

## Evaluating Returns On An IP VPN Investment

### Supplemental Case Study: One Company's Results

#### Executive Summary

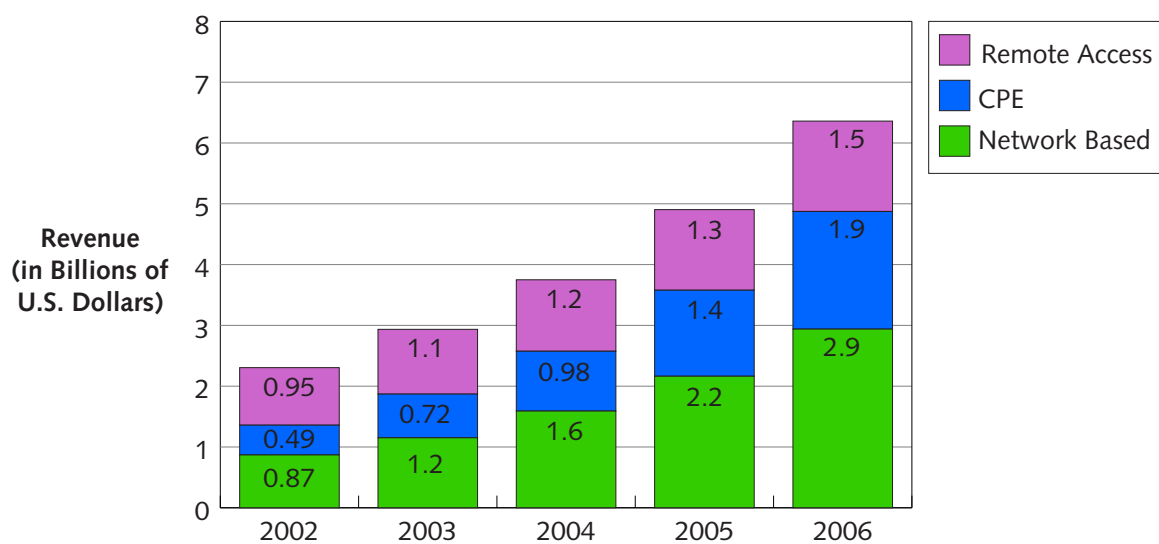
*IP VPNs continue to work their way deeper into the enterprise networking environment in numerous capacities. For several years they have been a slam-dunk for providing secure dial-up connectivity to mobile employees, broadband corporate LAN access to telecommuters, location disaster recovery and small branch office integration into the corporate WAN fold. Today and going forward, the Yankee Group sees a growing number of enterprises leveraging IP VPNs as a significant and, in some cases, primary component of their wide area site-to-site connectivity in lieu of frame relay and/or private lines. This trend will continue at an escalating pace.*

*At the same time, uncompromising economic forces in the IT/network manager world, including decreased budgets and the requirement to defend departmental ROI, are driving increased technology business case and return analyses. Further, for certain enterprises these economic challenges, combined with other intrinsic value propositions, continue to drive an increasing number of them toward various types of managed or outsourced solutions.*

*With such items in mind, this report will first briefly define and outline the growing types of IP VPN managed services (see Exhibit 1) in the market and then delve into the investment and return considerations of such offerings. It will conclude with a real-world case study showing the positive economic impact one company realized by shifting its infrastructure from a managed frame-relay service to a managed IP VPN service with Virtela Communications.*

#### Exhibit 1 North American IP VPN Services Market Forecast

Source: The Yankee Group, 2003



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## Table of Contents

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I. Managed IP VPN Services . . . . .	2
II. Investments and Returns . . . . .	4
III. Case Study: Multinational Law Firms . . . . .	7
IV. Conclusions . . . . .	12
V. Further Reading . . . . .	14

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### I. Managed IP VPN Services

In its truest definition, a virtual private network is a method to virtually access private information over a public or shared network infrastructure. Frame relay and ATM fall into this category, as do the public Internet and native IP services offered over private IP backbones. Our focus here will be on the latter—managed IP VPN solutions. Because of their flexibility, ubiquitous network footprint when incorporating the Internet, and convergent delivery of the growing number of IP-based applications, an increasing number of organizations are using IP VPNs.

#### CPE and Network-Based Delivery

CPE-based IP VPNs are the oldest and most widely deployed type of managed VPN service. The service provider configures, installs and manages access devices on the customer premises that create secure connections between corporate sites. The devices are configured with a tunneling protocol (IPsec) to create private tunnels or “virtual” routes over the Internet or a service provider’s backbone. The challenge to date with this kind of deployment is the increasing levels of complexity and hardware expense as the number of locations increases.

