Delivering the Next Generation of Satellite and Terrestrial Communications
Partnering for the Future

One of the most promising developments in the telecommunications industry has been the integration of terrestrial and satellite networks. This formula has become the answer to organizations that demand ever-present broadband connectivity – covering every application, every geography and every moment in time.

Today, this trend is entering a significant new phase. Organizations want broadband anywhere – but increasingly they want it delivered through a converged IP network that is easy to manage and is cost-efficient.

To meet these deeper demands, terrestrial carriers are building on the successful integration of satellite and terrestrial networks to make satellite connectivity a critical dimension of their next-generation networks.

I begin my leadership of iDirect at this exciting time. It’s a time of new opportunities, but also a fresh set of technology challenges.

For one, next-generation networks are more dynamic. Voice, data and video – and countless customers – must efficiently share the same precious bandwidth. Future networks must also meet heightened security requirements, yet afford customers increased access to their private networks.

iDirect has embraced these challenges. We’re helping the world’s terrestrial carriers satisfy accelerating customer demands by shaping our technology to meet the same set of customer needs.

This supplement to Via Satellite Magazine presents an overview of how we’re accomplishing this and provides a real-world look at how future networks deliver business results.

There’s certainly a new horizon to aim for, and I and the entire iDirect team are eager to help all our partners reach it.

Sincerely,

Mary Cotton — Chief Executive Officer, iDirect
Broadband has become as vital to life as the air we breathe. Call it the fifth element. No business or organization can thrive today without a high-speed connection to the information and applications that drive its operations.

The need is universal. From a geographical perspective, organizations want the same level of bandwidth that hums through headquarters to fuel remote offices in developing nations. And they want a canopy of coverage that stretches across land and sea and reaches into the sky, making broadband available anywhere it may ever be required.

Organizations also want an integrated network – one that converges voice, data and video and supports all of their business applications. They want to adjust the rules that prioritize traffic on that network. Voice quality, for example, must never be jeopardized by the flows of CRM and ERP data that continually cross the same channel. If organizations want to change these rules, they must be able to do so at any time, with minimal effort. And of course, every communication must meet critical security requirements.

“We’ve reached a point where organizations want a single network that supports all of their applications and reaches every one of their locations. And they want this delivered by a single provider under a global service level agreement,” explains David Bettinger, iDirect’s chief technology officer.

Several of the world’s terrestrial carriers have responded ambitiously to these demands. They have developed next-generation IP networks that integrate terrestrial, wireless and satellite technologies – designed to meet any high-speed need from voice to data to video. These networks also enable carriers to improve their own businesses, merging disparate networks onto a single, efficient platform.

Next-generation MPLS networks

Much of this progress is delivered to carriers’ customers through Multi Protocol Label Switching (MPLS) networks. These networks allow carriers to emulate a circuit switched connection across an IP packet network, providing advanced traffic engineering and enabling separation of data packets.

Satellite and MPLS terrestrial networks can be integrated at enterprise sites to protect business continuity. Satellite bandwidth will not falter when terrestrial lines fail, and it preserves broadband speeds unlike common ISDN rates for terrestrial back-up networks. This satellite bandwidth can also be used to broadcast video and other multimedia content, preserving space on terrestrial networks.

To accomplish seamless integration, both satellite and terrestrial paths must be able to handle BGP routing. MPLS labels must map to VLAN tags on the satellite network to preserve data privacy. SLA specifications on the terrestrial network must be mirrored by satellite QoS settings. In addition, a satellite Network Management System (NMS) must sync with a carrier’s Operational Support Systems (OSS).
to ensure the security of customer information. Further, carriers can engineer MPLS networks to support very complex service level agreements, guaranteeing bandwidth levels and Quality of Service settings even down to the application level. And they can enable customers to make configuration changes.

MPLS networks are helping carriers meet many emerging customer demands. But, if they are purely terrestrial systems, they retain inherent limitations in reach, immediacy and functionality. It’s no surprise that parallel with their investments in next-generation networks, terrestrial carriers are boosting their satellite capabilities.

“Once considered rivals, terrestrial and satellite networks can work hand-in-hand as a single, seamless IP network with immediate global reach,” states Max Engel, a strategic analyst with Frost & Sullivan’s Broadband & Satellite Industry Information & Communication Technologies group.

