

# ***Why Spacenet – The Advantages of VSAT Versus Terrestrial Networking Technology***

*This document contains information proprietary to Spacenet Inc. (Spacenet). It may not be reproduced in whole or in part without the written consent of Spacenet. The disclosure by Spacenet of information contained herein does not constitute any license or authorization to use or disclose the information, ideas, or concepts presented.*

## ***10 reasons why Spacenet provides superior broadband connectivity for IP-based wide-area networks***

### **INTRODUCTION/SUMMARY**

Increasingly, businesses today are moving their network communications infrastructure away from closed-architecture, proprietary protocols, applications and devices to Internet Protocol (IP) platforms that leverage the user-friendly, familiar interface of browser-based applications and the Internet to communicate business-critical information.

The reasons for this paradigm shift are simple: browser-based interfaces are compatible across multiple platforms; they feature unlimited scalability, easy deployment and simplified maintenance; and, they help reduce software development and training costs, since less time is spent on the client/server interface and teaching employees to use it.

For many of these same reasons – enterprise-wide consistency, scalability, ease of deployment and lower costs – a growing number leading companies, when selecting a network technology platform to power their new IP infrastructure, are choosing satellite-based technology from Spacenet over terrestrial solutions. The following paper lays out the 10 primary reasons why Spacenet satellite networks provide a superior broadband connectivity solution for IP, Web-based and other applications.

#### **1. Ubiquitous availability**

Satellite is the only broadband wide-area network technology that is available everywhere – in urban and rural areas of the U.S. and around the world. The satellite fleet that Spacenet uses to power its networks provides coverage on every continent. All that is required for a location to receive connectivity from Spacenet is a clear view of the sky, unobstructed by trees, tall buildings or other objects.

In contrast, terrestrial technologies, such as DSL, Frame Relay, ISDN and cable, are limited in their coverage area. For example, it is currently estimated that DSL service is available to less than 25% of the continental U.S. In fact, even well into the next decade, analysts expect that significant portions of the nation's population will remain out of reach of land-based technology.

*The bottom line – In contrast to frame, DSL and other terrestrial connectivity technologies, Satellite provides broadband connectivity anywhere it is required.*

#### **2. Network reliability**

Whether construction projects dig up the streets, falling trees take down poles, or equipment fails at the local telephone central offices, terrestrial networks have multiple potential points of failure where outages can occur. Moreover, your terrestrial network provider may or may not have the ability to fix these outages without the help of the third-party local and long-distance carriers that own and operate various portions of the network.

A Spacenet satellite network, on the other hand, has just three potential points of failure – the satellite, the hub and the VSAT – each of which has built-in redundancy in case of failure. Satellite outages are exceedingly rare but, should one occur, traffic to failed transponders is automatically rerouted to back-up transponders in a manner that is transparent to the end user and has no impact on service. In the even more remote case of total satellite failure – which has occurred just twice in the 30-plus years satellites have been in commercial use – back-up capacity is available on dozens of satellites. At the hub, online redundant equipment is used to provide immediate switching – again, in a manner completely transparent to the user – for uninterrupted service in the event of equipment failure. Finally, for its VSAT equipment, which has the longest mean-time-between-failure in the industry, Spacenet provides four-hour service restoration to most locations.

*The bottom line – Spacenet satellite networks provide unmatched reliability, with far fewer potential points of failure than terrestrial solutions and built-in redundancy at every level to limit service interruptions when problems do occur.*

### **3. Single, nation-wide service provider**

In a terrestrial environment, there are multiple companies involved in supplying your wide-area network service. Local Exchange Carriers (LECs) own and operate the “last mile,” the portion of the network that connects business locations to the local telephone central office, while a separate set of providers control the “long-haul” portion of the network that spans most of the distance between central offices. In the event of an outage, what often occurs is a revolving vendor “blame game,” where each provider puts responsibility for the failure onto the other, and the customer ends up spending countless hours arguing with various companies, some of whom have no contractual responsibility to restore service in a timely manner.

With satellite, the “long haul” and “last mile” are one and the same – a virtual circuit in space between the hub, satellite and individual VSAT. Not only does this eliminate almost all possibility of failure – since construction crews digging up the street can’t sever a virtual circuit travelling over satellite – but it also means that satellite network customers have a single end-to-end network provider that owns, operates and controls every portion of the network, and can diagnose and fix problems immediately and unilaterally.