Network-based IP VPNs, on the other hand, are enabled at the service provider network edge rather than at the customer premises. Through either IPsec and/or MPLS across a service provider’s backbone, they offer all of the privacy of traditional data services (more so with IPsec and encryption) while offering features that only an IP-based service can bring. Specifically, they bring the ability to cost-effectively leverage meshed configurations for enhanced performance, as well as the option of layering on additional IP-centric solutions such as network-based security, IP video, IP voice or other features that bring additional value to the network.

Whereas CPE-based solutions have found a home in supporting smaller enterprise deployments, distributed remote locations and telecommuter environments, network-based IP VPNs are seen more as a next-generation frame relay (or ATM and leased line) replacement or augmentation. Like frame relay, however, network-based IP VPN solutions are not ubiquitously available or applicable for every potential connection in an enterprise network. Today and tomorrow, the world requires the cohesive flexibility that only a hybrid approach can deliver.

## A Hybrid Approach

The optimum solution for the enterprise is a service provider that offers both CPE and network-based IP VPN implementations for site-to-site connectivity as well as IPsec and SSL tunneling for remote access. Another key criterion in a service provider is a willingness to facilitate access connectivity via its own private network as well as leverage the connectivity and access technologies of other providers—or existing enterprise access—for those locations that are not part of the network. Many legacy service providers are unwilling to assist in the deployment of service to locations where they are not the underlying carrier, but of course no service provider owns physical reach to all parts of the globe. Nor do many of these same providers support all of the various access technologies that an enterprise may be considering.

From an enterprise perspective the keys to networking are—or should be—performance, reliability and cost versus underlying fiber ownership. Virtela is one of the few providers that can provide this blended approach, offering the advantages of both the network-based and CPE-based systems in an access-agnostic fashion to provide the customer with a tailored and complete solution.

Based on an understanding of managed CPE-based, network-based and hybrid IP VPN services, an ideal physical configuration would be the following:

- Replacing the traditional frame-relay footprint of the enterprise with a service provider's network-based IP VPN offering. The configuration would be fully meshed to allow for optimum performance.
  - The Yankee Group sees a number of enterprises leveraging IP VPNs as a backup disaster-recovery solution running in parallel with a frame-relay network. Integration of the two, as well as the ability to leverage the bandwidth of each on a day-to-day basis, is key.
- Any site that is below a certain number of users, as defined by the enterprise, as well as telecommuters will connect via broadband using a CPE-based device to provide secure access to the corporate WAN.
- All locations, including remote/branch offices, will have direct local Internet connectivity as well as VPN connectivity to the corporate headquarters via a single access line.
- All locations belonging to the corporate domain will have a network-based firewall as part of the service, protecting the Internet connection and corporate resources.
- The service provider will facilitate the deployment of IP VPN services to extranet partners or any location not available over the carrier's footprint.

Such an implementation would give the corporation ubiquitous IP access among all corporate locations as well as chosen locations not in the corporate domain (extranet). The service provider should offer SLAs for the sites located on their footprint as well as any off-net and/or broadband locations so the enterprise will not notice any degradation in service. In fact, because of the fully meshed architecture, the likelihood of increased bandwidth with the new design and QoS capabilities available today, performance—in the vast majority of cases—will improve.

## II. Investments and Returns

For the vast majority of enterprises, an existing wide-area infrastructure exists against which any new alternative will and should be compared. While the focus and example here is on the economic comparison, enterprises are wise to look beyond the quantitative aspects of any new initiative and include the qualitative benefits in their analysis.

It should be noted that an enterprise can evaluate an entire set of cost and benefit considerations by comparing its own internal implementation and ongoing management of an IP VPN (do-it-yourself mode) to the cost of outsourcing much of this responsibility to a service provider. The purpose here is to identify the investments and associated benefits of a managed IP VPN service to that of a legacy solution such as frame relay.

In evaluating the costs and returns of an IP VPN service that a service provider manages for the enterprise, it is appropriate to segment the cost and return components into hard and soft impacts and, where appropriate, one-time and recurring costs (see Exhibits 2 and 3). Once it understands the total cost of ownership (TCO) of the proposition, the enterprise can fully comprehend the return on investment (ROI) of migrating to the service based on a comparison to its existing network cost structure.

