



## Satellite efficiency can drive much-needed savings

Improved network engineering and design can lead to lower bandwidth use costs

- **By Dwight Hunsicker**
- **Mar 03, 2011**

In today's network-centric world, with the convergence of voice, data and video over IP, it's all about moving the most bits possible through a network while using the least amount of bandwidth possible.

Budgets are tightening across the board, and everyone is still being asked to do their job, albeit with less funding. In many cases, some are being asked to increase operational tempo despite funding cuts. For networks with a satellite communications component, this is even more paramount because of the relative cost of the bandwidth. When assessing network requirements, the goal is to maximize the number of bits per hertz to minimize costs.

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In the best-case scenario, network systems engineers have multiple variables at their disposal to optimize the satcom link, including satellite parameters, terminal specifications, modulation and coding techniques. If engineers control all those parameters, the right network engineering and design can lead to lower bandwidth usage costs and, if done right, more optimal usage, allowing users to do more with less.

Most satellite networks use IP as the means of transporting data. IP serves as a common denominator, allowing for the transport of a customer's converged network traffic using a single satellite circuit. In addition, IP-centric Time Division Multiple Access satellite access techniques let multiple users in different locations share a pool of bandwidth on a common network. Although older dedicated bandwidth technologies, such as single-channel services, can provide the most bandwidth-efficient solution on a single-site basis, the shared nature of a TDMA architecture provides for more flexibility and reduces overall satellite bandwidth requirements for multiple sites.

In the satellite industry, labels such as operators, resellers, integrators and managed service providers are used to define various businesses that provide services. Regardless of the label, those who really pay attention to the math can maximize value for customers and users. In turn, that leads to happier customers, which translates to higher retention rates and margins and the reassurance of providing best value.

However, for that to happen, the customer, user, program manager and procurement personnel need to capitalize on the methods of optimizing the number of bits per hertz. For situations in which a true end-to-end solution can be procured, that is the most ideal situation.

That guidance holds true for military satcom systems and networks, too. The bandwidth of recently launched U.S.-based milsatcom satellites is being consumed by high usage demands from the intelligence, surveillance and reconnaissance community. Thus, users of these milsatcom systems — and others who want to access the systems — also need to do more with less bandwidth.

In a recent side-by-side competition of terminal equipment, a range of efficiencies in terms of transmit and receive efficiencies were noted. Higher efficiencies quickly translated into less satellite transponder resources required for the same level of throughput. All of a sudden, a couple of decibels makes or breaks the link budget — and the financial budget relative to commercial satcom services.

In other cases in which a satellite terminal is already on hand, the modem is specified or the satellite is selected or provided as government-furnished equipment, there are fewer variables, thereby minimizing the ability to achieve and realize optimization. In those cases, network and link optimization techniques and appliances that provide compression, acceleration and caching functionality can be employed to lower the effects of data transfers across the satellite network, thereby reducing overall aggregate satellite bandwidth for the network.

In times of such budget uncertainty and anticipated belt-tightening, optimizing your network by integrating technology systems that maximize the number of bits per hertz is critical to doing more with less.

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