**Seamless integration**

Satellite communications has changed dramatically in recent years – shifting from its traditional role to a packet-based, two-way IP system designed to integrate seamlessly with terrestrial networks.

“At iDirect, our technology is driven by the same core demands that terrestrial carriers are facing,” states Bettinger. “We’ve engineered into our platform Quality of Service features that mirror the complexities of terrestrial service level agreements – matching the bandwidth rates and traffic rules that enable shared networks to prioritize converged data. Additionally, the iDirect Intelligent Platform supports advanced IP routing protocols such as BGP and VLAN Tags that enable it to seamlessly integrate into MPLS networks.”

“VSAT platforms like iDirect’s that are designed and built from the ground up around IP are playing a key role in how terrestrial carriers meet customer demands,” adds Engel.

The integration of terrestrial and satellite technologies enables carriers to expand their services and tap new business opportunities. These include a deeper dimension to their business continuity capabilities, allowing them to keep businesses running at high speed when primary networks fail. They comprise more efficient ways to deliver multimedia content across multiple destinations. And they include rapidly advancing services that enable mobile connectivity from portable communications command centers to broadband aboard planes, sea vessels and land vehicles.

**Future technology requirements**

According to Bettinger, the accelerating deployment of MPLS-based networks will force satellite equipment manufacturers to continue emulating the technology features of an IP terrestrial network. The blueprint for the immediate future includes support for BGP protocols, advanced traffic engineering, VLAN tagging, data security, further integration with carriers’ Operational Support Systems and IPv6.

“From a customer perspective, we’re quickly losing the distinction between terrestrial and satellite communications. It’s simply IP anywhere. And as carriers keep innovating to meet emerging demands, the satellite industry plans to stay in lock step.”

---

**Profile: Verizon Business**

While satellite services may not be as new-fangled as other types of data transmission services, Verizon Business is finding some surprising new ways to use satellite services for its wide range of enterprise and government customers. Satellite’s traditional role has been to deliver primary service to geographic areas where terrestrial communications don’t – or can’t – exist. However, Verizon Business has found a way to meet heightened customer demand using satellite – even where terrestrial connectivity exists.

The carrier is creatively applying the advantage of satellite to broaden the capabilities of its MPLS-based Private IP (PIP) network, which the company rolled out in 2000. Since then, the global network has grown to span more than 120 countries, 5,000-plus business customers and 150,000 customer ports.

Verizon Business is using satellite services to “extend” its PIP network, assuring business continuity, delivering an efficient method for multimedia distribution and VoIP traffic and providing connectivity under just about any circumstance.

**Reliable business continuity**

“Traditional terrestrial backup services, like an ISDN BRI, can’t meet the bandwidth requirements for many of our business customers;” explains Mark Mulholland, a sales engineering manager with Verizon Business’s specialized services group.

Mulholland also notes a typical terrestrial backup link usually shares some of the same infrastructure as the primary network and should the primary network fail, the backup network also can fail. “Satellite communications solves both these problems – it does not share local infrastructure and it has high bandwidth availability,” says Mulholland.

Customers who use satellite as a back-up strategy say the rerouting of their traffic is so transparent they are typically unaware when the switch is made from their terrestrial network to VSAT.

“A satellite terminal is really just another access point to the MPLS network,” explains Stuart Burson, Verizon Business’s senior manager for engineering and implementation. “It’s designed to be as transparent as possible for the customer.”

Creating a seamless customer experience requires a tight integration between terrestrial and satellite systems. For this reason, Verizon Business has built its satellite capability for this product relying primarily on the iDirect platform. iDirect enables Verizon Business to offer service level agreements on its satellite network comparable to those
it extends on its terrestrial MPLS network. In addition, the iDirect platform supports full VLAN separation, ensures two-way data encryption and enables Verizon Business to manage system features easily.

