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By Philip Hunter

The satellite industry is expanding into new markets - including maritime and M2M - to counter the growing threat on the ground, discovers Philip Hunter

The satellite industry faces a growing threat to its core FSS (fixed satellite service) business in telecommuni-cations and video transmission from proliferating fibre networks, particularly in the developed nations. As a result satellite operators such as SES, Intelsat and Eutelsat are looking to increase their coverage of new geographical areas, and also exploit emerging application sectors involving mobility, particularly maritime, military, commercial aviation, and machine-to-machine (M2M). In these sectors access to fibre or other wired is not usually available, with terrestrial wireless

coverage also patchy or non-existent, leaving just satellite networks able to provide the required universal coverage without any "not spots".

Currently about 70% of the FSS market for satellite operators lies either in video distribution for TV services, or video cont-ribution, for example from outside broadcasts. This is under threat in the devel-oped countries of North America, Europe and the Far East, according to Maxime Baudry, co-head of satellite practice at French media analysis firm IDATE.

"We expect demand to be stable, and possibly decline, in developed areas such as North America or Western Europe over the coming years, because of increasing competition from terrestrial networks, mainly IPTV which is really booming over these zones, as well as the migration of content to the internet with OTT video," says Baudry.

On top of that, cheap plentiful bandwidth over expanding IP-based fibre transport networks is pinching high bit rate video contribution traffic from satellites in these countries. Deployment of global content distribution networks (CDNs) will also enable distributed video to bypass satellites as it is pushed closer to the points of consumption.

Fortunately for satellite operators widespread fibre deployment will be confined mostly to developed countries in the midterm, leaving huge growth opportunities in emerging markets. "Satellite operators like SES, Eutelsat, or Intelsat have increased their presence there by opening new orbital positions or even by acquiring some small satellite operators," says Baudry.

But in the longer term satellite can only assure its future by trading on its unique coverage and broadcast potential, with the ability to reach moving or remote terminals in areas that can never be connected to a terrestrial network of any kind. These markets will not for some time account for a large proportion of satellite traffic but will punch above their weight because they are hugely profitable and generate high ARPU.

Seeking ARPU with M2M

The burgeoning M2M market is a case in point. This embraces a welter of applications, including monitoring of ocean buoys to gather data about weather or sea water, tracking sensitive containers, and remotely managing solar or wind power plants. There is strong competition over land from cellular networks which can be more competitive there, but satellite M2M generates on average over twice as much ARPU. Partly because of this M2M will become a substantial market for satellite operators, growing five-fold worldwide over the next four years from EUR500 million worth at the end of 2010 to EUR2.5 billion by end of 2014 according to IDATE.

There is another reason M2M will become more important for the satellite industry - the growing number of IP devices transmitting data continuously in real time. This will make the market more viable for the major satellite operators that so far do not play in the M2M market because it mostly involves low bandwidth intermittent transactions with small data packets. These markets are served by specialist players, notably Orbcomm, Iridium and Global Star, which each cover the main regions with satellite constellations dedicated to asset tracking, M2M and other applications that at present are low bandwidth.

"But as M2M becomes more IP based and consumes higher bandwidth, we will see FSS starting to address that," says Jay Yass, VP for network services at FSS satellite company Intelsat. Yass cited a recent Italian deployment by satellite and terrestrial broadband service provider Hughes Network Systems for monitoring different points of various power substations, enabling more proactive detection of faults, reducing incidence of power outrages or enabling them to be fixed more quickly. The idea is to poll monitoring points continuously rather than intermittently, consuming more aggregate bandwidth and requiring higher quality of service.

At the same time, M2M will expand into new application areas, according to Simon Watts, chief engineer at Hughes Europe, owner of Hughes Network Systems. "These include the automotive sector and other aspects of the smarter home," he says, pointing out that the ability of satellite services to cover all locations for a particular application was crucial.

Another emerging area is real time imaging between remote sites for critical applications where direct wired links are not always available and satellites can provide more reliable communications than alternatives such as cellular. "This is already starting to happen, with Hughes equipment supporting imaging and data access for telemedicine initiatives underway in Germany and Africa," notes Watts.

But satellite still faces some challenges in order to exploit its full mobility potential in a future world populated by large numbers of IP devices. One of the challenges lies in participating fully in the IP infrastructure that connects these mobile devices together, and become in effect a routing hub alongside wired and wireless terrestrial links. An important step on this front is the ability of individual satellites to segment their footprint into zones covered by different spot beams, and multi-beam technology has already been used to deliver regional or local TV programming over areas typically up to 300 miles in diameter. Larger satellites will be able to support potentially up to 40 spot beams, increasing aggregate data capacity with correspondingly much lower bandwidth cost.

