Emerging Opportunities in Satellite Communications

Internet via Satellite 2000

Management Summary

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The completely revised and updated 3rd Edition of the highly regarded

Internet via Satellite Report

Internet via Satellite 2000, published in March 2000, is the third edition of DTT Consulting's annual market research survey on the use of satellites for Internet services. It is an authoritative source of original and comprehensive data on the size and structure of the market. It provides the user with a wealth of contacts for potential ISP and service customers and a directory of all the significant suppliers in the market.

It shows actual size of and growth in the market over three years by sector and major geographic region and provides robust conclusions about key current developments in the IP over satellite business. It takes a bottom up approach to research, using data from end-users and service providers to estimate market size.

It offers a comprehensive list of web sites and email addresses and other information sources to provide an excellent base from which to conduct further research and keep up to date with rapidly changing developments.

We have drawn heavily on our peer group and the conference circuit to provide the most up-to-date thinking on using satellites for Internet traffic.

Our approach reflects many years of experience of consulting to new ventures and major organisations in satellite communications. During the course of writing the report we undertook a number of consultancy assignments related to its subject matter. We thus developed our thinking within a demanding environment of industry players.

In the new edition of the Internet via Satellite Report we have, for the first time, provided a major regional analysis of the marketplace.

Due to the rapid development of the IP over satellite business, the report has been considerably expanded and now extends over two volumes.

The **Internet via Satellite 2000** Report is 427 pages long. It includes 121 charts and tables providing statistics and summary management information on market size and structure. It details all the known satellite links between ISPs and backbone.

The report provides details of 338 key industry suppliers including satellite operators, service providers, companies offering hybrid access and multicasting and equipment and software vendors.

We have also identified, and provided web site addresses, for the majority of ISPs using satellite communications, thus providing a major source of potential sales leads.

If you want to subscribe, a form is attached to the rear of this summary. Alternatively just email us with what you want and a delivery address.

Internet via Satellite 2000 is aimed at satellite operators, satellite service providers, satellite manufacturers, telecommunications carriers, ISPs, manufacturers of satellites, manufacturers of professional and consumer ground equipment, R&D institutions, regulatory and policy makers, financial institutions, consultants, broadcasters and media companies.

Internet via Satellite 2000 is aimed at senior management, consultants, business development executives, sales staff and researchers needing both raw data and refined information and an understanding of the economics of the current and evolving marketplace.

If you require any further information, please do not hesitate to contact me, Roger Stanyard, personally, at DTT Consulting. I am the author of the report.

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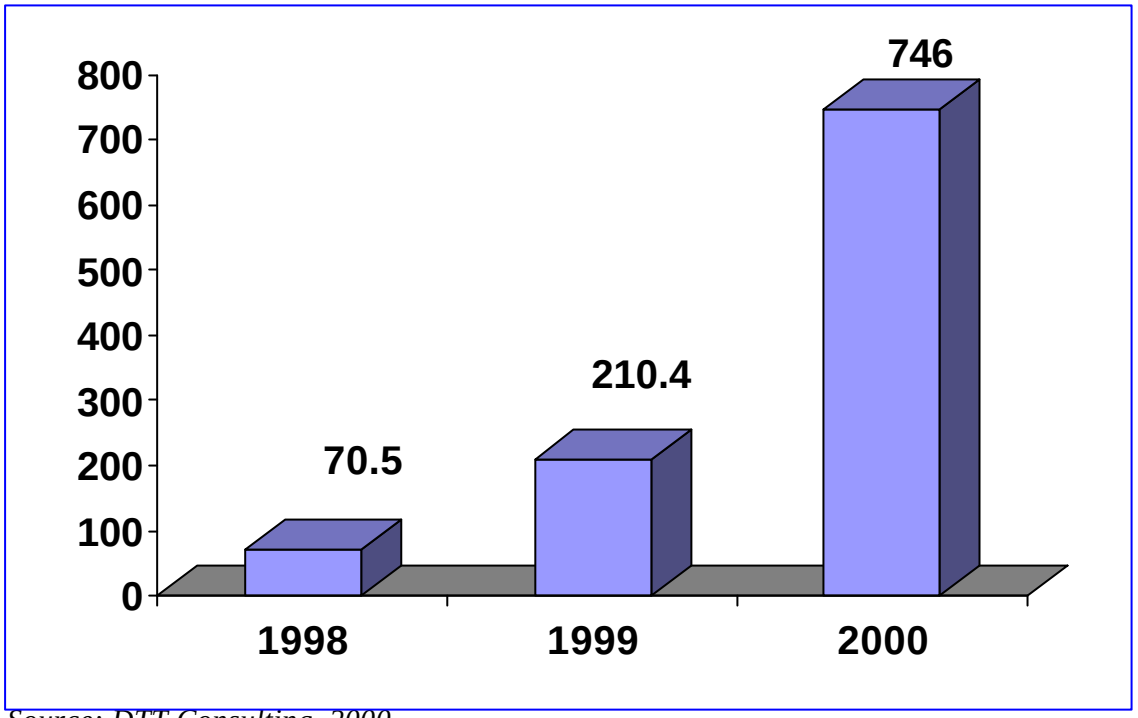
Value of Satellite ISP Link Marketplace, US$ millions, by Transponder Lease Value



