

Via Satellite's

Tech Focus REPORT

Achieving Greater Returns



Any application. Any environment. Always available. These are the customer requirements placed on satellite service providers as they struggle to manage capacity and adjust to increasingly dynamic and complex networks. New innovations from iDirect will lead the way forward, delivering greater efficiencies and new levels of flexibility. The payoff: Service providers can strengthen network performance and maximize profit.



IP satellite communications is completing its transformation from a niche technology to a feature-rich, mainstream connectivity solution. That's bringing both opportunity and risk to the industry. The more organizations rely on satellite communications to run critical applications, the more they expect from their service providers.

"End users see the great possibilities for satellite communications, and they are putting the technology to work in many new ways," says David Bettinger, iDirect's chief technology officer. "The question now becomes: how do service providers support more complex and diverse network environments and at the same time become more profitable?"

"The answer lies in how well you design a satellite network to handle dynamic environments, bandwidth-intensive applications and growing volumes of data," Bettinger adds.

Too often, satellite networks are simply not flexible enough to address these issues effectively. For example, in order to guarantee quality links that hold up in the most adverse weather conditions and under heavy data loads, networks are usually configured at fixed levels set for worst-case scenarios.

This approach can waste bandwidth and creates an expense that service providers cannot sustain if they want to grow their operations. The alternative, which can be just as costly, involves replacing satellite technology as a network changes over time.

These innovations will provide the features service providers require to adapt their networks efficiently to changing traffic, applications, weather and other conditions that present daily operating challenges, as well as new opportunities to differentiate their services.

Adaptive TDMA

One of these major developments will be iDirect's implementation of Adaptive TDMA on the inbound channel. Adaptive TDMA delivers benefits similar to those provided by ACM on the DVB-S2 outbound channel.

With this feature, service providers can design remotes in the network in the most favorable way based on efficiency, speed and availability. This technology allows any number of carrier sizes to be pre-defined in order for each remote to use the most optimal carrier, depending on the remote's location within the satellite footprint and the current weather conditions.

For example, remotes under optimal clear sky conditions, close to the beam center or with more powerful RF equipment can take advantage of the highest, most efficient carrier (symbol) rate to maximize data throughput. Should the condition degrade because of changing weather, such as rain fade, the iDirect system can automatically switch to a more conservative carrier size within the network to maintain availability and

New Additions to the Evolution Lineup

The **Evolution X5 Satellite Router** features iDirect's highly efficient implementation of the DVB-S2 standard with Adaptive Coding and Modulation and delivers twice the memory and processing power as the Evolution X3. The Evolution X5 offers the choice between iNFINITI mode and Evolution DVB-S2 mode. The router also supports extremely efficient FECs with 2D 16-State coding and advanced technologies such as Global NMS, Automatic Beam Switching and Direct Sequence Spread Spectrum.

iDirect's new **XLC-M and XLC-11** Line Cards support multi-channel demodulation as well as all the advanced features of the Evolution X5 router.

Future iDX software upgrades will allow for Adaptive TDMA, multi-channel support and SCPC Return Switching capabilities.



carriers with extra built-in rain fade margin previously made such offerings cost-prohibitive.

2D 16-State Inbound Coding

One of the core technologies supporting Adaptive TDMA will be iDirect's implementation of 2D 16-State, a next-generation coding technology. 2D 16-State is the most efficient inbound coding on the market today. It is more powerful than existing Turbo Product Codes and more granular than LDPC, which is the standard coding mechanism for DVB-S2 on the outbound channel. 2D 16-State is optimized for smaller inbound traffic by offering a service provider more block sizes and Forward Error Correction (FEC) choices.

Greater choices mean increased flexibility and efficiency in network design leading up to 1.5 dB, or 50%, efficiency improvements in the link budget. When combined with Adaptive TDMA, it provides extremely strong bandwidth efficiencies and return on investment for service providers.

"Our introduction of 2D 16-State inbound coding is a critical industry first and will provide iDirect partners with a cost-effective technology to handle increasing data volume," says Burdick.

performance. The iDirect system will monitor conditions and dynamically switch between channels as necessary.

"This gain in flexibility will enable service providers to efficiently support different bandwidth allocation models and deliver more consistent performance and reliability to end-users," says Chris Burdick, iDirect's vice president of product management.

"This will result in higher network uptime, as well as enable dynamic reconfiguration of carriers and faster acquisition of remotes into the network," Burdick adds.

Adaptive TDMA also allows service providers to expand their service offerings to the beam edge where more expensive RF equipment or

"In addition, improved flexibility with block sizes makes it easier for iDirect partners to launch differentiated voice and data services."

SCPC Return Switching

While satellite networks must hold up under adverse weather conditions, they also need to bear the weight of bandwidth-heavy applications, such as real-time business tools and rich media content, while using satellite capacity as efficiently as possible.

"Ultimately, we give service providers the flexibility to design their networks to meet ever changing customer demands and deliver a highly reliable service."

To address this, iDirect is developing a new feature: the ability to switch individual routers dynamically between TDMA and SCPC modes on the inbound channel without the need for costly on-site visits or hardware additions. This feature is extremely valuable for organizations that want the cost effectiveness of shared capacity with the ability to dynamically activate SCPC return channels if data rates are large enough to justify dedicated bandwidth.