In the past two years, Verizon Business has seen a sizable jump in business continuity services using the combination of satellite and MPLS. Early in 2007, the carrier implemented a Private IP satellite network for a major U.S. retailer. Verizon Business replaced a single-channel 64K ISDN BRI system with a 1 Meg satellite network and, in just 85 business days, more than 2,200 locations had connectivity. Proof the customer was happy with Verizon Business’s approach came with the customer’s invitation for Verizon Business to bid on the back-up service for another portion of the customer’s business.

**Multipurpose networks**

“Even though we’ve made this very affordable, businesses want more use out of their backup network,” says Mulholland, “and we’ve found a way to accommodate them.”

“What we’ve done with a number of customers is integrate a hybrid network to use the satellite system for business continuity, then the customer can use that same bandwidth to stream multimedia for video, corporate TV, digital signage and other uses, such as PC software refresh.”

For that large retail customer, Verizon Business merged back-up bandwidth and MPEG-4 video content onto the same platform, doubling the video bandwidth capacity compared to a terrestrial T1 line.

“Our customer now has extra bandwidth for day-to-day mission-critical operations and a backup network when needed,” says Mulholland.

“A satellite terminal is really just another access point to the MPLS network. It’s designed to be as transparent as possible for the customer.”

- Stuart Burson, Verizon Business

Verizon Business also is using satellite connectivity to meet customer needs during periods when the terrestrial network is not available. “We’ve had customers use satellite as an interim method to provide connectivity at a business location until their terrestrial network is up. Then the satellite hardware remains in place to provide business continuity,” said Mulholland.

Finding creative ways to serve its customers, Verizon Business is taking its satellite services to new heights.
BT has an ambitious goal for its customers: 100% global IP coverage. And the communications giant has an equally impressive plan to deliver this promise: the company’s 21st Century Network (21CN).

BT’s 21CN is an $18 billion, seven-year effort launched in 2004 to replace 16 separate legacy networks, including its circuit-switched public telephone network, with a complete end-to-end IP network. While the 21CN is built out toward a 2011 completion date, BT has already invested heavily in an MPLS IP network, which is currently deployed in 170 countries.

A critical feature of BT’s MPLS network is a next-generation service called BT Internet Anywhere. The network combines terrestrial and satellite IP technologies, enabling BT to meet accelerating demands for high-speed remote connectivity, business continuity and other customer needs.

“We’re extending BT’s world-class terrestrial coverage with world-class satellite coverage,” explains Harry Formosa, general manager, client management for Europe, Middle East and Africa.

Bringing broadband to Barclays Africa

Through satellite connectivity, BT customers like Barclays are expanding their IP networks to remote locations and mobile terminals. The bank’s Africa division – Barclays Africa – needed a better infrastructure to deliver its banking services. Its existing network was deficient across several critical requirements including bandwidth speed, voice and data integration, and the ability to scale.

Turning to BT, Barclays Africa connected more than 120 regional sites across the continent to a centralized IP data network. The result was an enterprise-class converged network that enables two-way data transmission from ATMs and point of sale terminals and routes other transaction traffic to the bank’s data processing center in Gloucester by way of BT’s Cornwall earth station.

With the network in place, capacity problems have been eliminated. Bandwidth can be allocated dynamically and there is much lower latency, with a signal round trip delay of less than 700 milliseconds. As a result, the broadband network also enabled Barclays Africa to improve Internet and telephone banking and to handle customer queries more quickly.

The network is saving Barclays Africa considerable business costs. It’s lowered operating and back office expenditures and is expected to significantly minimize distance learning and training budgets.

A transparent network

The integrated IP network was developed by BT on the iDirect platform.

“The iDirect platform has been specifically designed to optimize IP traffic delivery over satellite,” affirms Formosa.

Formosa singles out iDirect’s Quality of Service feature which matches the service levels on its MPLS network necessary to separate different types of data, giving priority to time-sensitive voice packets or traffic from mission-critical applications. Formosa adds that iDirect’s support of end-to-end data encryption also enables BT to meet its customers’ demanding security requirements across both terrestrial and satellite links.

“A VSAT technology provider must understand the complexities of various IP applications to make sure they can operate on satellite exactly how they operate on terrestrial.”

- Harry Formosa, BT
Orange Business Services provides IP-based telecom services in more than 200 countries and territories. Demand has surged for the company’s IP services as customers increasingly adopt enterprise IP applications and seek to integrate users on a common network from headquarters to the remotest of locations.

