

## WHITE PAPER

# Managed Broadband VPNs: Advantages for Enterprise Networking

Sponsored by: **Virtela**

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## EXECUTIVE SUMMARY

Faced with pressure to improve end user services, accommodate new network-intensive applications and control costs, enterprise telecom managers need every edge they can find to run efficient wide area networks (WANs). Locations with traditional private line and frame relay circuits see performance deteriorate as traffic grows and applications are expanded. New WAN technologies such as MPLS are “overkill” for many small and remote office locations. Such problems are multiplied on the international stage. However, a cost effective solution exists with properly managed broadband-based (DSL, cable, etc.) VPNs.

Broadband delivers 2.0 MB or greater of always-on bandwidth. And, at up to 75% cost savings over frame relay or MPLS, the cost advantages are too great to ignore. Now is the time to investigate where your company can blend secured broadband access options into your WAN environment. The primary concern raised by many enterprises regarding broadband is performance. Some question how it can meet the stringent requirements of enterprise contracts? Look again.

Broadband services are available today with support and performance characteristics that are familiar to frame relay and private line users. These include: defined class of service levels, MTTR guarantees, 24 by 7 support, and SLAs. In addition, don't think of broadband as an either/or solution, rather it enables an access agnostic approach. This provides the flexibility to create an overall network solution that best suits application, location, and budget requirements.

There are pitfalls with broadband VPNs for today's network manager. Day-to-day operations and support are more time consuming and challenging than T1/E1-based methods. Inconsistencies in service offerings, implementation, delivery and availability make it virtually impossible to create one network through one provider. Going international magnifies this multi-carrier problem. Don't let this stop you. Read on to discover how:

- To identify the pitfalls of managing a broadband-based VPN solution with in-house resources;
- To achieve an end-to-end, high performance broadband solution through outsourcing with a managed service provider;
- One company, Virtela, is leading the delivery of managed broadband VPNs worldwide.

### Top 4 places to leverage broadband:

- 1) Primary connections for small/branch offices in lieu of MPLS**
- 2) Replace high cost/low speed frame relay and private lines**
- 3) Replace ISDN with always-on, fixed price service**
- 4) Diverse, economical back-up for frame relay and MPLS network locations**

## SITUATION OVERVIEW

All enterprises should be thinking about the role broadband can play in their network. Today, services that pass the test of business class requirements are available in many countries. It may not be applicable at every site and for every application, but you as a networking professional need to identify the places where broadband delivers value, or you are doing your company and users a disservice. In fact, IDC today works with many companies who have successfully deployed broadband-based VPNs. Manufacturing companies, high tech firms, financial companies, professional services, multinationals, and national retail chains are all benefiting from broadband VPNs today.

The core advantage of broadband is that it delivers the same bandwidth characteristics as traditional T1/E1 or ISDN offerings at a much lower cost. The issues of network availability, service quality, and transmission speed can all be solved using low cost broadband technology such as digital subscriber line (DSL), cable modem, etc.

Broadband also delivers a more versatile and scalable environment because it can be installed rapidly and in places un-reachable by other technologies such as MPLS. In many countries the lead time to procure a private line connection requires months of forward planning. Broadband can usually be installed in under 3 weeks, and can even be installed in places that leased line services can't reach.

Top applications where broadband delivers proven economic advantages and performance gains are:

- ☒ Primary small/branch office connectivity. Small offices need access to enterprise applications and information, but tools to manage multiple locations are costly and complicated. A managed broadband service simplifies the process, and delivers cost-effective access for small/branch offices.
- ☒ Up-speeding Leased Lines and Frame Relay. Where bandwidth availability is inadequate and traditional upgrade options are not cost effective, broadband is an attractive solution. Prices for broadband service are considerably less than a T1/E1 line. Bandwidth constraints are a familiar experience for many business sites which use leased line access at speeds of 56 kbps or 128 kbps – IDC research shows that 80% of frame relay ports are 56 kbps. It is a big price jump to up-speed 56 kbps frame ports to 384 kbps or 528 kbps.
- ☒ Replace ISDN. Many companies rely on ISDN for data connectivity between remote sites and the head office. With a usage-based pricing structure, ISDN users are reluctant to stay online because of cost, and don't receive e-mail until they connect. DSL provides an always-on connection at a fixed price, and users are alerted to e-mails as soon as they arrive.
- ☒ Back-up solution for Frame Relay and MPLS. Broadband is an attractive back-up solutions for T1/E1 connections. It delivers a back-up speed that is close to T1/E1 rates. It provides additional bandwidth over the T1/E1. And it uses entirely different equipment from the telephone company T1/E1 facility, so physical redundancy is assured.