### Exhibit 2 Key One-Time Costs

Source: *The Yankee Group, 2003*

- New Equipment: procurement-purchase, lease, etc., staging, redundancy
- Equipment Installation: staging and physical deployment
- Access/Local Loop Installation: to primary WAN, for backup, to the Internet
- Service Activation: a typical provider fee for setting up a particular location
- Parallel Networks: the cost of operating dual networks for 30 days during migration

### Exhibit 3 Key Recurring Costs

Source: *The Yankee Group, 2003*

- Premises Equipment Management
- Access/Local Loops
- Managed Ports/Connections (the bandwidth):
  - Site-to-site (domestic and international)
  - Inter-company or business-to-business
  - Internet access
- Remote Access User Connections (mobile, telecommuters, remote offices)
- Solution Redundancy (equipment, access, network ports)

## The Hard Costs and Returns

Obviously, with any telecommunications service or technology there are associated internal costs as well as fees paid to the service provider. An interesting note from enterprises already making the migration to an IP VPN service is that in the majority of cases an apples-to-apples comparison to the legacy solution is not clear-cut. The reason for that is many enterprises use the opportunity to add functionality (redundancy for disaster recovery, for example), additional bandwidth and to provide service to new locations.

### Measuring Returns:

Evaluating TCO investment returns should include analysis on a monthly as well as 3- to 5-year basis, including upfront one-time costs. Depending on the geographic scope of the endeavor, domestic and international analysis also may be appropriate. Indicators such as one-time charges, months to payback, percentage savings and dollar savings—both monthly and annually—all are important to measure in order to understand the underlying drivers.

The following is an example template for the comparison of hard costs, which is similar to what will be used in the real-world case study (see Exhibit 4).

## Exhibit 4 TCO/ROI Template

Source: The Yankee Group, 2003

### TOC/ROI Template

One-Time Charges	Managed Frame Relay	Managed IP VPN
Network Availability	X%	Y%
Equipment Fees		
- Equipment - Equipment Installation		
Local Access Installation		
- WAN Access Primary Backup - Direct Internet Access		
Service Activation		
- Managed Ports and PVCs - Direct Internet Access		
<b>Total One-Time Costs</b>		
Monthly Recurring Charges	Managed Frame Relay	Managed IP VPN
Network Availability	X%	Y%
Managed Equipment Fee		
- Domestic - International		
Local Access Charges		
- Domestic WAN Access Direct Internet Access - International WAN Access Direct Internet Access		
Managed Ports/PVCs Charges (Primary)		
- Domestic - International		
Secondary Connection/Backup Charges		
- Domestic - International		
Direct Internet Access Ports		
- Domestic - International		
Network Availability		
- Downtime per Month - Cost of Downtime per Month		
<b>Total Domestic Spend per Month</b>		
<b>Total International Spend per Month</b>		
<b>Total Combined Spend per Month</b>		
Total Costs and Returns	Managed Frame Relay	Managed IP VPN
<b>*Total 1-Year Cost</b>		
<b>*Total 3-Year Cost</b>		
<b>Percent Savings</b>	N/A	
<b>Months to Payback</b>	N/A	

Note: \*Includes one-time cost of CPE and downtime

## Business Benefits and Returns

As mentioned earlier, enterprises are wise to look beyond the quantitative aspects of any new initiative and include the qualitative benefits within their analysis. Although these items are very real in their impact on network staff and end users, typically it is difficult to assign them a hard dollar value to which all parties can agree. Of course this should not preclude an enterprise from doing so or at minimum identifying and highlighting these crucial items.

Exhibit 5 provides a sample list of likely “soft” benefits realized in migrating to a managed IP VPN service.

### Exhibit 5 Soft Benefits of a Managed IP VPN Service

Source: *The Yankee Group, 2003*

- Increase in Network Staff Efficiency/Productivity/Morale
- Increase in Employee Efficiency/Productivity
- Decrease in Network Downtime
- Direct Internet Access Resources per Site
- Performance Increase of Mesh Architecture and Potentially Increased Bandwidth
- Enabling New Application(s)
- Management and Operation of Converged Architectures
- Enhanced Flexibility to Add/Delete Users, Locations, Partners

## II. Case Study: Multinational Law Firm

As one of the largest corporate law firms in the world, The Firm (unnamed here and referred to as The Firm throughout the case study) has almost 1,000 lawyers serving clients across virtually all legal disciplines. The firm’s headquarters is in the eastern United States and it has offices throughout the United States, Europe and Asia in order to serve a global client base.