For example, on an oil rig, an iDirect router can be set on TDMA mode for 23 hours of the day, accommodating voice calls and

Internet traffic. But for that one hour when there is a heavy volume of data to transmit, the router can switch to an SCPC-dedicated return channel. With iDirect's SCPC Return Switching feature, service providers can avoid over-dimensioning networks to account for peak activity or to accommodate future traffic growth.

Another sector that will see benefits from this technology innovation is mobile cellular backhaul and other trunking businesses.

Initially, remote mobile sites may have limited traffic. Typically, TDMA networks enable mobile operators to serve multiple rural sites more efficiently than SCPC links. With TDMA, an operator can design the network based on current usage patterns. If after a few years the usage on some sites grows to such an extent that a dedicated service is required, the router can be switched to SCPC mode.

Service providers can even provide a way for their customers to schedule these switches through a Web portal. Automatic scheduling can be achieved by integrating software applications such as ScheduALL

with iDirect's iVantage Network Management System through the use of iDirect's iToolkit, a suite of programmable XML interfaces that integrate external OSS/BSS systems.

"Ultimately, we give service providers the flexibility to design their networks to meet ever changing customer demands and deliver a highly reliable service," says Burdick. "They're not locked into a pattern of unnecessary costs that continually challenge their business profitability."

Innovation for Growth

As service providers seek ways to run their business more profitably and support an increasingly diverse and demanding set of network scenarios and end-user applications, iDirect's offerings will continue to provide a critical benefit – improved bandwidth efficiency in the most cost-effective manner.

iDirect delivers all this through a single platform that can run multiple networks regardless of size or topology. This integrated approach enables iDirect partners to provide a reliable end-user experience for every application in every environment.

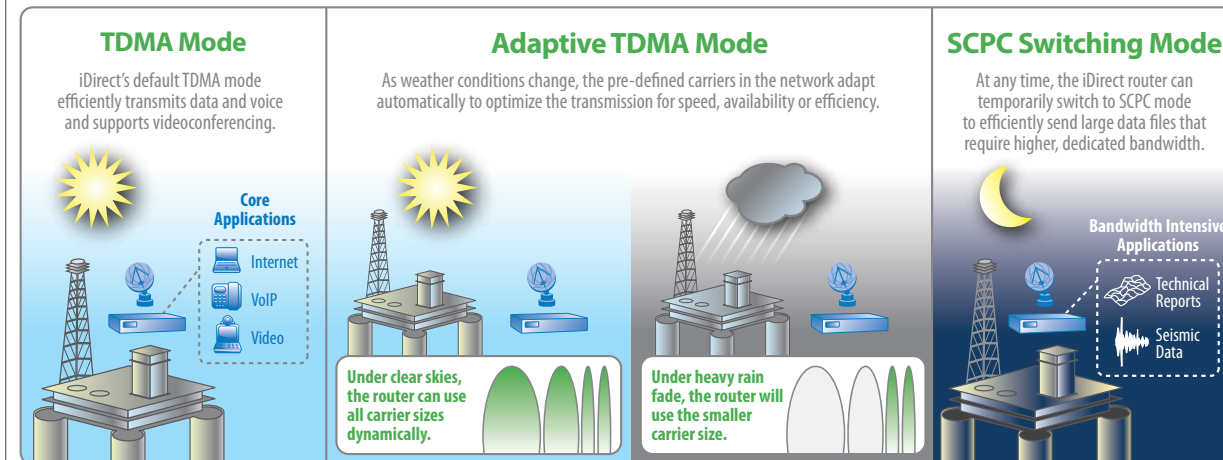
"These technology advancements will be a revolutionary step forward for our partners and the VSAT industry," says Bettinger. "Our approach is based on a commitment to flexibility, efficiency and performance, designed to meet ever evolving customer requirements, while protecting and enriching our partners' investment in iDirect technology."

"iDirect has worked tirelessly to develop the industry's most reliable technology, while putting equal effort into making our platform as efficient and flexible as possible."

"We understood the technology advantage our partners would need when satellite IP communications fulfilled its promise to be a central and highly functional networking strategy," says Bettinger. "iDirect has worked tirelessly to develop the industry's most reliable technology, while putting equal effort into making our platform as efficient and flexible as possible."

iDirect accomplished a major achievement on this front one year ago with the introduction of its Evolution product line based on DVB-S2 with Adaptive Coding and Modulation (ACM). iDirect is now developing several new technology innovations that will address increasingly dynamic end-user networks and advance bandwidth efficiency to higher levels.

Greater Efficiencies and Flexibility on the Inbound Channel



iDirect's inroute technology will offer **Adaptive TDMA** and **SCPC Return Switching** functionality. This provides greater flexibility for service providers to maintain optimal bandwidth efficiency, adjusting to any weather condition or bandwidth requirement.



One Platform. Countless Possibilities.

Your clients have business needs that take them in different directions. Global networks. Mobile communications. Business continuity. Remote connectivity. You need a solution that meets those needs, no matter where they lead. That's why we've developed **The iDirect Intelligent Platform™**. It's a single integrated satellite communications system with the flexibility to take your clients anywhere. It's developed according to one universal set of requirements to support any location, bandwidth, application, satellite or topology. The platform allows for seamless integration with terrestrial networks. It simplifies network management. It provides satellite bandwidth efficiencies. It's your passport to opportunity.

Visit www.idirect.net or call 1.888.362.5475 to find out more.

Advancing a Connected World

