OPTICAL FIBER FOR BROADBAND

Evolution of web-based communication applications has been driving the bandwidth demand across the world, says Keith D’Silva

Ubiquitous and cost-effective public and private broadband networks are as important today, as telecom networks were in the previous decade. Absence of inexpensive non dial-up option is a major stumbling block for a country’s growth. Recognizing the potential of ubiquitous broadband service in the growth of India’s GDP and enhancement in the quality of life through societal applications including tele-education, tele-medicine, e-governance, entertainment, as well as employment generation by way of high-speed access to information and web-based communication, the government has finalized a policy to accelerate the growth of broadband services. India is at a critical juncture in its roll out of ‘True’ broadband. India’s Broadband Policy 2004 was finally released in October 2004 and it defines Broadband as “An ‘always-on’ data connection that is able to support interactive services including Internet access and has the ca-
pability of the minimum download speed of 256 kilo bits per second (kbps) to an individual subscriber from the point-of-presence (POP)”. The Broadband Policy Framework visualizes creation of infrastructure to support high bandwidth applications, through various access technologies, which can contribute to growth and can mutually co-exist.

**Drivers for Broadband**
The evolution of web-based communication applications has been the key driver for the bandwidth demand across the world. There is a strong desire to have access to all information/data/entertainment at all times at all places. With popular applications like remote disk backup at centralized secure servers gaining popularity, transmission medium is becoming critical.

**Technologies for Broadband**
There are several established solutions that are capable of supporting broadband connectivity. The fiber-based technology is capable of nearly unlimited bandwidth potential, and provides the capacity required to deliver triple-play services, while simultaneously offering the farthest reach. Fiber is steadily replacing copper network especially in intra-city backbone networks. Hybrid Fiber Coaxial (HFC), Fiber to the Curb (FTTC) and Fiber to the Home (FTTH) networks make use of fiber cabling into the last mile. The fiber based models are future proof as they are able to provide huge amounts of bandwidth in the last mile, as well as provide a true IP and converged network that can deliver high quality voice, data, and video. In India, BSNL has started to deploy high fiber count ‘Ribbon Optical Fiber Cables’ in intra-city backbone networks and thus has brought fiber closer to the subscriber. A comparative viability assessment by Confederation of Indian Industry (CII), of the available technologies, also yields that DSL over fresh copper is clearly not a viable business model. However, DSL over existing copper, HFC over upgraded cable and fiber based options considered in the analysis, prove to be very close to each other in terms of business viability from the comparison of IRR, cash break-even and cash payback period. From the economic viability stand, in the past, the exorbitant costs

### EVALUATION OF TECHNOLOGIES FOR BROADBAND

<table>
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<tr>
<th>Wireless</th>
<th>ADSL on PIJF Cables</th>
<th>HFC on Data Cables</th>
<th>Fiber</th>
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<tbody>
<tr>
<td><strong>Downstream Bandwidths</strong></td>
<td>200+ kbps connectivity with WiMAX / MMDS, up to 10 Mbps connectivity is possible</td>
<td>From 1.5 Mbps to 12 Mbps</td>
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<tr>
<td><strong>Upstream Bandwidths</strong></td>
<td>Wide range based on technology option</td>
<td>From 256 kbps (on ADSL) to 12 Mbps (on SHDSL)</td>
<td>Cable system is basically a downstream design</td>
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<tr>
<td><strong>Leverage on Existing Infrastructure</strong></td>
<td>Possible on existing infrastructure/fresh access networks would be required</td>
<td>Existing twisted pair, reducing incremental costs</td>
<td>Existing Digital TV class HFC systems, reducing incremental costs</td>
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<tr>
<td><strong>Maturity of Solution</strong></td>
<td>Some technologies are mature (LMDS/MMDS), and some are evolving (Wi-Fi/WiMAX)</td>
<td>60% of global broadband based on DSL</td>
<td>35% of global broadband based on cable</td>
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<tr>
<td><strong>Long term prospects</strong></td>
<td>Technologies and standards that are still evolving, would determine this</td>
<td>Replacement by optical fiber cables</td>
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connected with the deployment of an FTTP network, the related equipment costs, high IRR among others were the main deterrents. However, with the increase in commercial availability of fiber technologies in recent years, the cost of fiber rollout is approaching the cost of other wired networks.

**Broadband is here to stay**

The challenge is clear. Service providers are looking to Fiber-to-the-Premises (FTTP) systems as the viable alternative to current broadband access technologies. FTTP is now viewed as the cost-effective and future-proof conduit to provide high-bandwidth “triple play” services (voice, video, and data) to residential and business customers. With a clear collective initiative being taken by the Government, regulatory bodies, key incumbents and service providers, the time is right from a competitive, regulatory and market vantage point. Now as fiber deployment costs steadily decrease, telecom equipment vendors face the challenge of designing and deploying FTTP systems to achieve India’s broadband vision.
Biographical Information

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Keith D’Silva is responsible for Corporate Communications and Media Relations at Sterlite Optical Technologies.

Previously, Keith D’Silva was a Business Manager, responsible for sales of Sterlite’s Optical Fiber products in the Middle East. Keith D’Silva joined Sterlite in 1998 and has held various positions including manufacturing and business development.

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