



# The Public and Private Face of Satellite-Based Solutions

**Serving the many facets** of our need to communicate, across all our public- and private-sector activities, satellite communications have grown to a mature technology and the applications they serve have more than come-of-age. There is now a clear realisation that communication via satellite is an extremely cost-effective solution to the connectivity needs of all spheres of human activity – in governance, in commerce and industry, in education, in health, and in the plain and simple need to “talk”. This has resulted in a huge demand for satellite-based solutions in both the public and private sectors.

The widespread deployment of satellite networks around the world in the last 20-25 years, based on ever advancing technology, as well as on the increasing sophistication of satellite-terrestrial hybrid solutions, has resulted in economies of scale that make the total cost of service more attractive than ever before.

This realisation has grown with the advent and exponential growth of both the supply and demand for broadband connectivity. The unmatched cost-effectiveness of broadband over satellite arises from the unique combination of its broadcast capabilities within full networking solutions without limitation of distance, geography or location. Internet Protocol over DVB (IP/DVB) is the de facto standard for broadband communications over satellite, and such systems most clearly demonstrate the nature of their great cost-effectiveness by matching the asymmetric nature of Internet traffic. Satellite services can provide 35-35 Mbps for backbone connection, with significantly greater data rates available for key business applications, e.g. videoconferencing. Multicasting speeds reach 2-10 Mbps and delivery of Internet to consumers can be achieved at DSL speed or greater.

Satellite access solutions can be deployed rapidly and economically with uniform quality of service at all user locations. High-speed and secure delivery of all types of broadband applications is achieved through a single, end-to-end solution that is more reliable than terrestrial alternatives, flexible to fit with present demand, and scalable to fit all future requirements.

International telecommunication services have facilitated the creation of a global economy, where satellite-based systems are used extensively in the developed nations to reduce costs. Increasingly, developing countries are also turning to satellite-based solutions, which, being distance independent, make it possible to link the providers of raw materials to agents, to shippers, to importers, to retailers and finally, to consumers in widely-separated geographic areas.

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Indeed, in both the developed and developing regions of the world, the benefits of satellite-based communications are being realised in every sector of activity, both private and public. From Internet Service Providers (ISPs), banks, and stock exchanges to schools, hospitals and rural telecentres, satellite services are being seized upon to elevate economic, educational, and health standards. In turn, higher economic and social standards are attracting foreign investment, creating employment opportunities, leading to increased exports, and yielding stronger hard-currency earnings.

Demand for these solutions arises from two primary user categories. The first is the corporate and government user, which includes banks, retail companies, oil interests, ISPs, and many other types of small, medium and large public and private enterprises. The second are individual consumers, entrepreneurs, farmers and traders.

Enterprises that have connectivity requirements in areas where terrestrial technologies cannot provide affordable services are prime candidates for the use of VSAT technologies. However, traditionally the largest use of satellites has been in *developed* countries with good terrestrial infrastructure. Enterprises have still found that satellite-based networks provide a more cost-effective point-to-multi-point solution than fibre-optic cables, which are optimised for point-to-point applications.

## Use of Satellite Applications in the Private Sector

The most prestigious ‘Blue Chips’ of the global economy have already recognised the benefits of broadband communications over satellite. You know the names: Abbey National Bank, American Express, BASF, BP, General Motors, Goodyear, L’Air Liquide, Peugeot, Statoil, TotalFinaElf, Visa, WalMart and many more. But what does satellite offer to these major corporations that other technologies can’t?

Corporate networks are maintained by

companies in a wide range of industries for internal communication needs, either by themselves or outsourced from service providers, and they use satellites to connect branch offices, factories or points-of-sale with each other or to centralised headquarters. Applications in this market include everything from videoconferencing to delivery of promotional videos to points of purchase, and from credit-card authorisations at teller machines or supermarket cashiers to telephone service to connectivity for offshore oil platforms. Demand for Internet access has also figured prominently as an application. As long ago as the turn of the 21<sup>st</sup> Century, demand for Internet services emerged as the dominant driver in VSAT-purchasing decisions worldwide.

Apart from lack of terrestrial networks in





many areas of operation, communications end-users are increasingly turning to satellites because the data they handle must be delivered simultaneously to numerous branch offices, whilst avoiding the complications of relying on multiple and disparate terrestrial service providers. Consequently, demand in this segment often arises even in areas well served by fibre-optic networks. The largest installed bases of VSATs currently are in the United States and Europe, where the automotive, retail, financial services and government-communications sectors are major users.

The companies that maintain satellite networks tend to procure satellite capacity through resellers or service providers rather than directly from satellite operators. Transponder leases in this market are generally small and rarely exceed terms of five years. Service quality tends to be a key consideration since applications – in the financial sector for instance – can be extremely intolerant of outages, and high-power satellites are generally preferred since they allow the use of smaller satellite antennas.