*The bottom line – Spacenet provides a single, nationwide point of contact for all network service questions. No matter where a problem occurs, or which portion of the network is affected, Spacenet can diagnose and fix the problem in a timely manner with no involvement from third-party vendors or local telephone providers.*

### **4. Uniform nationwide service levels**

Because Spacenet satellite network service is available everywhere, and because Spacenet serves as a single, nationwide service provider for all components of the network, Spacenet customers are assured of a consistent, uniform level of service at each of their remote locations – the same bandwidth, the same equipment, the same customer service, and the same field support.

With a terrestrial network, on the other hand, service levels will vary according to geographic location. While a certain location close to its local telephone central office may enjoy robust DSL or Frame Relay service and responsive support from its LEC, another location may be out of reach of DSL and forced to use slower dial-up or ISDN service from an unreliable LEC. This, of course, puts certain locations at a disadvantage and adds a level of complexity to network operation and management, as the applications used on the network must be tested for compatibility with a hodge-podge of varying service levels and technologies.

*The bottom line – Spacenet satellite technology provides a single, uniform network infrastructure across your entire enterprise, ensuring that each of your business locations operates with the same technology and receives the same high level of service and support.*

### **5. Timely deployment and installation**

With a terrestrial network, deployment and installation of new locations is a complicated endeavor involving multiple vendors who often have no incentive to work with or assist each other. In many cases, bringing DSL service to a particular location requires coordination between the DSL provider and the LEC (often a direct competitor) to have the proper circuits and equipment put in place. The result is that installation teams from the DSL provider will often arrive at a particular location to commission service,

only to find that the LEC has not done what it was requested to do. The only option for the customer is to reschedule the DSL installers and hope that the LEC will comply with the request in the meantime.

With a Spacenet satellite network, by contrast, installation and deployment are quick and simple. First, because Spacenet technology is completely free of terrestrial infrastructure, there is no need for coordination with the LEC or any other third party. A Spacenet installation team can complete a site install in a matter of hours, no matter where the site is located, meaning that complete network deployment to hundreds of sites can be accomplished in a matter of weeks, rather than months.

*The bottom line – Because deployment of a Spacenet satellite network is completely independent of terrestrial infrastructure, Spacenet networks can be rolled out to hundreds or thousands of locations in a fraction of the time it would take to roll out a comparable terrestrial network.*

## **6. Superior Economics**

Terrestrial networks are comprised of many hundreds of miles of buried cable and building upon building of central office switches and equipment. The overhead costs to support this infrastructure – which also includes maintenance personnel, telephone poles, construction crews and equipment, and management centers across the country – are very high. Digging up streets to lay new cable or find a problem is both time consuming and expensive. And, in the end, these costs are passed through to the customer in their monthly service fee.

The economics of a satellite network, by contrast, are much simpler. The individual VSAT units are relatively inexpensive (about the same cost as a router in a Frame Relay network) and can be quickly and easily swapped out by a field technician. Hub and satellite costs are shared among thousands of customer sites, so the per-site cost of equipment, maintenance and management is low – and gets lower as more sites are added to the network. Finally, unlike terrestrial services, Spacenet can manage all of its networks using a single national Network Management Center for increased efficiency and cost savings. All of this translates to a lower price for the customer, as compared to like services in the terrestrial world.

*The bottom line – Spacenet satellite networks are much less costly to deploy, maintain and operate than Frame Relay and other terrestrial network technologies, and Spacenet passes this cost savings on to its customers.*

## **7. Multicast content distribution capability**

Spacenet satellite networks have a key strength in the distribution of bandwidth-intensive information to large numbers of remote locations. Spacenet's advantage in this area comes from satellite's inherent strengths as a broadcast medium. To send a file to 1,000 recipients over a terrestrial network requires the sending of 1,000 separate and identical messages, each of which consumes valuable bandwidth and server resources. The reason for this is each terrestrial message takes a unique path through the telephone switches and cables that connect to a given recipient. No two messages travel the same path, so they must be sent individually and may arrive at different times.

