METRO Ethernet Forum

Metro Ethernet Services For Enterprises

Business Case White Paper

October 2002

Target Audience

The target audience for this white paper is Enterprise executives looking for a business case understanding of Ethernet data networks vs. traditional Private Line or Frame Relay networks. This white paper is a condensed executive version of the 25-page Enterprise business case available through the Metro Ethernet Forum.

Executive Summary

After 25 years, Ethernet has become the ubiquitous Enterprise LAN technology with over 90% of all data traffic terminating on an Ethernet port. The inherent benefits of simplicity, flexibility and low cost have made Ethernet the natural technology choice for evolution beyond the LAN and into the metro network.

Connectivity services such as Ethernet Private LAN and Ethernet Virtual Private Line along with application services such as Ethernet Internet Access have emerged to leverage the advantages of Ethernet to deliver the following benefits into the Metro:

- **Flexible service scalability**
- **Economical scalability**
- **Lower operational costs**
- **Faster service delivery**

As demonstrated in this white paper, these Metro Ethernet benefits can potentially deliver up to 70% savings over traditional Internet Access and Private Line service alternatives. This business case is just one US-based example of how Ethernet Private Line services can be priced to deliver more cost-effective networking.

For the sake of brevity, significant details that are available in the full MEF business case have been summarized in this white paper. Please contact the MEF or one of its member companies for a copy of the more detailed business case analysis.

Introduction

Economic and business requirements are forcing enterprises of all sizes to re-evaluate their current IT networks. In the last decade, broad estimates state that LAN capacity has increased 100 fold and backbone networks have averaged a 300-fold increase in capacity. However, metro networks have seen only a 16 fold increase creating a significant traffic bottleneck in the metro. Only recently has it become economically and technically feasible for the ubiquitous Ethernet to be seamlessly transported across the readily available optical backbones of service providers.

One area where this is especially evident is in the metro area, where data services such as Private Line networking (using T1s or Frame Relay PVCs), Internet access, and legacy Transparent LAN are falling short of enterprise requirements for flexible and economic scalability.

To demonstrate the economic advantages of Ethernet-based services, a business case was completed quantifying the annual metro data service cost savings generated by Ethernet-based Internet Access and Private Line services as compared to similar services over traditional networks. Using a 5-site enterprise metro area as an example, the case study revealed a potential 70% savings over 3 years on these specific data services generally focused on Internet access.

Metro Ethernet Services: Resolving the Metro Challenge

Ethernet's compelling value proposition for enterprise customers combined with its adaptability to run equally well over both native Ethernet on fiber or SONET transport infrastructures, has convinced service providers of all types to introduce high-value metro Ethernet services to complement their service offerings. These **services typically include:**

- **Ethernet Virtual Private Line Services:** This connectivity service is an alternative to present private line and Frame Relay services, Metro Ethernet Private Line services provide the same dedicated bandwidth and unparalleled security but over a simple Ethernet interface.
- **Ethernet Private LAN Services:** This connectivity service is similar to legacy Transparent LAN services. Ethernet Private LAN services provide LAN-to-LAN metro Ethernet connectivity over shared network resources.
- **Ethernet Internet Access Services:** This specific application service is an example of a turnkey dedicated Internet access service; Ethernet Internet Access provides an alternative to inflexible private line and Frame Relay methods.

Specifically, these services have significant benefits over traditional metro data services by providing the following benefits:

- **Flexible Service Scalability:** The flexibility of Ethernet enables service scalability from 1 Mbps to 1 Gbps in granular (e.g.: 1 Mbps) increments.
- **Economical Scalability:** Metro Ethernet services also provide far more economical service turn-up and scalability than traditional metro data services. Enterprises overall costs are immediately reduced with the elimination of substantial up-front capital outlay for expensive router or ATM access devices. Because these services are delivered over a simple Ethernet interface, these enterprises require only an Ethernet port on a low-cost layer 2/3 LAN switch.
- **Lower Support Costs:** Metro Ethernet services dramatically reduce enterprise engineering and operational support costs by eliminating much of the operational complexity associated with traditional metro data services. Because Metro Ethernet utilizes the same protocol, frame format, and frame size as familiar LAN Ethernet deployments, the need to maintain expensive, specialized IT staff versed in the configuration, management and maintenance of multiple protocols is reduced.
- **Faster Service Delivery:** With the flexibility of software-provisioned bandwidth-on-demand, capacity can change just as dynamically as business requirements. The impact allows enterprise IT managers to abandon expensive "just-in-case" capacity provisioning for "just-in-time" capacity provisioning.

Case Study: Quantification of Cost Savings

The case study analyzed the potential savings over a three-year period realized by metro Ethernet Private Line Data services over today's traditional options. For simplicity purposes of this case study, only monthly recurring charges (MRCs) are calculated—i.e. the additional savings from reduced hardware capitalization cost or installation cost are not included. It should also be noted that the study does not quantify the additional savings potentially generated by reduced engineering and operational support.

