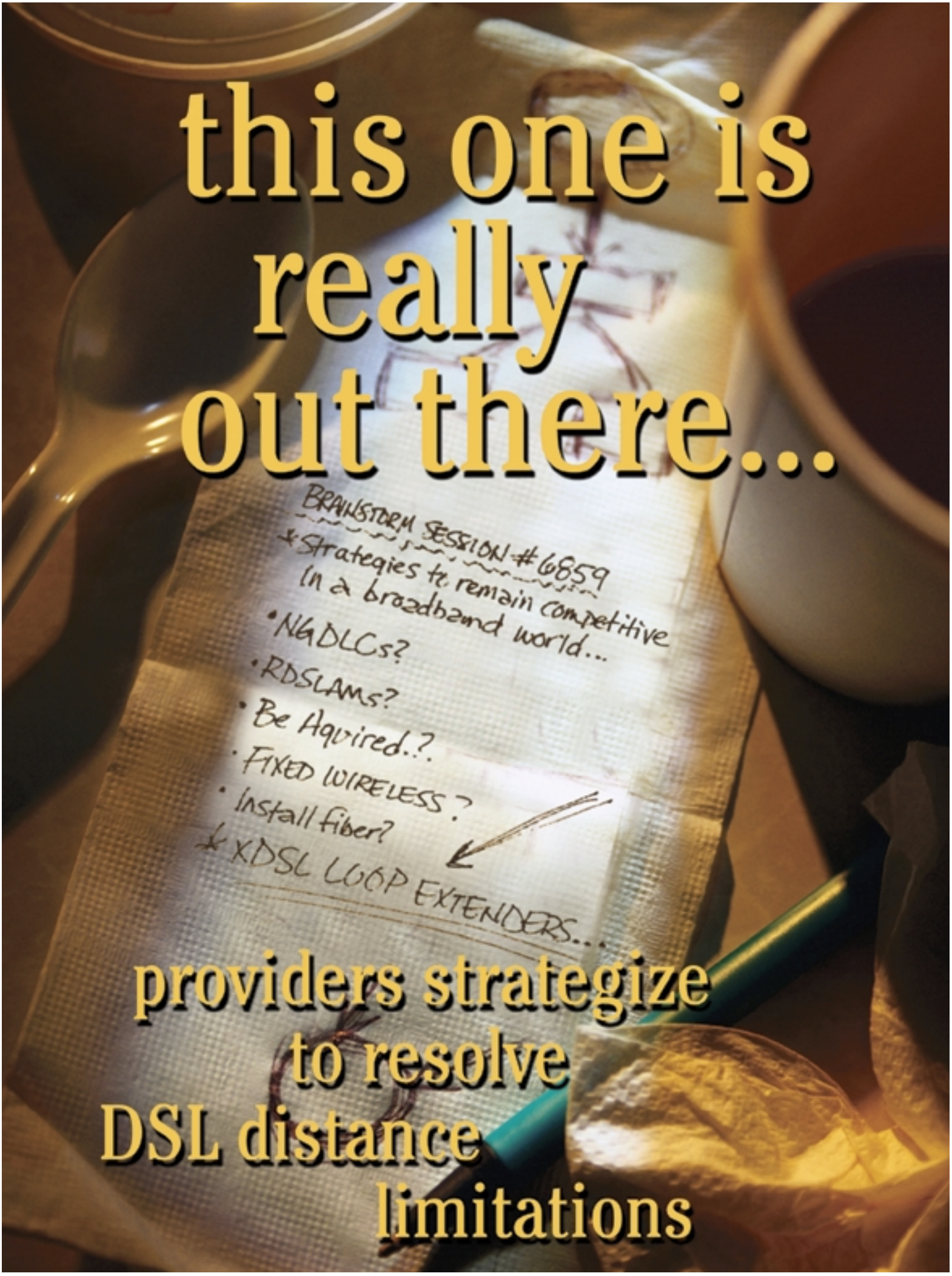

this one is really out there...
BRAINSTORM SESSION #6859
*Strategies to remain competitive in a broadband world...
• NG DLCs?
• RDSLAMs?
• Be Aquired..?
• FIXED WIRELESS?
• Install fiber?
* XDSL LOOP EXTENDERS...
providers strategize to resolve DSL distance limitations

By Barry Dropping

With intense competition for broadband access between cable companies and telecom providers, cable companies have the advantage of being out of the gate faster. Yet the growth rate of DSL is currently higher. For telecom providers to win a large share of this market, however, they need to speed up DSL deployment. And as we all know, its range limitation is one of the more pressing hurdles they must address.