Satellite IP multicasting, on the other hand, alleviates this inefficiency by multicasting content (at speeds up to 40 Mbps), in a single broadcast message, to a virtually unlimited number of end-user locations. Satellite technology can accomplish this because each user is connected to the satellite through the same "virtual circuit" – space. By eliminating duplicate transmissions, Spacenet's multicast technology maximizes the efficiency of your existing servers and networks, freeing up valuable bandwidth that allows you to do more with your current infrastructure. And, content is delivered to all recipients simultaneously.

*The bottom line – Spacenet satellite technology is the only cost-effective choice for businesses that need to deliver large amounts of data, video or audio to a large number of physically dispersed locations.*

## **8. Site relocation and addition**

One of the challenges of running a large multi-site network is the fact that remote sites tend to relocate over time and, if enough advance notice is not provided, it can be difficult and expensive to accommodate these moves. In a terrestrial world, vendors require at least 45 days notice to accomplish a move. With less lead time, there is a strong chance the vendor will be unwilling or unable to comply with the request, and expedited requests can be very expensive.

Adding a new location to a terrestrial network involves many of these same issues. Plus, adding new sites to a terrestrial network means increased monthly costs for bandwidth, as well as new charges for the local loop and (in the case of Frame Relay) to support the committed information rate to which the customer has subscribed. Additionally, new charges for remote maintenance and network management services for the site may also be added.

With a Spacenet satellite network, by contrast, the time frames required for moves are much more compressed. In fact, de-installation and reinstallation can occur on the same day, in most cases, if the sites are close to one another. In addition, the monthly cost for providing service to a site doesn't change since, from a network perspective, the "virtual circuit" between the site and the satellite continues to serve the new location. When adding new sites, one of the major benefits of Spacenet's satellite technology is that, in most cases, an additional site, or sites, does not translate to additional monthly bandwidth costs.

*The bottom line – Relocating and adding network sites is significantly less complicated and less expensive with a Spacenet satellite network than with most terrestrial technologies.*

## **9. Network capacity expansion**

One of the biggest wide-area network challenges faced by many companies is the ever-expanding need for additional bandwidth to support new applications. In a terrestrial environment this is especially challenging since, if a new application is large enough, new terminal components (routers, cards, etc.) have to be ordered – and increased bandwidth has to be commissioned – separately at each site, in conjunction with local third-party vendors. In many instances, the cost of expanding network capacity on a terrestrial network can exceed the original cost of deploying the network. Plus, such an upgrade, if economically feasible, can take months, since new circuits have to be ordered and every site must be visited by a field technician.

With a Spacenet satellite network, on the other hand, network expansion is extremely easy and comparatively inexpensive. First, all bandwidth allocation is controlled at the hub, so increasing network capacity is as simple as increasing the amount of bandwidth that Spacenet allocates to the network. And, while it is possible that additional equipment may be required at the hub to support the increased capacity, this hardware can most often be installed in a matter of days. More importantly, no hardware changes or field technician visits are required at the remote sites, since Spacenet's VSAT equipment is designed out of the box to handle maximum bandwidth requirements.

*The bottom line – Spacenet satellite technology provides a uniquely convenient environment for accommodating network and bandwidth expansion.*

## **10. Emerging application support**



As a broadcast medium, satellite is a perfect platform for the distribution of bandwidth-intensive content, such as video, software updates, and large data files. Spacenet satellite technology is used today by a number of our customers for distributing broadcast-quality video programming, point-of-sale pricing updates and software files to thousands of remote sites. Multicast capabilities are resident in the VSAT hardware that is used for all Spacenet networks, meaning that the Spacenet network you purchase today can serve as single-platform solution for both your current non-multicast applications, as well as future multicast applications that you anticipate adding.

Terrestrial technology, by contrast, is simply not capable of broadcast distribution, since the resources required to send a broadcast-quality video stream or large software file down each and every “last mile” of cable to reach all recipients are both cost- and bandwidth-prohibitive.

*The bottom line – Spacenet satellite technology is the only choice for companies who foresee video and high-bandwidth content distribution being part of their wide-area network future.*

The above information represents just some of the many reasons that Spacenet satellite technology is the wide-area network platform of choice for many leading businesses. For more information, visit Spacenet at [www.spacenet.com](http://www.spacenet.com).