To quantify MRC savings, the case study modeled a representative metro area profile for a large nationwide enterprise. The modeled metro area consists of:

1 Large Site (500+ employees) and 4 Medium Sites (100-499 employees)

It is assumed that these sites require connectivity for two metro data applications: Dedicated Internet Access and Private Line over a three-year period. Per service bandwidth requirements from 3Mbps to 36 Mbps are detailed in the actual business case. Traditional and Ethernet service pricing is then applied to calculate total annual costs for comparing Ethernet services vs. traditional Private Line and Frame Relay.

Figures 1 and 2 below graphically summarize the business case results for monthly cost per total Mbps utilized for both traditional service networks and for Metro Ethernet Private Line services. The following cost model is based on averaged tariffs from various service providers in the US, available at the time of the study in April 2002.

Figure 1: Private Line Monthly Service Pricing

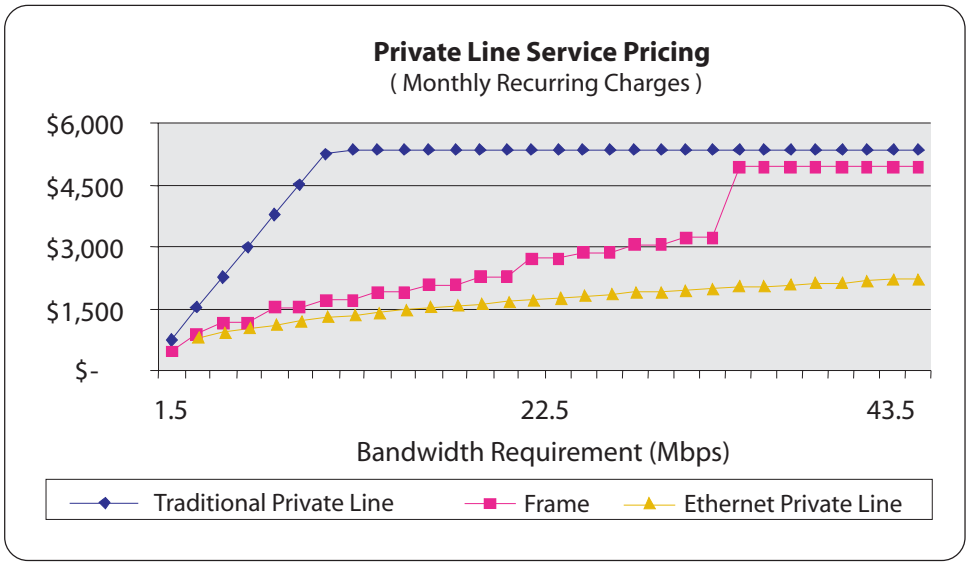
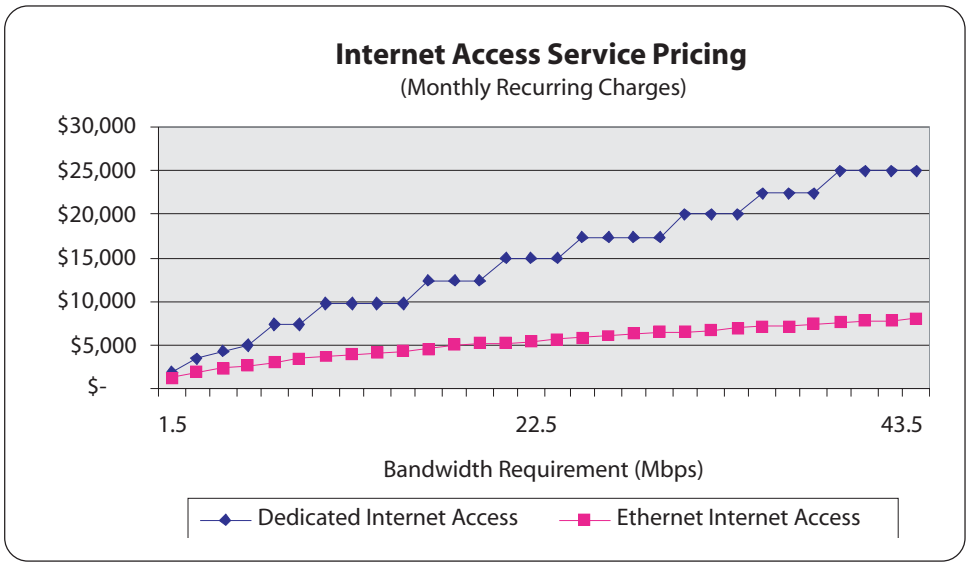


Figure 2: Internet Access Monthly Service Pricing



Cost Analysis: Results

The case study cost analysis results revealed significant savings generated by the metro Ethernet model over both traditional models for these very specific dedicated data services. The summarized dollar numbers provide additional insight into potential savings.