Cisco spotted this trend coming and has developed a space hardened router, branded IRIS (Internet Routing In Space), with one already deployed in the Intelsat 4 satellite launched late 2009. So far this has been evaluated just by the US government for military applications, but will in future be deployed for general mobility services.

"This is experimental at the moment, but will bring FSS operators closer to the overall telecommunications market, as we can show satellite is just another node in the network," says Bruno Fromont, Intelsat's VP of corporate strategy.

With a router on board, a satellite can address IP devices directly, avoiding the need to bounce IP packets back to ground after receiving them in order for routing to be performed. By extracting IP routing information directly and acting on it, a satellite can remove the need for this double hop, which can add half a second to the round trip delay. The result is that satellites will become viable for some real time applications, perhaps video conferencing, where currently the delay is too great.

Expanding maritime sector

The ability to route directly will also help satellite communications continue to expand in two markets where they already have a largely captive customer base, in marine and increasingly commercial aviation. The marine sector may seem mature but it is only over the last few years that increased broadband and interactive capability have enabled satellites to provide more compelling services both to travellers and staff on board ships, increasing ARPU for operators as a result.

Growth in the marine sector has been driven not just by passenger ships and luxury yachts, but also merchant vessels, where broadband services have become important for recruitment and staff morale, according to Ian Canning, VP of global product marketing at mobile IP communications specialist Stratos Global, one of the largest suppliers of satellite services to the maritime sector.

"Recruitment and retention of well-trained sea-farers is one of the most important drivers for the increasing use of mobile broadband satellite services such as Inmarsat FleetBroadband," says Canning.

"One of the most effective ways to improve shipboard life for seafarers is to provide dedicated voice, email and GSM communications systems that are powerful, economical, easy to use, and available away from the bridge. To meet the rapidly expanding requirements for expanded crew communications, Stratos recently added true onboard internet café features to its popular AmosConnect Crew CommCenter application."

The much lower cost per bit enabled by the emerging crop of multi-beam satellites will play well in the marine sector, according to Doron Elinav, VP of marketing and business development at Israeli satellite product and service company Gilat Satellite Networks.

"The new multi-spot beam satellites bring the benefit of much lower cost per bit, and at the same time provide higher power transmission when compared to traditional Ku Band satellites," notes Elinav. "This opens a potential to new applications currently not possible - for example broadband Internet access while using very small (and flat) Ka Band antennas."

Ku and Ka band are portions of the microwave spectrum used for satellite communications. Ka Band is higher frequency and was introduced to satellites more recently, with narrower beams allowing more reuse of frequencies and higher power, but requiring greater precision in the manufacture of antennae and more sophisticated electronics to cope with attenuation, especially in heavy rain.

"Flat antennas will play an important role, enabling deployment on vehicles, where a large antenna would not be practical," says Elinav, adding that this will also enable development of lower cost maritime satellite systems that could be affordable for example by fishing vessels and small personal yachts.

Commercial aviation will also be a small but fast growing and profitable niche over the next few years as airlines compete by offering full broadband services on board. In fact, WiFi access to internet on board some planes has been possible since 2005 when Boeing announced its Connexion by Boeing service, but roll out has been slow, partly because of the logistical issues both of billing for the service, and of upgrading aircraft. However it will be much more widely deployed over the next few years, believes Intelsat's Yass.

Opportunities ahoy

As these new services emerge one question will be whether Europe will retain its surprisingly dominant position in the satellite field, both in terms of manufacturing and coverage. European firms account for around 40% of satellite hardware according to various estimates, and the continent is a global hub for the communications.

This will continue and be reflected in future satellite launches, according to Gil Ilany, VP of marketing for Israeli based satellite operator Spacecom. "Europe will continue to be a hub for communications between the Middle East and North America," argues Ilany.

"We are continuing development of the AMOS-6 for launch in 2014 to take a position over Europe with pan European coverage and of the Middle East. We can look at the continent to continue its major role in communications around the world as the polyglot of nationalities and businesses requiring global communi-cations services in Europe will continue to grow."

So while satellite operators may lose market share in their core video transmission markets, there are plenty of opportunities to play a big role as hubs or nodes of the future global IP infrastruc-ture, while continuing to be highly profit-able in mobility niches that cannot be reached by terrestrial means.

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