

Multilink IP: A Compelling Business Proposition for Service Providers

Introduction

Service Providers face major obstacles in their efforts to deliver high bandwidth to customers, who have access to an increasingly competitive marketplace. Service providers must address:-

- Bandwidth requirements - delivering on customer expectations for fast, reliable, affordable bandwidth
- Management overheads and provisioning complexities
- POP constraints caused by a rapidly increasing customer base

The 2344 and ML-IP Concentrator provide a compelling business proposition for any service provider. Together, they enable service providers to deliver highly differentiated broadband services to business customers for a fraction of the cost and complexity of any alternative solution.

Present Alternatives for High Bandwidth Connections

If a single connection at T1/E1 speed is not sufficient to satisfy the bandwidth requirements, ready solutions are not always available. Upgrading the link to higher speeds is the most obvious solution, but often not possible since next level in the digital transmission hierarchy is at 45 Mbps (T3) or 34 Mbps (E3) link speeds.

Solutions that allow the use of parallel T1 or E1 links to provide NxT1 or NxE1 worth of bandwidth are approaches that scale well and can be economical as links can be added as the bandwidth requirements grow. Because there are no standards for NxT1/E1 connections, and separate T1/E1 lines, even those that connect the same two sites, are not synchronous to each other, NxT1/E1 solutions have typically been complex. Key parameters of the various solutions are how well they handle differential delay, the difference in time it takes a packet to traverse one link in the bundle versus another, link efficiency, how much of the NxT1/E1 bandwidth is actually usable for sending traffic, and manageability, how the system handles individual T1/E1 line failures.

The main advantages of an ML-IP based broadband solution include:

- Expanded revenue base with greater reach
- Lower installation and maintenance overheads
- Higher customer retention
- Faster return on investment

ML-IP Extends Customer Reach

Previously existing technologies are based around T-1/E-1 leased lines. These connections are either unavailable or uneconomical to a broad range of customers. This has severely limited the market reach available to service providers.

ML-IP eliminates this problem, making the full spectrum of businesses potential customers for ISPs. This is made possible because ML-IP is access network agnostic. It works transparently over dial-up, DSL, cable and leased/private lines.

Service providers are increasingly onselling telco access services to customers. Although this provides a low risk business opportunity to service providers, there has been little opportunity to add value to these services. This is especially the case with DSL. ML-IP enables service providers to differentiate by offering high bandwidth high reliability services to customers, with little infrastructure cost, and low management and complexity.

ML-IP Simplifies Deployment and Management

Service providers are stretched by the increasingly large number of customer connections terminating at a single POP. A typical POP may terminate thousands of connections, ranging from 64Kbits/sec through to T-3. This is exacerbated by a one to one relationship between router ports and customers. Increasing bandwidth at each customer by increasing the number of router ports only accelerates POP congestion.

POPs contain a complex array of equipment that provides connectivity between the backbone, the internal network and connections to customer sites. Service providers are required to provide access over dial-up, xDSL, cable, and dedicated or leased lines.

ML-IP comprehensively addresses these challenges in the following manner:

- There is no one-on-one logical correspondence between a customer's broadband ports and the ML-IP Concentrator (at service provider). This allows a many-to-one relationship between the customer and the ISP. Furthermore, ports at the POP do not need to be dedicated to ML-IP connections but can be used for any broadband connectio, unlike alternative multilink solutions.
- Because ML-IP works at the IP layer, the service provider does not need to support any specific network access infrastructure. eg T-1 switch, DSLAM etc. This allows ML-IP services to operate over dial-up, leased lines, DSL and cable transparently
- The 2344 is a simple CPE ML-IP gateway with trivial setup requirements. The ML-IP Concentrator is a PC-based solution that requires a 100 M Bit/sec Ethernet interface, which terminates fragments from ML-IP, bonded connections and forwards aggregate packets to the Internet backbone router.

ML-IP: A Revenue Opportunity

Alternatives based around N x T-1 and channelized T-3 cannot address the bandwidth chasm, cost differential and service coverage challenges that exist.

ML-IP enables service providers to offer services that build on N x any access solution, bridging the bandwidth gaps in telco access products. For example, providers can create 5 Megabit/sec, 10 Megabit/sec and 20 Megabit/sec broadband access services based around ePipe's CPE ML-IP gateways (complete ePipe 2344 gateways or custom Linux appliances) and high-end Linux servers as ML-IP concentrators.

These solutions provide high bandwidth that was previously only available over fibre which was restricted to a metropolitan area. They also provide increased reliability with link fail-back and fail-over to multiple dial backup links.

Providers' investment in infrastructure compared with IMUX, ML-PPP, ML-FR or load-balancing equipment is miniscule. For example:

- N x T-1 solutions can be up to 10 times the cost of solutions based on ML-IP
- One ML-IP Concentrator can terminate up to 100 subscribers (each subscriber with 4 broadband links)
- Service Providers are not locked into a single access technology solution, reaching more customers

Given that the majority of ISP revenue is generated from business, and business use of the Internet continues to expand rapidly, ML-IP represents a compelling opportunity for service providers to market reliable and higher speed broadband access services whether they are a broadband provider or not.

ML-IP is simple to understand, easy to deploy and can be up and running very quickly, delivering strong revenue and satisfied customers in a short timeframe. Contact us for more information on how ePipe can help you identify how ML-IP can expand your business. Service providers automatically qualify to participate in our ML-IP evaluation program.

See also: [Using ML-IP Concentrator Software to Create ML-IP Broadband CPE Appliances \(96KB PDF Application Note\)](#).