



Photo courtesy of Rawpixel.com/Shutterstock

Expanding service portfolios in underserved regions with hybrid satellite-cellular solutions

While consumers in regions like Northern America and Western Europe take access to high-speed broadband as a given, less than 50 percent of the world's population is connected to the Internet. To meet the growing demand for high-speed connectivity in remote and underserved areas, satellite is an obvious solution. However, its expense limits uptake to the extent that several communications companies have been looking into more cost-effective alternatives. As part of this aim, Gilat and SES recently launched a hybrid broadband solution based on Gilat's SkyEdge II-c Libra terminal transmitting over the SES-9 Asia-Pacific satellite. Doreet Oren, Director of Product Marketing at Gilat Satellite Networks, discusses the challenges to providing global connectivity, and how hybrid satellite-cellular solutions may provide the answer.

Most of us reading this article take Internet in our homes for granted. However, more than half of the world's population remains unconnected, with no access to the social, political and economic benefits of the Internet. Broadband remains unavailable, inaccessible and unaffordable for the majority of the world's population.

The current connectivity methods do not answer the broadband needs of the majority of the population. I would like to propose an alternative to the current technologies based on an innovative hybrid satellite-cellular terminal. This solution not only contributes to closing the digital divide, but also represents a profitable service expansion for MNOs and DTH providers.

The connected world is composed mostly of homes in

urban areas where solutions such as fibre, DSL and cable modems are available. On the other hand, the under-connected world, primarily rural regions in developing countries, have little to no terrestrial infrastructure. The only solutions for these regions are cellular and satellite. Let's examine the pros and cons of each.

Cellular is the most common solution for the delivery of broadband to the home in unconnected areas. The most obvious advantage of cellular is that it is everywhere. Research shows that mobile coverage is indeed ubiquitous, although most users do not have access to broadband. The biggest disadvantage of the massive cellular coverage is inadequate performance. Ookla's speed tests for median download performance on handsets in countries like