**Broadband-based VPNs are extremely challenging to maintain and manage in-house:**

- Inconsistencies in service offerings and single source availability make it virtually impossible to create one network through one provider.

**This should not stop you:**

- Outsourcing the implementation and ongoing management of broadband VPN locations to a managed service provider is the right approach
- Virtela is a leading global provider for the delivery and management of broadband VPNs today.

## Challenges of Do It Yourself Broadband-based VPNs

The advantages of broadband VPNs don't come without special challenges. It is a given that you will have to buy from multiple providers in a do-it-yourself scenario and, the more global you are, the more your solution will depend on a hodge-podge of providers. There is no single last mile provider that owns facilities end-to-end for global broadband coverage. In addition, in any given country, there are multiple broadband suppliers, again with no single provider delivering thorough national coverage. In the US, for example, a company with multiple offices and locations may end up with 25 different underlying carriers providing the broadband connections.

Multi-provider management makes for a day to day operational nightmare! What are the problems in this scenario? We count at least 9:

1. Divergent contract terms. How are adjustments, credits, and SLA negotiation handled? How are billing disputes resolved? How are trouble ticketing and escalation procedures defined? What are cancellation liabilities? How do contract renewals occur? Automatic renewals may not be best approach.
2. Currency conversion issues. Payment in a single preferred currency across all sites may not be possible in multi-national networking. Hedging multiple currencies is not a typical resume item for network managers.
3. Language issues add further confusion to contracts and technical support. A typical global network environment may have 16 time zones, 12 languages and 50 plus local providers. Few enterprise have in-house resources to handle the language diversity of multi-country tech support help desks. Language line support can be expensive and difficult to arrange.
4. Multiple invoices. Invoice formats are inconsistent across providers and regions. Remittance payments must be processed for each bill with little chance for customer-defined remittance procedures. Some providers require wire transfers, some require credit cards, some want 1 years payment up front.
5. You will not get SLA's between different provider delivered locations. Every broadband provider has a different practice on managing and guaranteeing performance levels. SLA and performance quality varies from inconsistent to no SLAs.
6. Service offerings vary by type and support of CPE devices, and by traffic aggregation and contention ratios.
  - ❑ Device procurement responsibilities vary by country and provider. DSL modems and VPN devices may be bundled with the service or purchased separately. The role of installation technicians varies by provider; some require separate technicians for Internet access turn-up and for VPN installation.

**The biggest challenge with in-house deployed broadband is the requirement to purchase from multiple sources.**

**No single last mile provider offers broadband service across the various countries in which you may operate.**

**Furthermore, in every country there are multiple broadband providers with each having specific areas of coverage.**

**In-house delivered and managed broadband VPNs come with many challenges:**

- 1) Divergent contract terms
- 2) Currency conversion
- 3) Language problems
- 4) Multiple invoices
- 5) Lack of end-to-end SLAs
- 6) Inconsistent service offerings
- 7) Unpredictable routing
- 8) Lack of operational support
- 9) *Country idiosyncracies*