### The Firm’s Networking Situation

The Firm’s frame-relay service was unacceptable for an enterprise of its size and dependence upon electronic communications—13 domestic locations and 4 international. When frame-relay outages occurred, branch offices had no access to network resources, limiting the lawyers in the office to phone service only. According to The Firm’s network operations manager:

*“If the network isn’t available our lawyers can’t communicate with each other and more importantly with our clients. Downtime had become an unacceptable scenario for us. Internally guaranteeing 100 percent network availability—including international locations—wasn’t going to be feasible with frame relay.”*

Frustrated, The Firm began looking for an alternative network configuration that would deliver the uptime it required but, if possible, at the same or lower cost. Bandwidth requirements for The Firm also had increased sharply since deployment of its original network. The use of various high-bandwidth document-sharing applications and expanding leverage of the Internet for research by the lawyers in support of client casework required that the new solution also take The Firm to the next level of available bandwidth.

Of course the first thing the internal team thought of was broadband as a secondary—and in some instances primary—connection, depending upon bandwidth needs. However, introducing broadband internationally would require the provisioning coordination and then ongoing 24x7 management of multiple access providers. Both the short implementation timeline they were working under, as well as the already stretched state of internal resources, were cause for concern with a solution delivered and managed in house.

## Solution

The Firm was extremely interested in leveraging an IP VPN for its new wide-area infrastructure. The global nature of the network, bandwidth requirements and desire for a converged environment—among other considerations—pointed them in this direction. As a result, The Firm enlisted the services of Virtela Communications, a Denver-based firm offering global outsourced IP VPN solutions via a unique multi-backbone model that leverages network-based service delivery augmented by CPE-based configurations where appropriate. One of the things that the network operations manager and his team required of any service provider was a highly consultative approach that could be accomplished in a very short timeframe—a week:

*“We knew we had some very unique requirements that couldn’t be dealt with in a cookie-cutter manner. It was key that our account team came onsite for a couple of days to gather all the details, went and designed a solution as well as a supporting business case I could leverage, and then came back on site to present the design, findings and deployment plan.”*

Virtela network architects designed a tailored regional hub-and-spoke network leveraging a hybrid approach to implementing an IP VPN for The Firm. It provided secure, direct Internet access for all sites in the design, eliminating inefficient bandwidth backhaul to any hubs as with the previous frame-relay solution. In addition, Virtela incorporated triple redundancy with automatic failover—encompassing local access and routers—into the architecture in order to meet the extensive and demanding availability requirements.

A key component making the configuration possible was Virtela’s ability to provide The Firm with services enabled directly from its private network as well as via IPsec and SSL. This flexibility allows Virtela to leverage multiple Tier 1 partner access networks domestically and abroad. Whereas most IP VPN carriers are limited to their own network to fully manage and monitor a VPN solution, Virtela is accomplished in blending access networks from virtually anyone to provide a global—including broadband—solution that fits the individual requirements of an enterprise.

The core of the hybrid design leverages direct TDM connectivity to Virtela service PoPs for the primary links at major hubs/larger locations and broadband for smaller remote locations. Secondary TDM links at the larger locations are diversely routed via an access provider partner and then terminated to Virtela's PoP. This allows both links to take advantage of a fully meshed network-based IP VPN solution. The diverse connections also incorporate high-availability premises equipment for automatic failover in a load-balanced architecture. The Firm is therefore able to utilize the bandwidth of both connections versus one sitting idle in case of disaster. Smaller locations leverage broadband DSL in conjunction with a CPE-based solution incorporating IPsec for secure integration into the WAN. All the locations also are provisioned with ISDN BRI for secondary and/or tertiary back-up connectivity.

For mobile users and telecommuters, access to corporate resources is accomplished via either an IPsec software client and/or Virtela's network-based SSL solution. Network-based SSL eliminates the need for The Firm's IT staff and individual users to maintain up-to-date client software on their machines. Further, it enables traveling users to access corporate resources from Internet-connected machines other than their own (e.g., kiosks, client PCs, etc.).

The network operations manager's initial reactions to the proposal was positive:

*"When I saw the Virtela design and the unique ways it addressed my key requirements I was impressed. At the same time however, I was concerned how such an architecture would fit into my budget."*

### The Bottom Line

Exhibit 6 provides a snapshot of The Firm's network highlights and the returns they have realized with migration.

