



**SHAW VIRTUAL
PRIVATE LAN
SERVICE**

SHAW) BUSINESS SOLUTIONS

PRIORITIZE YOUR NETWORK WITH SHAW BUSINESS SOLUTIONS

In the highly competitive global business environment, CIOs are constantly searching for cutting-edge technologies to increase operational efficiency and reduce costs. Shaw Business Solutions relies on MPLS and VPLS technologies to offer non-stop, feature-rich business-critical services that will enhance business operations and enable you to meet your IT goals. Our comprehensive, converged solutions also enable enterprises to simplify financial accounting for services by reducing the number of individual service budgets. Furthermore, we understand that service interruptions are costly and disruptive, so our solutions are built on a highly reliable and scalable MPLS-based network infrastructure, to support your business-critical applications. Investing in these enhanced communications solutions from Shaw Business Solutions will enable you to maintain solid relationships with your customers and grow your business.

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INTRODUCTION

To address the enterprise's need for business-critical solutions support, Shaw Business Solutions offers Virtual Private LAN Service (VPLS). VPLS is an Ethernet-based service that is implemented on a highly reliable next-generation multiprotocol label switched (MPLS) network. MPLS routes traffic across a private IP network based on packet labels containing destination information and prioritization requirements. Given its flexibility and maturity, MPLS is the best method for delivering predictable quality-of-service (QoS) levels for network services. MPLS also simplifies the construction of flexible and cost-effective multipoint networks.

To take advantage of these distinct technical advantages, Shaw Communications has deployed a hierarchical national MPLS network based on the Alcatel-Lucent 7750 / 7450 Service Routing infrastructure. This network provides the foundation for delivering Shaw's converged services to customers across Canada. These services include residential voice and Internet, business voice and Internet, business data, and video-on-demand services, all delivered with the necessary prioritization to ensure a superior quality-of-experience for our customers. The ability of our MPLS network to provide enhanced QoS support allows Shaw to confidently offer world class network services to our entire customer base.

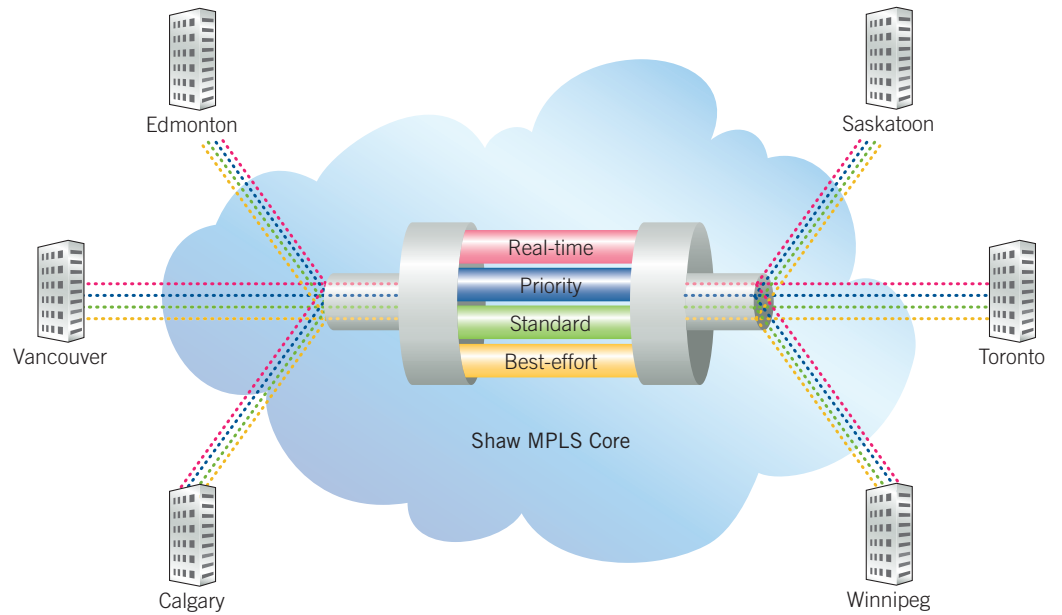
For our business customers, our VPLS solution, which is available in major metro markets and as an inter-city service, meets and exceeds the stringent demands of a variety of business objectives, including cost reduction, control of the network, network convergence, QoS and flexible multipoint connectivity. We understand that to maintain your competitive edge, you need IT applications that are specifically geared to your unique situation. And we all know that enterprises that leverage business-critical applications increase their efficiency and reduce the potential for business failure.