- ❑ Broadband and VPN functions may be packaged in one device for some providers, others may require two devices. CPE requires maintenance procedures specifying response times for phone support, part replacement, on-site support and definitions of "fault."
  - ❑ Business style broadband connections range from 1:1 to 40:1 over-subscription or contention ratios. Contention measurements can vary from provider to provider.
7. Routing and peering configurations create wide, unpredictable swings in performance. For business applications sensitive to latency and packet loss such as Citrix terminal services or VOIP, the traffic hand-off policy is critical. Most broadband providers simply hand-off traffic at the nearest peering point and no longer concern themselves with transiting packets. This triggers several risks for enterprise networks:
- ❑ It is critical to know how providers interconnect and route traffic - the shortest path is not always the best path. Inter-provider connectivity is a sophisticated management challenge; unaddressed, it can be a point of performance degradation. For example, it is not uncommon for traffic going from Thailand to Malaysia to go through the U.S. first. Obviously setting up private interconnects to improve local web browsing and speed application transit times cannot be justified by a single user organization.
  - ❑ You have no relationship with the providers in between (all the upstream providers involved) so nobody has end-to-end ownership for trouble resolution or performance.
  - ❑ Many international providers rely on a single peering point. You do not want to depend solely on a single congested peering point between two providers/countries
8. Broadband is not as mature a technology as T1/E1 with established help desk and technology familiarity. It requires special focus and resources, creating challenges for do-it-yourself approaches. Few enterprises have local staff who understand local technology idiosyncrasies. Whiel some break/fix events can be handled via remote diagnostics, it is inevitable that problems occur requiring dispatch and escalation management either through third party "hands-and-eyes," or you.
9. Country-specific idiosyncrasies. In countries such as China and Saudi Arabia, outbound connections are limited to only government approved providers, which may complicate routing and affect performance predictability. Route-arounds may exist on selected links, if you know where to look. Traffic compression may be an attractive option given bandwidth costs in certain countries. However, performance may be affected on compressed links leaving the country.
- ❑ The project management costs associated with VPN-specific equipment configuration, shipping, installing and trouble-shooting can also be challenging on a global scale. Conformance to customs treatment of international technology shipments and regulatory issues are necessary skills.

## Need for Managed Broadband VPN Services

Broadband-based VPNs create so many problems that the average enterprise network manager says - it isn't worth it. The day-to-day operational headaches wipe out the economic and performance advantages. But there is an answer; managed service offerings make this a practical solution today.

Managed service providers such as Virtela, solve the problems previously mentioned. However, not all managed service providers are created equal. To determine if a particular service provider is capable of delivering, you want to ask the following 7 questions:

1. **Seamless Reach.** Can they go where you need to go? Just because one provider cannot reach a certain geography, doesn't mean broadband is not available in that city/country from someone else.
2. **Performance backed-up by end-to-end SLAs.** Is your service provider simply delivering Internet access via broadband, or do they take ownership of your traffic from origination to termination? Does your service provider have the tools to gain visibility and control over all routes transited by that traffic?
3. **Proactive managed solution.** Does your service provider monitor not just circuit up/down, but also performance degradation, baseline changes, etc?
4. **Performance reporting.** Can your service provider deliver historical and real time performance reporting globally regardless of underlying access provider?
5. **Billing.** Can your service provider aggregate and integrate billing into a single currency that is preferred by your company?
6. **Local support.** What resources and procedures does your service provider have for installation, 4 hour MTTR on hardware, language capabilities, 24 x 7 x 365 help desk?
7. **Local experience.** What countries your service provider delivering in today and where do they have experience with multiple local service providers, tariff structures, government regulations, etc.

What you want in a managed broadband VPN solution provider is:

- A focus on and experience in delivering enterprise-class broadband-based solutions. There are many providers offering broadband to the consumer and SMB markets, however, there is a significant difference in the offerings and capabilities of these providers and those focused on the enterprise.
- A single point of contact for contracting, ordering, billing, maintenance and customer support for broadband access across all sites on a VPN. The key for this factor is the coverage map and span of access service provider partnerships.

**Managed service providers such as Virtela, solve the problems of broadband if they can deliver:**

1. **Seamless Reach.**
2. **SLA-backed Performance.**
3. **Proactive managed solution.**
4. **Performance reporting.**
5. **User-flexible billing.**
6. **Local support.**
7. **Local experience.**

**A good managed broadband VPN provider offers:**

1. **An enterprise-class broadband focus**
2. **Single point of contact**
3. **Centralized equipment management**
4. **End-to-end performance management**
5. **Single worldwide pricing**
6. **Project management**