#### Exhibit 6.

#### Returns Realized from Migrating to an IP VPN

Source: The Yankee Group, 2003

Network Highlights	Investment and Return Highlights
<ul style="list-style-type: none"> <li>• Tailored design leveraging hybrid IP VPN implementation spanning 13 domestic and 4 international locations</li> <li>• Triple redundancy (access and equipment) with automatic failover in load-balanced design...100% network availability</li> <li>• Network-based SSL for mobile user remote access</li> <li>• Secure, direct Internet access for every location</li> <li>• Minimum of twice the bandwidth of prior solution</li> </ul>	<ul style="list-style-type: none"> <li>• Months to payback on Virtela investment: 1.8</li> <li>• Monthly recurring charge savings: 36%</li> <li>• Total savings over 3 years: \$1.7 Million</li> <li>• Virtela IP VPN savings compared to equivalent frame-relay network:               <ul style="list-style-type: none"> <li>- Monthly recurring savings: 58%</li> <li>- Total savings over 3 years: \$4.5 million</li> </ul> </li> </ul>

## Digging Deeper

While The Firm knew going into this process that it had lofty goals for the network and that such goals typically dictated a large price tag, it could not accept a cost of ownership increase over the existing solution. The following is a side-by-side analysis of the investments and returns The Firm realized migrating from its managed frame relay network to Virtela's managed IP VPN service.

Of particular importance to note throughout this economic comparison is the realization that The Firm's existing solution did not incorporate disaster recovery/redundancy—going from an existing 98 to 100 percent availability—individual location direct Internet access or the increased bandwidth they now leverage. Virtela's solution has delivered on all of these fronts.

Where appropriate, cost estimates for adding “equal” functionality to the existing frame-relay network are provided for additional insight into the comparisons.

## One-Time Charges

Although The Firm had already outlaid the initial one-time dollars to implement the existing frame relay network, for apples-to-apples comparison purposes we present them here. In addition, one-time charges to add new, similar functionality as the IP VPN solution are estimated (numbers in italics) based on industry averages tracked by the Yankee Group (see Exhibit 7).

### Exhibit 7 Industry Averages of One-Time Costs

Source: The Yankee Group, 2003

One-Time Charges	Tier 1 Managed Frame Relay	Virtela Managed IP VPN
Network Availability	98%	100%
Equipment Fees		
- Equipment	\$28,000	Included
- Equipment Installation	\$5,850	Included
Local Access Installation		
- WAN Access		
Primary	\$12,900	\$9,400
Secondary	\$6,450	Included
ISDN	\$6,500	Included
- Internet Access	\$2,500	Included
Service Activation		
- Managed Ports and PVCs	\$2,800	Included
- Internet Access	\$2,800	Included
<b>Total One-Time Cost - Actual</b>	\$49,550	\$9,400
<b>Total One-Time Cost - Upgraded Frame</b>	\$67,800	\$9,400

## Monthly Recurring Charges

While the recurring charge comparison between the two solutions below highlights the IP VPN value proposition at face value, the details behind the new solution make it even more compelling. In addition to 36 percent actual monthly savings with the new implementation, The Firm has realized at least double the WAN bandwidth across its domestic and international locations in addition to direct access to the Internet for each site. Because of this, The Firm is enjoying decreased costs.

The performance of the solution is guaranteed beyond that of the previous frame-relay network through SLAs encompassing MTTR, throughput, latency, jitter and network availability at 100 percent. Increased direct site-to-site communications through meshing is improving The Firm's applications performance.

Further enhancing availability, the Virtela solution also incorporates load-balanced primary, secondary and tertiary diverse connectivity and equipment with automatic failover at less than the existing single network connection frame-relay solution (see Exhibit 8).

### Exhibit 8. IP VPN Monthly Recurring Charge Comparison

Source: *The Yankee Group, 2003*

Monthly Recurring Charges	Tier 1 Managed Frame Relay	Virtela Managed IP VPN
Network Availability	98%	100%
Managed Equipment Fee	None	
- Domestic	\$2,300	Included
- International	\$750	Included
Local Access Charges		
- Domestic		
WAN Access	Included	Included
Internet Access	<i>Included</i>	Included
- International		
WAN Access	Included	Included
Internet Access	<i>Included</i>	Included
Managed Ports/PVCs Charges (Primary)		
- Domestic	\$46,783	\$18,220
- International	\$15,000	\$6,850
Secondary Connection/Backup Charges	None	None
- Domestic	\$23,392	\$17,200
- International (One Location)	\$2,500	\$1,420
Tertiary Connection/Backup Charges (ISDN)	None	
- Domestic	\$3,250	\$1,260
- International	N/A	N/A
Internet Access Ports	None	
- Domestic	\$3,500	Included
- International	\$1,500	Included
Network Availability	99.98%	100%
- Cost of Downtime per Month	\$5,500	\$0
<b>Total Domestic Spend per Month - Actual</b>	\$49,533	\$36,680
<b>Total International Spend per Month - Actual</b>	\$17,750	\$8,270
<b>Total Domestic Spend per Month - Upgraded Frame</b>	\$81,975	\$36,680
<b>Total International Spend per Month - Upgraded Frame</b>	\$22,500	\$8,270
<b>Total Combined Spend per Month - Actual</b>	\$67,283	\$44,950
<b>Total Combined Spend per Month - Upgraded</b>	\$104,475	\$44,950

