

## The Last Mile – The Role of Free Space Optics



The world telecommunications market is facing a revolution. Spurred on by telecommunications liberalisation, small Competitive Local Exchange Carriers (CLECs) are starting to take business from the

Incumbent Local Exchange Carriers (ILECs). The key to their success is their ability to move quickly, and provide services where and when the customers want them.

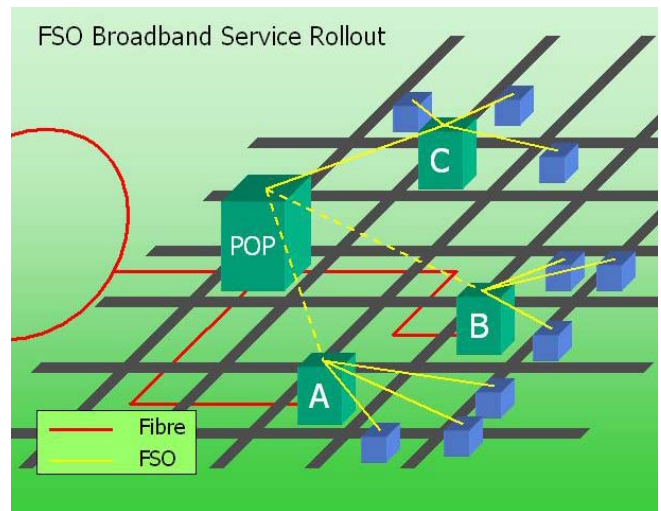
The broadband market is new territory for the ILECs. They have come from a world where extremely high availability is a key business driver. There is a perception that core network and voice networks must run at 99.999% availability, the so-called 'five nines', for a network to be a viable business. The new world of broadband, based on TCP/IP is less demanding. The broadband local access network technology, based on Ethernet, is flexible enough to operate in a non five-nines environment.

The traffic patterns are also changing. TCP/IP traffic now accounts for a greater percentage of traffic than voice and other data traffic combined! It is predicted that the voice traffic percentage will further decline over the next 10 years. The rise of IP traffic is being driven by the increasing sophistication of Web/Internet users. Simple connections have given way to high bandwidth graphics and multimedia content. These will in turn migrate to higher bandwidth interactive content. It is easy to see why bandwidth requirements are escalating.

Existing ILEC infrastructure is largely based around copper infrastructure in the last mile. Fibre has been installed, but mainly into the core of the network. This infrastructure is struggling to cope with the bandwidth requirements of the Small to Medium Enterprise (SME) customers, which is growing exponentially. The growth in the build out to large/medium businesses, which is largely fibre based, is declining. This leaves the ILECs with no clear means of expanding their broadband services market other than an expensive fibre rollout.

Because of these issues, carriers are missing the large, lucrative user base that is the small to medium enterprise needing the bandwidths that until recently only fibre could provide. The return on investment for fibre infrastructure is simply too long for their business models. Most of these customers are within a kilometre of a Point of Presence or fibre ring, but are very price sensitive and reluctant to pay up front for the fibre provisioning costs.

The carriers need to address this market, creating seamless, high speed infrastructure in the local access environment. They need to find a solution to the limited willingness of these SMEs to pay for custom fibre deployment, and also see rapid return on investment. Once the deployment and infrastructure challenges had been met, IP based services offer the carriers new revenue opportunities in the form of service and content provision. Nowhere are the revenue opportunities so great as in this last mile marketplace. CLECs are competing aggressively with the ILECs. Cost effective service provision is the key to winning in this market.



Free Space Optics is a line of sight, wireless technology, providing high data rates over invisible beams of eye-safe infrared light. The technology is uncomplicated and reliable, with 'fibre-like' connectivity.

Compared with fibre, and other radio technologies, Free Space Optical infrastructure costs are extremely competitive, typically 10-20% cheaper than a microwave system, with no spectrum licensing required. This means that the return on investment period for services based on Free Space Optical Systems are typically six months, compared with a year for microwave or three years for a fibre optic based system.

PAVLight Free Space Optics Systems are designed to be easy and fast for carriers to deploy giving bandwidths of up to 1Gigabit per second, installed in hours rather than months. Free Space Optics can be used to 'kickstart' the revenue stream from an area, following up with a fibre rollout when revenues are sufficient to justify the cost. The FSO link can then be either redeployed or retained for backup purposes.