- ☒ Centralized equipment management that performs configuration creation, distribution, activation, asset tracking and comprehensive break/fix. The key factor for this is project management expertise that has familiarity with the multi-domestic landscape.
- ☒ End-to-end performance management via investment in people, processes and tools justified on scale advantages achieved by sharing the cost across many user organizations. The key factor for this is proactive management that monitors not only the access loops but the full end-to-end transit. This delivers broadband with all of the responsiveness and customer support associated with leased lines.
- ☒ A single cost-effective worldwide price that is based on bulk buying power and ongoing renegotiation programs to improve contractual conditions with access providers
- ☒ Project management to meet the end-to-end tailored requirements of a user organization

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### **The Virtela Business Model**

Virtela has a business model that is well suited to the delivery of managed broadband VPN nationwide throughout the U.S. as well as on a very global scale. Unique to Virtela is its ability to pick and choose between any access vendor and any technology available in an area. Its advantage therefore is flexibility and choice. It offers the most extensive global broadband connectivity available—currently 125 plus countries—leveraging relationships with more than 250 access providers worldwide. Using other technologies such as MPLS and IP VPNs Virtela can further deliver to more than 190 countries.

As a managed service provider, Virtela provides one point of contact for global broadband ordering, provisioning, 24x7 operations center support, equipment, aggregated billing and currency conversion, and customer care. In addition, web-based tools include monitoring and reporting capabilities that enable you to view the real-time and historical performance of all your broadband connections.

Virtela's strength is in providing broadband VPN access as a managed service within a premium delivery model. A solution designed for those who value circuit up time, single-source global delivery, security, and proactive 24x7 support. Virtela very much views its customers as partners, working closely with enterprise network technical teams all the way up to the CIO. This includes items ranging from policy definition and support procedures to future business requirements planning and the potential impact to the Virtela provided infrastructure.

Further, Virtela has the inherent advantage of being viewed as a partner, rather than competitor, to the local access providers around the world—in essence viewed as an agnostic sales channel bringing them business versus building its own facilities to compete for the last mile. This proves a positive for the enterprise in the form of better SLAs and support intervals through Virtela delivered service.

### **Virtela Highlights:**

- ☒ Single Source Reach – Virtela covers more than 125 countries leveraging a huge database of access availability options, performance metrics and cost derived from relationships with 250 network providers. Many of these are 3 or 4 deep per country insuring a wide selection of technology choice to meet customers' specialized needs and to design a solution leverage best-of-breed city-by-city and country-by-country. Last but not least, all services are contracted for and invoiced in a consolidated manner directly with Virtela.
- ☒ Performance – Virtela uses a multi-carrier model based on regional policy centers interconnected to multiple tier 1 networks. Management is automated to insure dynamic best-path routing and default automatic failover between networks. This directs traffic between the locations via best performing paths
- ☒ Proactive Monitoring and Operations 24x7– Virtela delivers a single source solution from initial design; to configuration and global onsite installation of equipment; to ongoing monitoring, maintenance and support. Virtela does this from two operations centers in Denver, CO and Mumbai, India. Unlike many of the provider offerings in the market today that are very much reactive in support and troubleshooting, Virtela managed broadband solutions are proactively monitored—just like a frame relay or MPLS location. Broadband sites are tracked within its systems and by personnel so that any service degradation and/or alarm notifications are immediately recognized and action is taken.
- ☒ Flexibility and customizable designs for Managed Broadband VPNs – Utilizing proven methodologies worldwide and an agnostic business model foundation encompassing the last mile, backbone and vendor equipment, Virtela ensures its customers of an unbiased, vendor-neutral, customer-first solution.

## **SUMMARY & CONCLUSION**

Broadband services are available today worldwide that pass the test of business class requirements, and they are getting better.

Broadband is a flexible and cost-effective access alternative for up-speeding bandwidth constrained leased lines and frame relay, diverse and economical back-up to frame relay and MPLS network locations, primary connectivity for small/branch office locations, and to replace usage-based ISDN connections.

While broadband Internet access for a single location is relatively easy to deploy, broadband VPNs are much more challenging due to complications of equipment maintenance, technology diversity, handling multiple access provider contracts, solving security threats, and inter-working broadband with other access technologies.

The challenges of constructing a broadband-based VPN are being addressed by managed services offerings.

Virtela offers a managed broadband VPN that makes broadband a business class solution, delivers industry-leading geographic coverage, and comes with best-in-class security and flexibility.

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