Source: DTT Consulting, 2000

The major conclusion of the **Internet via Satellite 2000 Report** is that demand for satellite capacity for IP traffic has been growing exponentially. That growth has been headed by the demand for links between ISPs and Internet backbone.

The new 427 page **Internet via Satellite 2000** report provides the most thorough market research on the size, structure and direction of IP services using satellites. These services include ISP and backbone links, satellite caching and Usenet, one-way hybrid and multicasting services and the new generation of low cost two-way IP VSATs.

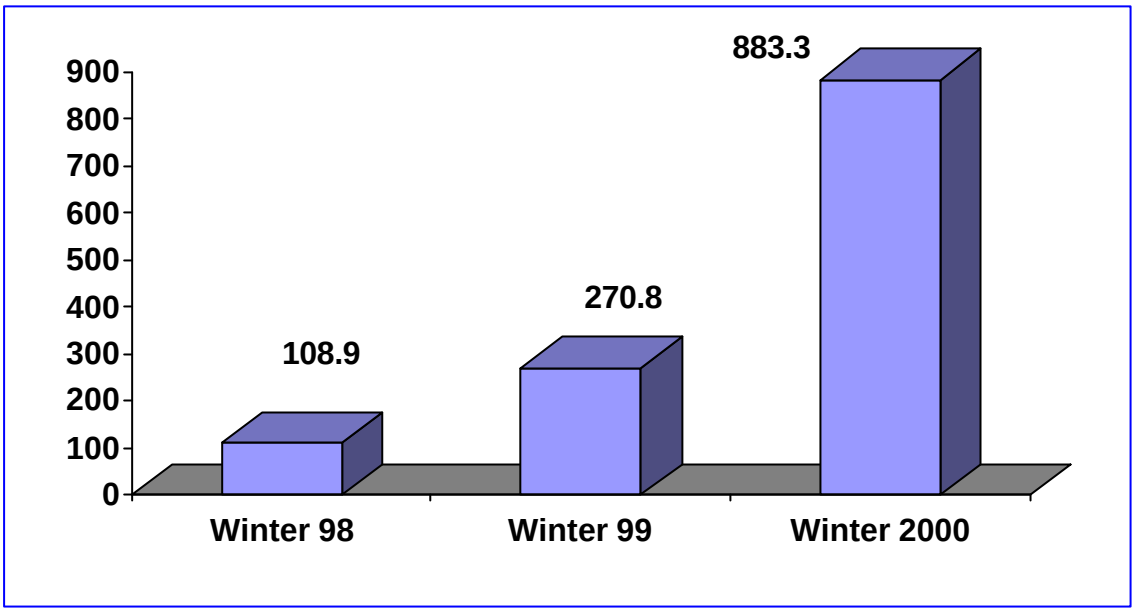
Over the last two years the annual Internet via Satellite report has become the industry handbook for what is a remarkable growth industry. In each of the three editions of the report we have been able to show a significant new market sector emerging as well as substantial growth and business opportunities.