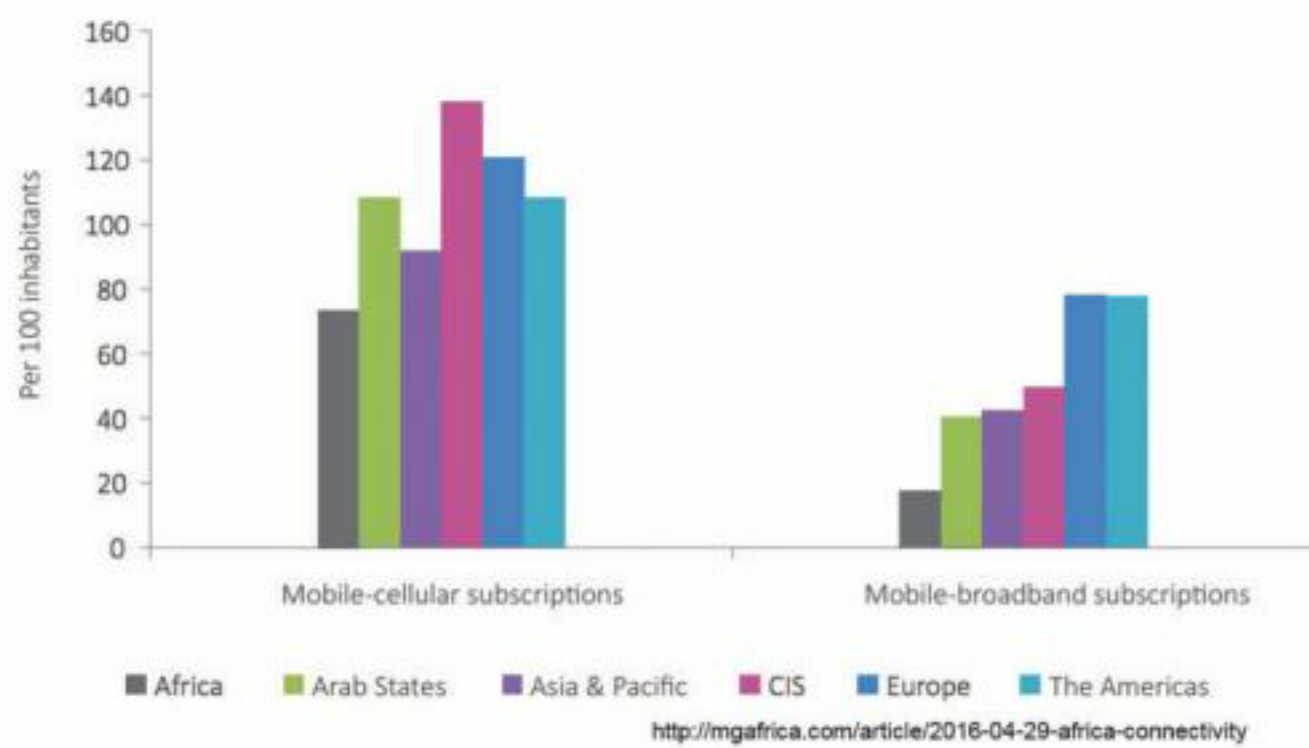


Figure 1: Mobile Subscriptions

Argentina, Brazil, Indonesia, the Philippines and Vietnam, show data rates of less than 2Mbps – speeds that are unable to support broadband.

Alternatively, satellite is really the only solution for the delivery of broadband to the home in unconnected areas when terrestrial or cellular coverage is not an option. In addition, VSATs have the advantages of high performance and quick deployment. However, even though a VSAT solution is possible almost anywhere on the planet, the cost of the terminal is often too high for consumers in emerging markets.

The cost barrier – the major factor preventing broadband connectivity

Clearly, in emerging markets, the cost barrier to the consumer is a key factor. The cost of broadband connectivity, for both equipment and services, is beyond the reach of most of the low-income households in emerging markets.

In cash-based economies, where business is often conducted according to a prepaid model, a home VSAT terminal costing hundreds of dollars cannot be amortized over the course of monthly service payments.

In research we conducted on broadband VSAT price elasticity, we found that in regions such as Eastern Europe, LATAM, Asia, Africa and the Middle East, cutting the terminal