## Total Costs and Returns

The numbers speak for themselves, from The Firm's perspective. Monthly savings of 36 percent or \$1.7 million over three years in comparison to the existing managed frame-relay service. Even greater savings if you consider the increased costs of a comparable frame-relay design versus the actual existing network (see Exhibit 9).

### Exhibit 9 IP VPN Managed Service Comparison

Source: *The Yankee Group, 2003*

Total Costs and Returns	Tier 1 Managed Frame Relay	Virtela Managed IP VPN
<b>Actual</b>		
*Total 1 Year Cost	\$856,946	\$548,800
*Total 3 Year Cost	\$4,993,026	\$3,264,600
<b>Percent Savings</b>	N/A	36%
<b>Months to Payback</b>	N/A	1.8
<b>Upgraded Frame Relay</b>		
*Total 1 Year Cost	\$1,321,494	\$548,800
*Total 3 Year Cost	\$7,725,564	\$3,264,600
<b>Percent Savings</b>	N/A	58%
<b>Months to Payback</b>	N/A	0.7

Note: \*Includes one-time cost of CPE and downtime

It is important to point out that in addition to the impressive hard cost savings The Firm realized, it also was able to realize the following “soft” benefits—more difficult to put a price on—but equally important to The Firm's business:

- Increased productivity/efficiency of IT/network staff on initiatives vital to the business
- Increased productivity/efficiency among the firms lawyers
- Greater customer interaction and satisfaction
- Flexibility to evolve the network as The Firm grows

The network operations manager summed up the results:

*“In addition to bottom-line cost savings, the 24x7 support and rock-solid network performance has allowed all of us on the IT staff to spend our time further enabling the business rather than monitoring and maintaining the network.”*

## IV. Conclusions

The preferred managed IP VPN vendor is a service provider focused on the optimum solution for the enterprise and its internal as well as extended connectivity needs (telecommuters, partners, suppliers, mobile users, etc.). To accomplish that optimum solution will require, in all likelihood, a hybrid approach. It also significantly benefits the enterprise if the service provider is willing to facilitate and manage the access connectivity and technologies of other access providers. The result is greater reach and technology choice for the users.

As was shown with The Firm and its provider, Virtela Communications, the business case for such an architecture can deliver very attractive bottom-line returns in addition to the benefits from a business-enabling perspective. The Yankee Group believes that the same will hold true for a significant number of enterprises that consider the approach.

Because the value propositions of the various IP VPN services that providers offer can be quite different and even confusing from a product standpoint, the Yankee Group makes the following recommendations to enterprises:

- **Become an educated buyer.** If network-based IP VPNs—or any service offering for that matter—are a new endeavor for you, make sure your service provider explains the different service offerings in familiar terms and spells out how they affect your business. Virtela, for example, takes a consultative approach to customer networks and designs a topology, business case and implementation strategy for each customer.
- **Continually reevaluate all vendor relationships.** Consider the following questions when conducting these evaluations: What is the financial status of my service provider/equipment vendor? Is my sales team top notch and the same team as it was two years ago? If not, what is the new relationship like? Does the service provider/equipment vendor have a strong vision for the future? What is its roadmap for IP services? How does this roadmap align with and help my business?
- **Have a contingency plan to minimize risk.** There are many good IP VPN offerings from non-legacy service providers available. If choosing one of these service providers seems risky, consider a configuration similar to that of The Firm, where Virtela was able to provide redundant IP connectivity and ISDN backup. This will enable your enterprise to take advantage of the advanced offerings from newer service providers, while also providing additional peace of mind. Virtela's solutions are access carrier-agnostic and traverse a multi-private IP backbone infrastructure, providing for maximum flexibility and redundancy in today's turbulent times.

## V. Further Reading

*North American IP VPN Services: The 22 to Watch*, Yankee Group Report, Enterprise Computing and Networking, April 2002.

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