The range limitation of current DSL means that two out of five consumers (about 40% of the market) are currently out of reach. This represents about $1.4 billion in annual revenues, taking only the current size of the market into account. One thing to stress here is that the annual revenues are just the beginning; value-added services that ride on top of a broadband connection are coming, so there is a huge potential to the annual revenue projections and a huge downside to losing this market.

Pushing the Limits

With the typical architecture for an xDSL installation, the distance from the DSLAM to the CPE can be no more than 12 Kft (2.25 miles). Beyond that distance, xDSL deliverable bandwidth rolls off to an unacceptable level to provide broadband service. A further complication is that many suburban and long-reach customers' phone lines are served from Digital Loop Carriers (DLCs). However, many DLCs are not compatible with DSL in their original state.

Carriers have several options to overcome DSL distance limitations. Depending on the projected market, rollout budget, and speed required for implementation, one of these options or a mix of them would be the right answer.

Next-Generation Digital Loop Carriers (NGDLCs): These would replace the current generation of DLCs that are not DSL compliant. The expense of implementing this is quite high, however. New NGDLCs must be planned for, built and provisioned appropriately. Clearly, this option makes sense where there is a large (typically over 200 DSL subscribers) and relatively assured market waiting to be tapped when their infrastructure upgrade is performed.

Remote Access Multiplexers (RAMs): Like the NGDLCs, RAMs are an upgrade that may make sense in the long run, depending on the environment in which they are to be installed. All of the arguments that apply to the NGDLC apply to the RAM as well; their installation will make business sense where there is both a high enough subscriber concentration (typically over 50 subscribers) and the time necessary to make the upgrade.

Remote Digital Subscriber Line Access Multiplexers (RDSLAMs): Like NGDLCs and their smaller cousins, RAMs, this strategy makes sense when the subscriber base exists and the time for installation is flexible.

Fixed Wireless: This option includes LMDS and MMDS technologies. Sprint, for example, is offering MMDS to customers who are well beyond the range of current technologies allowing broadband delivery. However, the cost of fixed wireless is prohibitive unless there is a fairly concentrated market that offers hundreds, if not thousands, of customers within a 30-mile radius.

Loop Extenders: Mid-span extenders offer a cost-effective and time-saving solution to extend the reach of ADSL. A carrier can secure the ability to extend the reach of the DSL services up to 30 Kft without major upgrades to the infrastructure. The external portion of the loop extenders can be

