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It's a long haul to meet future broadband demand

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In recent years, there has been a burgeoning demand for broadband network access. For example, video-sharing sites have become arguably the fastest-growing applications on the Internet. According to the Internet Innovation Alliance (IIA), YouTube was using as much bandwidth in 2007 as the entire Internet consumed in the year 2000. With broadband penetration

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breaking the 50 percent mark and consumers rapidly adopting high-bandwidth applications, the telecom industry continues to experience a surge in bandwidth growth.

Increased bandwidth demand is not limited to consumers. Enterprise applications, such as high-definition videoconferencing, are using significant bandwidth. While these activities have had a positive impact on electronic commerce and social interaction, the effect on the fiber "pipes" feeding us all this information is far less encouraging. The Internet is becoming a freeway at rush hour, and the gridlock is only going to get worse.

Where some see the explosive growth in demand for broadband services as a cause for concern, investors see opportunity and a need to prepare. The impending bandwidth crunch has as much or more to do with business models and network architecture as with technology.

Due to the price sensitivity, service providers are hesitant to be the first to bring their cost structure in line with the resources they provision. Instead, their pricing models encourage the use of high-bandwidth applications, while, at the same time, they neglect to invest in the infrastructure needed to keep up with demand. They need to look to new pricing models and existing fiber assets.

Why new pricing models?

Unlike the pricing models we are accustomed to from utilities, where you pay for the resource you use, Internet access pricing is driven more by connection speed than by bandwidth used. Faster plans cost more and lower-speed plans less. On the other hand, the carrier pays for bandwidth at a fixed cost per megabyte per month. This creates a disconnect between the cost of the resource and the amount of resource used.

Consumer adoption of high-bandwidth applications over a broadband pipe invalidates retail carriers' current network engineering design assumptions. The driving factor is the requirement for a significant increase in the committed information rate (CIR) per subscriber. For example, a carrier might pay $20 per megabyte per month for bandwidth, but then resell seven megabytes to subscribers for $40. It is possible to assume this low a CIR per subscriber when not all the users consume all the bandwidth to which they are entitled. Now that millions of people are using these applications simultaneously, the odds of experiencing less-than-desired speed and service quality grow exponentially. The economic model no longer works. Increased CIR per subscriber requires more conservative access network sharing ratios, increased capacity to access concentration devices and a dramatic increase in backbone

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Internet capacity.

To ensure that customers get the quality of service they have come to expect, pricing models must be brought more in line with costs, and market participants must decide who pays to get content to the consumer. Is a consumer willing to pay for dedicated access to download large amounts of content? Internet providers are starting to look at consumption-based subscription plans. Or, perhaps a content provider wants to be known for delivering high-quality content at a certain speed and service level?

While pricing models are evolving, it is clear that the existing fiber infrastructure will increase in value over time. The fiber carrier industry has undergone significant consolidation. This has improved the overall supply/demand equation and stabilized pricing. In addition, the industry's physical and capital barriers have precluded new "greenfield" backbone builds.

As a result, a significant opportunity exists in leveraging current fiber networks to provide high-bandwidth services. Existing carriers are well positioned to provision these services in an incremental, success-based manner that ties capital requirements to contracted revenue and greatly mitigates the risk of building out in front of demand in a capital-intensive industry.
Even the most pessimistic don't believe that the Internet will come to a crashing halt; it's more likely to degrade to dial-up-like speeds. Making the most of existing capacity will buy us time while we make long overdue upgrades to our infrastructure. The growth in applications driving the explosion in broadband demand promises innovation, opportunity and economic growth, as long as we are prepared.

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