance, so they wanted to know if there were options other than going back to dial up. I still don’t know much about plows, but this was something I knew about.

Most VSAT satellite hubs initially were doing what was known as “IP spoofing” which helped to reduce some

(VSAT) that are in general use. Mesh systems, such as the GlobalStar Network, famous for satellite telephony are used by Orbital Data Net for mobile applications such as our new ODN-Raptor product. Services like this are used by law enforcement and emergency vehicles that need small packets

sharing. When you are not using it, it is sitting there idle. For most property network operators, this is a great way to tie your broadband network into the open Internet if you have enough customers to justify the price. In some areas, it is scalable, but often, you just get what you can get. Terrestrial connections like the T1 are very geographically sensitive (VSAT is ubiquitous), which means that your property in Reno, Nevada might cost \$500/month for a T1, but the same circuit at your other property at Lake Tahoe very well might cost \$1,800 month. Cost is based on demand and the facilities the phone company has in place. In some very limited areas you might not be able to obtain a T1 for any price. In these instances we recommend using something like our VSAT connection as it can completely replace or augment a terrestrial connection.

Another advantage of VSAT is scalability. It is sometimes difficult to obtain a fractional T1 when you don't need the whole capacity of a T1 yet. The inverse can also be true when needing to add more capacity; you may not get what you need. For example; the ODN-StarBurst type of VSAT is scalable from 32kbps to 5mbps whereas fractional T1's or data rates higher than T1 capacity may not be available. Almost any properly designed VSAT connection can be scaled up and down from the remote hub facility, at your request. VSAT can also be used in a hybrid system where the terrestrial circuit handles normal traffic, while the VSAT handles all burst loads and provides a redundant failover in case the terrestrial connection fails. Of course all our VSAT technology handles VPN (virtual private networks) so the main offices can also use the technology as secure extensions of their corporate WAN (wide area network) for reservations, credit verification and other uses. Dedicated circuits, as well as our VSAT network can offer a QOS (quality of service) number called CIR (certified information rate). This data rate describes exactly what to expect in the performance of this circuit. ODN VSAT networks

also offer 3DES and AES encryption.

Almost all VSAT modem hardware provides a standard Ethernet connection and can be plugged directly into the networks gateway, just as a terrestrial connection can be. Whenever using any type of modem or router to make this trunk connection, using a good quality UPS can reduce problems.

Dedicated connections such as T1's are generally used to provide the "trunk" a network uses to tie back into the Internet cloud. Shared networks are what all our computers at home and office are connected to. Cable modem, wireless, DSL, powerline and many versions of satellite VSAT are shared technologies used simply to make the

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bandwidth available affordable. How they are shared and how many users are shared within one data stream is generally referred to as a subscription ratio in its simplest form, this is how many customers share any one data stream. An example might be a carrier that offers a DSL package that has advertised bandwidth characteristics of 512kbps download and 128kbps upload. They may or may not tell you how many other subscribers share that connection with you. In some cases it could be

“Satellite VSAT has a hidden advantage that even if you have subscribed to a package that tops out at 512/128kbps, for instance, you might see file transfers magically happen at many times that rate...”

more than 40 customers. That means your data packets will be interleaved with other users and that you will only see 512/128kbps in short bursts. Your connection will speed up and slow down depending on how many others are on line with you. This is the same with cable modems and WiFi and some types of VSAT networks.

For the past several years, I have heard over and over again, “I can get a DSL connection to my property for \$19 a month, or so I have heard...” Read the fine print, first it is a residential rather than a commercial connection, so you cannot use it to connect your properties network into the Internet, it can only be used by individual tenants. It is usually an introductory price and the service is probably oversubscribed to get the price that low. That \$19 month DSL connection may not be such a great deal after all, even if you live someplace competitive enough to offer it. Read the contract...all broadband operators have to make these decisions and balance performance with price. Subscriber loading is the major factor in determining the QOS and final price point of any broadband offering, including yours.

As I described, DSL and other like technologies will burst the data to you

in increments that top out at the level you subscribed to. Satellite VSAT has a hidden advantage that even if you have subscribed to a package that tops out at 512/128kbps, for instance, you might see file transfers magically happen at many times that rate, especially late at night. If the bandwidth is available, the hub is usually configured to really let you have it and get your transaction out of the way. It is a beautiful thing and worth staying up late for.