“Oracle, Citrix and SAP applications are being rolled out on a global basis, and our customers want peace of mind that their IT solutions will work across all geographies and perform well,” explains Ferdinando Loiacono, business development director for international markets.

This trend has driven demand for the company’s satellite IP services, which are an extension of its terrestrial MPLS IPVPN network. Loiacono adds, “Orange Business Services provides end-to-end solutions regardless of transport technology. We need to support clients with a quality solution even in countries where the terrestrial infrastructure is unavailable, unreliable or cost prohibitive.”

One customer using Orange Business Services’ integrated MPLS and satellite network is a global petroleum company. This company is deploying IT applications on a worldwide basis to maximize the efficiency of its operations and to run all its global offices on a centralized model.

Many of the company’s Africa and Middle East applications were cut off from the company’s main network. Thanks to Orange Business Services’ Satellite Access to VPN service, 38 remote offices across eleven countries in this expansive region are now connected to a central MPLS network.

Employees in Africa and Middle East offices – across sales and marketing, operations and other divisions – can now leverage the same corporate tools available to the company’s employees worldwide.

Orange Business Services also provides integrated VPN network services to a major global bank in Africa, connecting more than 25 remote offices. The network supports financial software applications and VoIP service.

“We are managing their network in Africa in a very resilient and reliable configuration, allowing the bank to run its financial operations in Africa with world-class network performance,” Loiacono explains. “For VoIP, this is especially important as the bank requires a high quality voice connection to conduct business successfully.”

“Cisco approach”

According to Loiacono, “The success behind our Satellite Access to VPN service is that it was developed with an IP mindset. From the very beginning, we intended to blend it with our MPLS network. We really took a ‘Cisco approach’ to VSAT. We spelled out what services were needed by the client and developed them so they would complement our terrestrial offerings.”

The key technology requirement that guides Orange Business Services’ selection of a satellite communications platform is the ability to support a seamless class of service from a remote site over to a satellite link a VPN on its MPLS network.

“We selected iDirect as our leading platform for delivering MPLS, IP and VPN,” Loiacono states. iDirect’s Quality of Service features enable Orange Business Services to match service levels on its MPLS network. All five of the company’s classes of service that govern data, voice and video applications are supported on the iDirect platform.

Orange Business Services operates 16 iDirect hubs from eight different teleport sites. Its average network client has between 30 to 40 remote sites under one satellite footprint.

“Direct allows us to offer high-grade Quality of Service, but allows us to do this cost effectively by deferring investments in hub technology until demand is sizable. We can meet our customer requirements in a very scalable way.”

“iDirect technology is IT-friendly, allowing us to transfer satellite competence to our customers and global field technicians.”

- Ferdinando Loiacono, Orange

Ease of management

Loiacono adds that as satellite communications grows, it cannot be cumbersome for the company’s technicians and customers to manage.

“iDirect technology is IT-friendly, allowing us to transfer satellite competence to our customers and global field technicians.”

For Orange Business Services, its satellite offering is growing at a very rapid rate. The company is seeing strong demand across government, maritime, energy, construction and other markets.

Loiacono sees a “very bright future” as Orange Business Services expands its MPLS network to meet even the most demanding customer needs.
Advancing a Connected World

iDirect® is transforming the way the world gets and stays connected. The company’s satellite-based IP communications technology enables constant connectivity for voice, video and data applications in diverse and challenging environments. These include extending private networks to remote offices; supporting mobile connectivity across land, sea and air; providing rural telephony and Internet broadband; and maintaining communications in the wake of disasters and network failures. The iDirect Intelligent Platform™ integrates advanced technology into iDirect’s portfolio of hubs, routers and network management software to address the growing complexity of deploying and managing global IP networks. With more than 13 years of global satellite communications experience, iDirect serves customers in 30 countries through a diverse network of channel partners, including some of the largest satellite providers, operators and carriers in the world and seven of the World Teleport Association’s Global Top Ten. Headquartered in Herndon, Virginia, iDirect has offices in Europe, Asia, Middle East, Africa and Latin America. iDirect is a subsidiary of VT Systems Inc.