Over 11% of the world's ISPs now use a satellite link to connect to Internet backbone. An increasing number are using satellite caching and multicasting services to improve performance and contain costs. Many are now looking to use two-way satellite terminals to provide high-speed Internet access to their corporate end-users, thus by-passing telcos and allowing the ISPs to keep control of their customers, revenue streams and networks.

New supply-side drivers which look set to drive the Internet via satellite industry forward include business-to-business e-commerce and rural communications.

The major geographic areas for growth for ISP links have been in Central and Eastern Europe, Turkey, Israel, Australasia, South America and South Africa.

Hybrid access services, though, have seen most of their growth in geographic areas close to the core of Internet, such as the USA and Western Europe.



Total value of the IP over Satellite Market, US$m

Source: DTT Consulting, 2000

For the last three years DTT Consulting has been researching the markets for satellite communications in the Internet environment. It follows on from research undertaken in 1997 on Ka-band satellite communications. We concluded that such multimedia satellite systems looked to be commercial sound but much of the economic analysis around focused on forecasting future demand across a variety of platforms (LMDS, cable, xDSL as well as satellite). We also found some continuing uncertainty about what services would emerge on satellite platforms – for example, there was a lot of talk about distance education and tele-medicine but it looked as if much of the thinking was supply rather that demand led.

We concluded at the time that an extremely useful way of understanding the evolving demand for Ka-band multimedia satellites was to look at existing evidence in the form of current demand for Internet services on existing satellites. In France Minitel has been a popular mass-market precursor to Internet since the early 1980s and it looks clear that the French commercial experience of consumer purchases through Minitel is a very good guide to the consumer e-commerce marketplace.

In our research into Internet via satellite two factors stand out over the last three years. There basically was no market in the Spring of 1997. Satellite traffic consisted of a handful of ISP point to point links on Orion and Intelsat, some pioneering work being undertaken by NetSat Express, partly off the back of philanthropic largess by the Soros Foundation, the DirecPC hybrid service and some academic/R&D links. (Ironically, the author of this report was an undergraduate at University College, London where the first satellite Internet link was installed – back in 1973.)

By the autumn of 1997 it was clear that Internet via satellite was becoming a significant market opportunity for satellite operators and satellite service providers. It needed some visionary thinking to release that anyone with a capability of moving vast amounts ("shed loads" is a popular colloquialism) of data around. Fortunately, we were consulting to a firm with just that sort of visionary.

The second matter which stands over the last two years since we published the first Internet via satellite report (Winter 1998) is that the structure of demand has been changing as we research.

In 1998 there were only two clear market segments which involved any significant amount of IP traffic. In early 1999 there were three. This year we have four. Maybe there will be a fifth next year.

Major Market Segments, Internet via Satellite

1998	1999	2000	2001
ISP links to Backbone Hybrid Access Services	ISP links to Backbone Hybrid Access Services Caching & Usenet Feeds	ISP links to Backbone Hybrid Access Services Caching & Usenet Feeds 2-way access services	ISP links to Backbone Hybrid Access Services Caching & Usenet Feeds 2-way access services Voice over IP (trunking/VSAT)

We have not included satellite-based voice over IP for 2000 because it has not yet commercially proven itself. IP over satellite is largely about connecting remote areas to US and European backbone. It is these areas which also tend to have very high switched circuit call costs for long distance and international traffic and we thus believe that satellites provide a major opportunity for VoIP in such countries as Russia. It is our view, though, that the user proposition must be both simple and equal in quality to switched circuit calls.