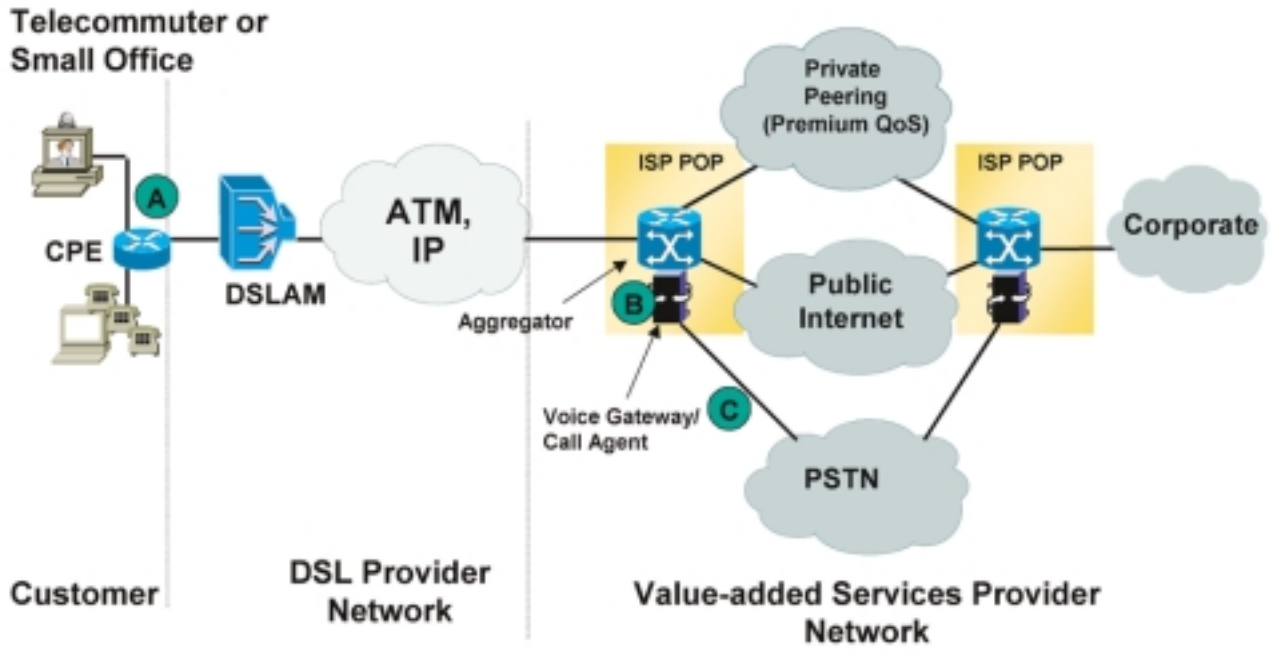
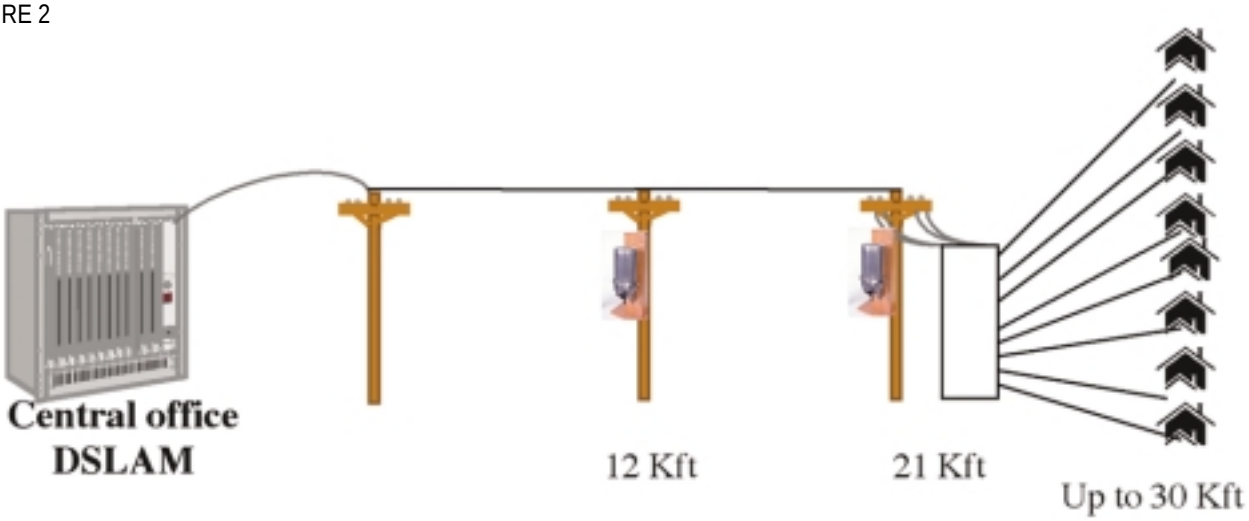


FIGURE 1

FIGURE 2



mounted in existing terminal boxes or even on poles. They can be placed as a single unit or in batches of 6 to 24.

Laboratory and field trials in New York, New Jersey, South Carolina, North Carolina, Montana and Canada show that loop extenders such as the GoLong product extend data rates at a minimum of 1.5 Mbps downstream and 256 kbps upstream.

The overall architecture is illustrated in Figure 2. There are two elements to such a solution: a central office (CO) module and an outside plant amplifier. The CO module provides the power, system health check and administration of the external equipment. The outside plant amplifier provides the extension of high-bandwidth services.

While there may be concerns about loop extenders and remotely deployed xDSL services interfering with existing services, several studies have been done based on the Alliance of Telecommunications Industry Solutions (ATIS), Standards Committee T-1 Telecommunications, contribution T1E1.4/2001-087. These tests showed that products like the GoLong loop extenders can be deployed and not disturb existing services. They do not add unacceptable noise on the line. The services that were not inhibited by interference include long-loop, narrowband services like POTS, and IDSL. This issue will continue to be studied by interested service providers and equipment manufacturers.

Far-Out

Demand for broadband and its revenue potential is growing each day. Major carriers have invested billions of dollars toward a goal to be the dominant suppliers of these services. Yet, even Project Pronto, an initial $6 billion program from SBC that planned to move broadband closer to their customer, has changed.

What's more, broadband over cable already has approximately twice the market penetration of DSL, according to Kinetic Strategies Inc. While the growth rate of DSL (up 382% in the U.S. to <2.4 million lines in service at year end, according to Telechoice Inc.) is currently higher than that of cable, cable companies continue to report strong increases in cable modem installations.

In order to be leaders in this potentially profitable market, DSL-based telecom carriers need to respond quickly to demand and provide broadband services where and when they are requested by customers. The strategies discussed here are those options that exist today to solve the distance limitations of xDSL. ■

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