As a decision maker, when you are selecting a business services, you are looking for affordability, reliability, control and flexibility. In making your decision you will consider many service requirements including:

- › **Layer 2 networking, to allow for application protocol transparency**
- › **Your enterprise's need to control network routing across the Wide Area Network (WAN)**
- › **The ability to integrate all services over a common access technology**
- › **The option to connect sites using different access technologies**
- › **The ability to monitor the performance of the service**
- › **The need to minimize the time required to provision new services and bandwidth adjustments**
- › **How simple it is to deploy new business applications**

The VPLS solution from Shaw Business Solutions meets these requirements. Our VPLS solution is delivered over Shaw's highly reliable MPLS fibre-optic network, which has been built using industry-leading Alcatel-Lucent Service Routing products. Shaw recognized the need in the enterprise marketplace for a next-generation networking solution, and we designed our VPLS solution with these requirements in mind.

Figure 1: Shaw MPLS network architecture: enabling highly reliable and scalable VPLS-based business services



VIRTUAL PRIVATE LAN SERVICES

Shaw's MPLS network interconnects multiple metro areas across Canada. This network enables Shaw Business Solutions to offer a highly reliable VPLS solution to deliver flexible and reliable data networking services. VPLS supports the business-critical networking requirements of enterprise customers and offers many service advantages, including:

- **Easy, scalable bandwidth that can be quickly upgraded, up to Gigabit level**
- **Support for multiple services from a single user-network interface (UNI port)**
- **Multiple QoS/class of service (CoS) levels with locally-significant VLAN tagging, to account for voice, video and data applications, and to allow for more efficient bandwidth utilization**
- **A Layer 2 UNI, to eliminate the need for expensive WAN interfaces and to allow for application protocol transparency**

Historically, enterprises have looked to Frame Relay, ATM and private line services for their WAN needs. In each of these cases, building multipoint connections between corporate locations can be complex and expensive, given the inherent point-to-point nature of these services. Leveraging MPLS and the Layer 2 cloud nature of a VPLS instance overcomes these limitations to allow enterprises to build highly flexible and cost-effective multipoint networks, with QoS and high reliability.

Table 1. Comparing VPLS to other VPN technologies

Attributes	Frame Relay	VPLS	IP-VPN
Enterprise protocol	Multiprotocol	Multiprotocol	IP only
WAN connectivity topology	Point-to-point switched service	Multipoint bridged service	Multipoint routed service
SLA support per application type	Yes	Yes	Yes
Routing responsibility	Enterprise routes and provider switches	Enterprise routes and provider switches	Shared between enterprise and provider
Scalability when adding new sites	Point-to-point — scales well Multipoint — large mesh networks difficult to manage, cost-prohibitive	Multipoint — new sites need only local provider edge (PE) updates; lower cost (when compared with a meshed Frame Relay service)	Multipoint — new sites need all PE routing tables updated; lower cost (when compared with a meshed Frame Relay service)
Complexity of troubleshooting	Low	Low	Higher (due to routing complexity)
Protocol conversion between LAN and WAN	Required to go from LAN to Frame Relay	None	May be required to go from LAN to IP VPN
Native access circuit type	n x T1	T1/T3/Ethernet	Any
Service availability	Ubiquitous	Widespread	Widespread

THE VPLS ADVANTAGE

VPLS offers many advantages over legacy technologies. VPLS is topology-agnostic and equally efficient in supporting point-to-point, hub-and-spoke, and any-to-any requirements. With VPLS, you can avoid the high costs associated with building fully-meshed networks using Frame Relay, ATM or private lines, and change your topology over time as your needs evolve.