The jury is still out on the commercial viability of using the DBS set-top box as an Internet access device. On the other hand it remains our view that IP will be the platform for TV viewing of the future.

The most promising short-term development in IP over satellite is the emergence during 2000 of a number of two-way satellite-based Internet access services such as that provided by Tachyon and the Gilat-to-Home operation. DirecPC has booked ten transponders on Satmex 5 for such a two-way service in Latin America.

These services are characterized by relatively low cost terminals and shared bandwidth giving nominally very low space segment charges. But, even in subsidized form, these look to be priced at well above the consumer acceptance point. In our view the likely demand for them centers on business to business e-commerce in such areas as supply and distribution chain management.

In contrast, the set-top-box approach models developed so far are much more clearly based upon business-to-consumer e-commerce.

We also note the start of new innovative IP services in 1999/2000 such as Telespazio's traffic monitoring network which uses Comsat Linkway equipment. However, these specialised services are not yet (in total) bandwidth hungry.

Fibre v satellite: There is no doubt in our minds that in the current biggest market segment, for IP over satellite links, fibre dominants the marketplace. Back in 1998 we suggested that many of the satellite links were short-term measures intended only for use until fibre comes along. The anecdotal evidence from our research into the Internet via Satellite 2000 report supports this. There is already a discernable shift of traffic from satellite to fibre amongst ISPs in Central and Eastern Europe.

Some major satellite service providers with large operations in supplying satellite ISP links are now investing in fibre. Impsat, now with a turnover exceeding $200 million a year, is a good example. It is involved in Global Crossing.

Indeed, even in markets where we might expect satellites to have a competitive market advantage in serving ISPs, incumbent carriers look to be rapidly developing there offerings based on fibre. We include VSNL (the hitherto Indian monopoly international carrier) and Pakistan Telecom amongst this category. Only in South Africa amongst the major Internet countries (it ranks about 20th) was satellite seen to be significantly cheaper (in general) than fibre but Telekom SA retains monopoly power on international traffic.

It appears that ISPs (in Central and Eastern Europe at least and we suspect in many other areas) are unwilling to take out contracts with satellite service providers which last more than a year or two.

Nevertheless, the satellite operators and service providers have an opportunity in extending their service offering to ISPs as detailed above. Satellites will retain a competitive advantage in multicasting and broadcasting modes and in serving remoter regions. Current market trends also support the hypothesis that they have a local-loop role because full-service-network fibre has failed.

Service providers and teleport operators may need to consider whether the ISPs are best served by them using on-premises satellite connections or connecting to satellite through local, regional or major international gateway teleports. The evidence over the last year suggests a swing towards using teleports rather than on-premises earth stations. About half of ISPs using satellite links to backbone are using teleports rather than their own on-premises terminals.

This is partly because of specific local market conditions in such countries as Brazil and Australia. In general, though, ISPs have sufficient demand for capacity to justify local loop fibre before international fibre is installed. There are also economies of scale with big carriers being able to wholesale space segment through using local teleports.

Ka-band Developments: The big infrastructure developments over the last year have been in the Ka-band arena with the financing and start of construction of the Spaceway and Astrolink projects. The non-geostationary projects remain very difficult to finance in the aftermath of the financial and market problems of Iridium and ICO; it has been our prediction that Teledesic will launch service off-of geostationary satellite capacity. We can't see how it can't.

All of the satellite operators have some form of Ka-band plan but a number have been moving from spectrum hoarding to defining and financing real projects. Over the last year, the market has moved from a handful of satellite operators carrying significant amounts of IP traffic to virtually all of them carrying, or pushing to carry, IP services of some form.

Conventional, broadcast-led, business models used by satellite operators now belong in the last century.

Caching, Multicasting and push technologies: The demand for caching and push–based satellite IP services has not proved to be great but, we believe, demand for such applications may still burgeon as xDSL and other high-speed terrestrial networks are rolled out.