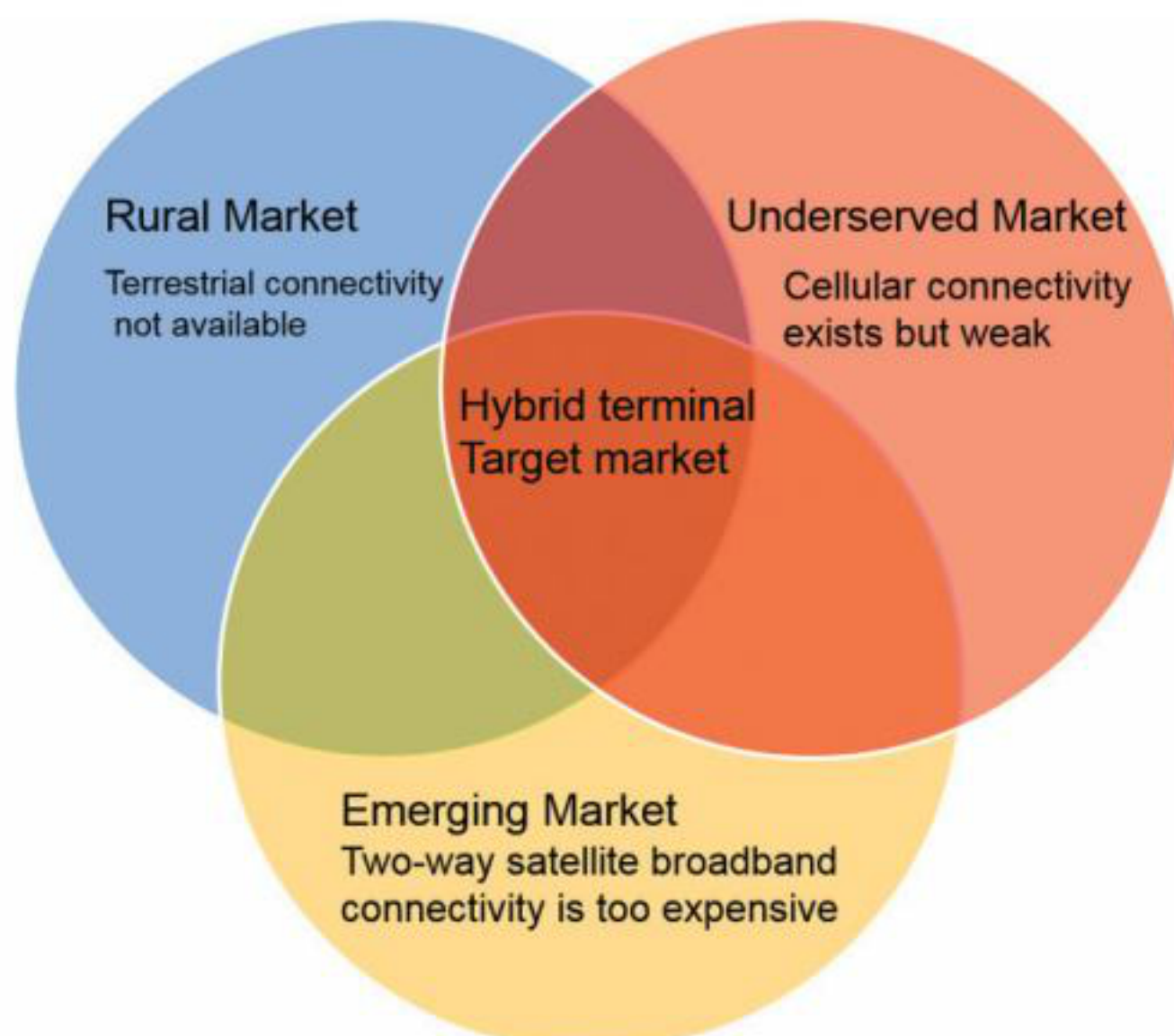


Figure 2: Hybrid Terminal Market

cost in half would more than double the subscriber base.

A hybrid satellite-cellular solution – the best of all worlds

What if we could combine the ubiquitous nature of cellular with the high performance of satellite – and also keep costs down to a minimum? What would be the market for such a hybrid terminal?

Let's examine the following three markets for broadband in underserved regions. As illustrated in Figure 2, the overlap is the target market for the hybrid terminal:

- Rural market, where terrestrial connectivity is not available
- Underserved market, where cellular connectivity exists but cannot adequately support broadband
- Emerging market, where two-way satellite broadband connectivity is too expensive

A hybrid solution, that combines satellite with cellular or terrestrial technologies, would leverage the asymmetrical nature of data traffic to and from the home. Since consumers download much more than they upload (by a factor of about 15 to 1), we can use satellite for high-speed downloads and either cellular or terrestrial for upload traffic. This hybrid terminal would deliver high-quality broadband at a significantly lower cost than a full two-way VSAT.