As shown in *Figure 3* and *Table 1* below, the $624,174 total cost for the Metro Ethernet model represents savings to the enterprise for the modeled metro area of over 70 percent versus both the private line and Frame Relay-based traditional models.

Figure 3: 3-Year Total Cost Savings

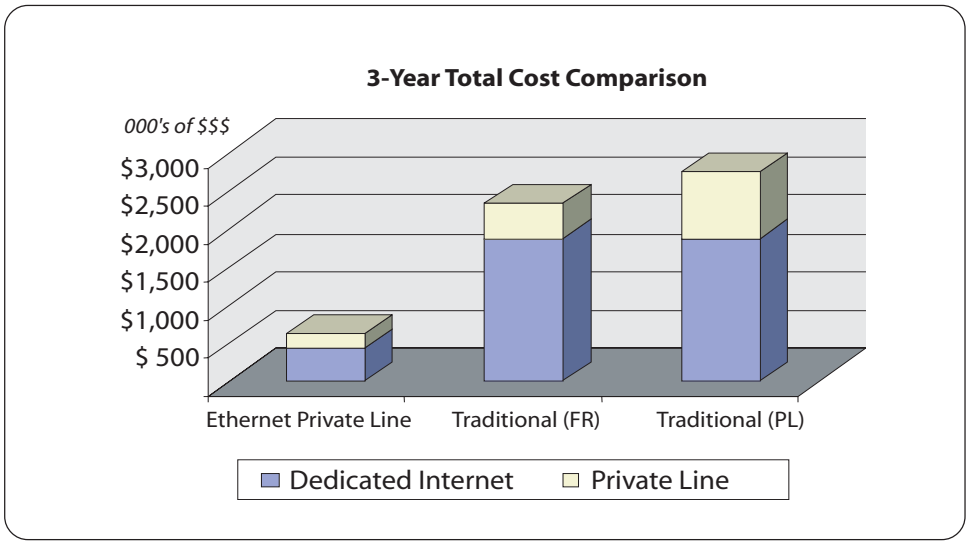


Table 1: 3-Year Total Savings

3-Year Total Savings	
% Savings over Traditional Metro (Frame Relay)	
$$$	$1,700,052
%	73%
Savings over Traditional Metro (Private Line)	
$$$	$2,129,481
%	77%

Significant calculation details are summarized here, but it is worth breaking out the figure 3 above to understand how Ethernet Internet Access is really the key driver for cost savings. Translating the total savings results to per service savings uncovers that Internet access is the primary drivers of these totals. The per service savings include:

- **$1,430,954 Ethernet Internet Access savings over traditional dedicated Internet access**
- **$269,098 Ethernet Private Line savings over Local Frame Relay**
- **$698,527 Ethernet Private Line savings over traditional Local Private Line**

Additional details behind these numbers revealed that the percentage of total savings were greater at the larger sites where bandwidth requirements are higher. This effectively illustrates that, while economically compelling at all bandwidth levels, the percentage of savings escalates as bandwidth increases. This can be directly attributed to the flexible scalability of metro Ethernet services. Unlike traditional services, Ethernet services allow Service Providers to provision expanding bandwidth requirements from 1 Mbps to 1 Gbps from a single port without changing-out interface cards or equipment, thereby driving cost per Mbps savings that widen in step with service bandwidth increases.

Conclusion

The business case illustrates how Metro Ethernet Private Line Services enable enterprises to consistently and cost-effectively meet the escalating demand for metro data capacity by providing the following strategic and economic advantages:

- **Flexible service scalability**
- **Economical service turn-up and scalability**
- **Lower engineering and operational support costs**
- **Faster service delivery**

As illustrated by the case study, these powerful benefits combine to provide the typical regional enterprise with three-year metro data service savings between $1.7 and $2.1 million, approximately 70 percent, over traditional private line and Frame Relay-based alternatives. Armed with this functional and economic justification, enterprise IT managers can now make informed decisions regarding future connectivity needs, and partner with service providers to evolve towards such Ethernet services.

References

MEF Enterprise Business Case 101: MEF Economic Business Case for Enterprises – Project 101 at: http://www.metroethernetforum.org/MEFBusinessCase101_FINAL.PDF

Acknowledgments

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About the Metro Ethernet Forum

The Metro Ethernet Forum (MEF) is a nonprofit organization dedicated to accelerating the adoption of optical Ethernet as the technology of choice in metro networks worldwide.

www.MetroEthernetForum.org

The Forum is comprised of leading service providers, major incumbent local exchange carriers, top network equipment vendors and other prominent networking companies that share an interest in metro Ethernet. As of August, 2002, the MEF has over 70 members.