Consumer grade satellite VSAT sys-

tems are notorious for oversubscribing their bandwidth. Not so much the case with commercial VSAT networks and in the case of ODN-Starburst, we can adjust the CIR to your needs and budgets. The VSAT networks support just about everything you can imagine, but the one drawback is that the satellite is a 50,000 mile round trip. At the speed of light, that takes about 200ms or 2/10th of a second. Not noticeable unless you are interactively gaming or placing a VoIP telephone call. In the case of the telephone call, it is a mild irritation, in the case of gaming; my 15 year old teenager will tell you it “*ain't happenin.*” At hotel properties; this is a non-issue, where in a MDU, a hybrid system that uses some terrestrial connectivity for low latency applications (gaming) while the heavy hauling is done with satellite is a better option—especially if a young tenant population is expected.

So keep in mind when getting prepared to tie your tenants to the outside world, a residential DSL or cable modem source will generally not have the CIR or data throughput capacity to provide a trunk to the Internet for your property. You will need a T1, VSAT or commercial DSL/Cable modem product to do that.

When preparing to tie your network

into the Internet cloud, you need to consider the following basics:

In the case of dedicated circuits (T1 or VSAT);

- How long will it take to establish the service, if it is available?
- Is there a fractional service to support me as my network grows?
- Is there any equipment needed at my end (router)?

• Ask about the CIR, QOS and network availability guarantees it is the only real way to get a feel for how the network might perform. Only so much can be done with clever software, then it becomes a raw bandwidth exercise.

In the case of a shared connection (DSL, Wireless, Cable or VSAT);

- Ask about the subscription ratios and are there guaranteed data rates.

• Bursting nature of the connection? Will this burst beyond what you have advertised when the network is idle?

- Can I use this connection commercially?

- Reliability issues?
- Must have a fixed IP address, or multiple IP addresses.

• Contractually, are there fair use issues or data throughput caps? For example, neither a T1 nor a ODN-Starburst VSAT has any data cap. Other network providers do and even some of our other VSAT providers do as well.

- Is there any equipment needed at my end other than modem (router)?

With proper preplanning, these issues are all quite simple to analyze and then implement. Like everything else, it is in knowing the right questions to raise. The use of VSAT is something that has been growing for years without raising much attention. Check on top of the roof of a very large number of chain stores and you will see these products hard at work behind the scenes. Companies like Sears did not install VSAT years ago because they had issues with obtaining telephone lines to support their networks. They did so because they wanted a lower cost, higher quality technology that was repeatable from location to location, no matter where they built a facility. Hotels and now MDU's are starting to follow this

same line of logic. Repeatability without geographic sensitivity, redundancy of communication options both for reliability and emergency uses as well as flexibility are driving the VSAT market forwards.

Almost seven years ago, when I was running Heifner Communications, I was involved in several task forces trying to find reasonable technologies that economically fit our industries need for broadband. At that time, there were no users. Penetrations at properties that had taken the leap to provide broadband were lucky to see anything above 10%. This was obviously problematic both from the economics of this type of technology and the cost of hardware during those early days. Times sure have changed, now hotel chain properties are required to have broadband and the rest are following suit to compete. Apartment complexes are starting to get the entrepreneurial spirit again and building their own systems rather than

deflecting that revenue back to the local cable operator or phone company.

There are now multiple solutions to serve the tenants unit with broadband access and also several options, including VSAT that can tie your network into the Internet. Those options continue to grow and the numbers of broadband customer growth is also on the rise. Many, if not most of these new networks are making money and providing a very visible amenity to the property. It has never been easier to bundle Internet services than it is now and before long a broadband connection will be considered as common as a connection to the water supply. And while we watch the phone companies battle it out with the cable conglomerates over bundled services, the cleverest property owners will take advantage of the best technologies to offer qualities of service that are under their control, not the phone or cable companies.

My friend at the implement store

became a Connexstar™ customer through us and his connectivity problems disappeared. I, on the other hand, am spending my weekends trying to convince deer not to eat my pine trees.

And no, I do not have a pig named Arnold. ■

About the Author

Greg Heifner is one of the early pioneers of satellite communications, he was instrumental in the technology that our industry uses, as well as helping to develop the relationships our industry has with video programmers. He is an "unabashed nerd" and had devoted his life to technology in its various forms. He is now the founder and CEO of Orbital Data Net, Inc., which provides broadband and video solutions to the military, state governments, educators and business' nationwide. He may be reached at 573-445-8101 or greg@orbitaldata.net.

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