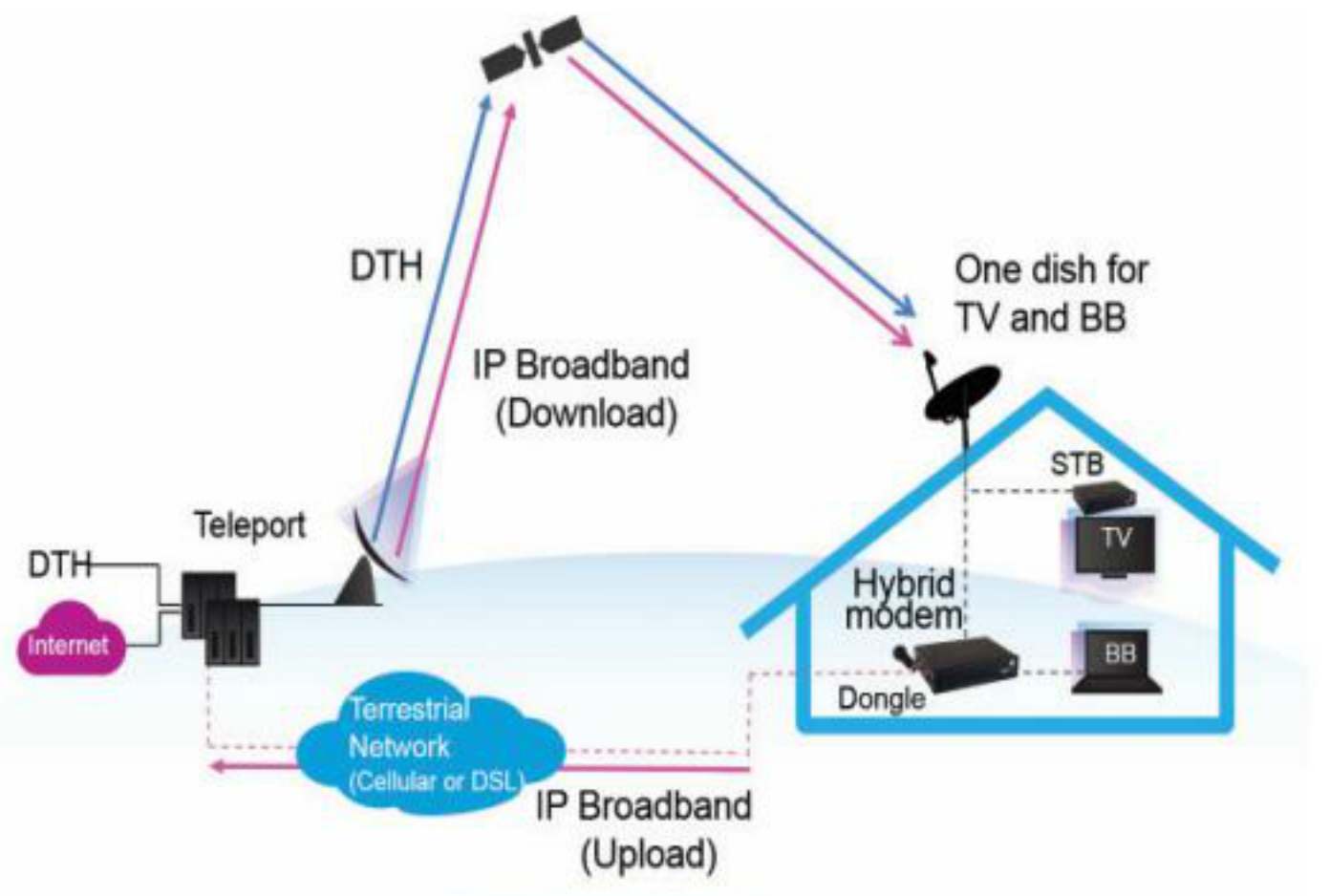


Figure 3: Hybrid Terminal Solution

How does it work?

In Figure 3 you can see the satellite link for download. The one-way home antenna can be used for receive-only for both TV and broadband. The satellite capacity can be used for both DTH and IP broadband download, providing up to 20Mbps. This is significantly higher than the 2Mbps average, and sufficient for broadband connectivity. In the upload direction, either the cellular network or home-to-Internet DSL can be used. As home-user usage patterns validate, these slower speeds are more than sufficient for the much lighter upload traffic.

Value for consumers

For consumers, a low-cost terminal for home broadband is an exciting proposition. Furthermore, if already engaged with a DTH provider, it would be easy for a subscriber to expand the existing service to broadband.

There are only three elements required for a simple, low-cost installation:

1. A basic, receive-only outdoor antenna (in most cases an existing DTH antenna and LNB can be used)
2. An indoor hybrid satellite modem/router
3. A standard cellular USB dongle

Value for DTH providers

Global DTH penetration is expected to increase from 16 percent today to 22 percent by 2023, according to Northern Sky Research (NSR). Low-cost, receive-only satellite dishes for TV reception can already be found on the rooftops of tens of millions of homes, with more on the way.

With a hybrid terminal, only minor modifications would be needed to convert a one-way architecture into a two-way system, enabling both video and Internet to be transmitted to the same DTH dish.

By leveraging their existing satellite infrastructures and distribution channels, DTH providers would be able to benefit from triple-play services. The same antenna and LNB can be used to support both broadband and DTH from a single orbital position, or alternatively, an additional LNB can be added to support connectivity from two different orbital positions.

Value for MNOs

MNOs can use 2.5/3G cellular for uploads and satellite for 20Mbps downloads without congesting their networks. This holds true even in a 2.5G network with upload traffic of only tens of kilobits per second. By providing consumers with a low-cost, high-performance hybrid terminal, ARPU can be



Figure 4: Hybrid Consumer Equipment

increased and customer loyalty sustained.

A reliable broadband service would enable providers to increase customer retention in underserved areas, as well as broadband penetration in suburban and rural underserved areas.

Summary

DTH providers and MNOs can leverage their existing infrastructures to profitably expand their service offering to include broadband delivery. This can be done with a hybrid solution using high-throughput satellite (HTS) capacity for the download direction and existing cellular or terrestrial connectivity for the upload direction.

The hybrid solution would be an affordable proposition for consumers in rural, underserved and emerging markets. Our price elasticity model shows that, in these developing economies, reducing the terminal cost would significantly increase the subscriber base.

A hybrid solution bringing broadband to underserved markets is an unmet need and represents a huge market opportunity.



Photo courtesy of psynovec/Shutterstock