Other VPLS benefits include:

- **A transparent, protocol-independent LAN/WAN Ethernet service interface on your router, which reduces complexity and lowers the total cost of ownership**
- **Layer 2 protocol conversion is not required between LAN and WAN technologies, so you don't need to train IT personnel on technologies such as Frame Relay since there is no need to design, manage, configure and maintain separate WAN access equipment**
- **You have complete control over your routing table (which is not the case with IP VPNs), and there is a clear demarcation of functionality between your responsibility and Shaw's — which makes it easier, and therefore faster, to troubleshoot any problems. Since all your routers for your VPLS instance are part of the same subnet (LAN), your IP addressing plan is simplified, especially when compared to a mesh constructed from many separate point-to-point connections.**
- **Provisioning is faster, and in the future you will be able to provision bandwidth-on-demand for short-term, one-off changes to support special events on your own**
- **You have access to granular bandwidth increases up to 1 Gb/s, compared to Frame Relay's 'step-function' which requires increases in multiples of DS1/DS3**

By leveraging the availability and resiliency benefits of MPLS, VPLS ensures that you can make the transition from your current point-to-point services without compromising reliability. MPLS capabilities such as Fast Re-route can be augmented on a site-by-site basis with service diversity planning to ensure business continuity while containing costs. VPLS has all the security features you would expect from a carrier-class solution, including complete separation of one enterprise's traffic from another.

As an extremely flexible technology, VPLS is ideally suited for the dynamic enterprise environment. New sites can be added to the service without requiring any changes to existing sites. As a new site comes on line, it simply appears as a new presence on the enterprise LAN or VLAN. New services to support new applications can be added without disrupting existing services, which will continue to perform to their service guarantees. This removes the anxiety enterprises feel when introducing a new application, fearing the impact it might have on existing services. VPLS allows new applications to be put to use with confidence sooner rather than tying up that application investment in lab testing.

VPLS is implemented on a simplified, converged network infrastructure. This multiprotocol, multiservice infrastructure is ideal for today's enterprise network, which must support a range of voice, data and video functions while keeping costs low and minimizing complexity.

DELIVERING FLEXIBLE QUALITY OF SERVICE LEVELS

Our ability to deliver an enhanced and differentiated QoS to all our VPLS customers is an important differentiator for Shaw Business Solutions in the premium next-generation Ethernet service provider business space. Customers expect their traffic to be transported with a priority appropriate to its requirements, regardless of whether that traffic consists of voice, video, and high-priority data, regular customer traffic. Furthermore, they expect their service providers to accept, transport, and respect their delineation of their traffic. They expect to hand off marked traffic (for example, traffic with assigned DiffServ Code Point or class of service markings), and have that traffic transported across the cloud in a manner that respects their markings (within the limits of agreed-to service levels) and that allows their traffic markings to be transported transparently if possible.

Shaw Business Solutions supports four QoS levels for use by customer traffic:

- **Real-Time: Priority (EF) class – suitable for real-time voice/video, providing low latency and jitter**
- **Priority: Assured Forwarding (AF3) class – suitable for high priority data traffic**
- **Standard: Assured Forwarding (AF2) class – suitable for medium priority data traffic**
- **Best: Best Effort (BE) class – suitable for non-urgent traffic**

SHAW BUSINESS SOLUTIONS: YOUR PARTNER FOR LEADING-EDGE COMMUNICATIONS

You need communications services that are as flexible as your business requirements, to cost-effectively compete in a global marketplace. These services must not be interrupted and must scale over time to meet your evolving networking needs. Given the growing and far-reaching demands placed on the office of the CIO, control over these networks, when and where needed, is equally critical.

Shaw Business Solutions has the services you need today and as you grow. Our solutions provide the flexibility, scalability and control needed for you to thrive in the dynamic global marketplace. Shaw Business Solutions also provides a uniform architecture to support the ever-increasing need for multiple applications to be supported across the WAN, with the ability to prioritize each service appropriately. Most importantly, our solutions guarantee non-stop services, to ensure you have the reliability you need for your business-critical applications.

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