Telephone carriers, including fixed and mobile operators, use satellites to move (or “trunk”) long-haul traffic between telephone exchanges, along thin routes where terrestrial microwave relays or landlines are unavailable. Even when such infrastructure exists, they often need satellites as a back-up capacity. Satellite links may often be used to avoid transit charges and long transmission delays on routes where terrestrial networks do not allow direct connections, or are controlled by competitors. Satellites are also used in rural areas to provide telephone services directly to remote subscribers via satellite systems. Often, satellite links retained by telephone carriers provide their only connectivity on certain routes, and as such tend to be of critical importance to their core business – especially at a time when new fibre-optic construction has slowed down or stopped.

Under one set of conditions, let's say the point-to-point connection of major population centres both within and between countries and continents, fibre optic networks provide extremely reliable service delivery at cost levels which give good value for money. Cable provides similar value, only limited because it will only ever be laid around urban and sub-urban areas where it is economic to do so. DSL technology has the great advantage of bringing new bandwidth to old copper but it is limited because it only works within a maximum radius of three to five kilometres of the nearest local exchange carrier central switching office/exchange.

Even for a large non-metropolitan consumer population – and the tens of thousands of SMEs (small and medium sized enterprises) and SOHOs (small offices/home offices) located outside of cities and large towns – across a highly developed economy like the United States, access to these platforms is not necessarily available. For vast swaths of consumer and enterprise end-users across much of the planet, where geography and economics combine, these infrastructures are

a non-starter. In such circumstances, under such conditions, a question arises. How to gain access, obtain connectivity; for the rest of the world, to the rest of the world? The answer is – satellite.

#### Use of Satellite Applications in the Public Sector

Governments increasingly are using satellite services to provide expanded access by their citizens to ICT and Internet services, regardless of their geographical location. A particularly important aspect of this growth is for the development of rural telephony and e-government programmes. Governments have also begun developing programmes to support nationwide administrative networks, often assisted by development agencies. Many of these face considerable cost and availability barriers in utilising existing terrestrial telecommunication networks in areas outside the capital cities, and are finding a low-cost VSAT option to be ideal for linking remote institutions. Priority areas include larger administrative centres located outside the capital cities, such as provincial government offices, customs authorities, national research centres, the municipal authorities, police stations and hospitals and clinics.

Then there is education. There is considerable demand for Internet access in the education sector. For example, in Africa there is a need for connectivity between libraries and secondary and primary schools outside capital cities. Although this sector is chronically under-resourced, a number of governments and NGOs have already committed to improving school connectivity, one of which aims to link 700,000 schools, many via satellite. A variety of development agencies are supporting initiatives such as the World Bank's Worldlinks programme.

In terms of development, satellite applications are proving, again, to be invaluable for the three billion people on earth who are still without access to a basic telephone service. Satellite can and does provide cost-effective links to dispersed sites or small villages, most particularly, and importantly, in developing countries where the isolation of a greater proportion of the population can be overcome and they can be engaged in economic activity on an extended scale. Among the countries that are operating VSATs for rural connectivity are South Africa, Botswana, Indonesia, Chile, Peru, Kazakhstan, Bangladesh, Pakistan, Thailand, Ethiopia, Australia and United States to name but a few.

The Emergency Management community has also taken into account the proven track record that satellite communications have for providing essential emergency-management solutions. We need look no further than recent natural disasters such as the hurricanes Rita and Katrina, to the Asian Tsunami and the Pakistan earthquake to see that integral role that satellite has played in facilitating the provision of aid to stricken communities. This has been achieved in a cost-effective and efficient way. Satellite applications enable the arms of communication to reach regions of the world that otherwise would be isolated and

#### PUBLIC

- Distance Learning
- Rural Telecommunications
- Telemedicine
- Disaster Relief
- Government Closed user Groups
- National and Multi-National Networks
- Intergovernmental Applications
- Database Inquiry Services
- Utility-Monitoring Networks
- Medical Data Transfer and Tele-medicine
- ICT Embassy Networks
- Maritime Services

#### PRIVATE

- Internet Via Satellite
- Distance Learning
- Rural Telecommunications
- Disaster Relief
- National and Multi-National Networks
- Broadband Data Communications
- Multicast VSAT Services
- Corporate Applications
- PSTN Infrastructure Extension
- Aeronautical Links
- Land Mobile Communications
- Maritime Services
- News Distribution
- Computer Transaction Services
- Videoconferencing
- Video Monitoring Services
- Database Inquiry Services
- Bank Transactions and ATM Services
- Tourism Reservation Services
- Distributed Process-Control Systems
- Point-of-Sale Electronic Funds Transfer
- E-Mail
- Medical Data Transfer and Tele-medicine
- Sales Monitoring and Stock Control
- Satellite News Gathering
- Wide Area and Local Area Networks (WANs and LANs)
- Interactive Multimedia Services
- Stock market Broadcasting
- Real-time Financial- and Market- Information Distribution
- Digital Audio Broadcasting (DAB) Relay of Advertising
- Information Provision to Drivers Along Highways

would remain that way.

As we have seen, satellite applications have certainly come of age and are now have a plethora of uses in both the public and private sector, in our homes and where we work – in every area of society. The continued development of these applications will ensure that the future of telecommunication is open to everyone, everywhere. **GVF**