



Advisory Report:	Ethernet VPLS Momentum Will Continue into 2011
Report Date:	December 22, 2010
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Service:	Business Network and IT Services 
Market:	Business Network and IT Services - Global Enterprise  , Global Network Tracker  , Wholesale 

Summary

Issue

Any-to-any Ethernet Virtual Private LAN Services (VPLS), or 'E-LAN' services as-per the Metro Ethernet Forum (MEF) definition, are rapidly approaching a staple element in carrier global data WAN service menus. However there are regional inconsistencies and different technical approaches for delivering Layer 2 multipoint-to-multipoint solutions. For example Ethernet VPLS is mature in several domestic markets such as the UK and US, and approaching early maturity in pan-regional markets, such as intra-Asia, and for pan-European deployments. In contrast VPLS is less widely available in Latin American and Middle East/African countries. Furthermore trans-continental offerings are abundant between North America, Europe and the Asia Pacific region, with more destinations consistently being added to global carrier footprints.

There are also discrepancies in the features and functions being bundled into carrier Ethernet VPLS offerings, such as support for E-Tree broadcast domains, smart demarcation for advanced OA&M, end-point to end-point SLAs (as opposed to PE-to-PE), support for multiple CoS, and different pricing models, including the availability of bandwidth on demand or bursting. There are also contradicting messages being bandied about in the industry in terms of scalability, in other words what are the current MAC address limitations? This advisory considers whether Ethernet VPLS is cheaper than other multipoint data WAN solutions, for example IP/MPLS VPNs, from two sides of the coin: carrier OpEx and end-user pricing. Finally this report gives a current snapshot of existing VPLS services, which are the best-in-class services, the go-to-market messaging adopted by providers, and focus areas for on-going progress and development.

Perspective

Current Perspective

Technology

In most cases Ethernet VPLS platforms have been established to run over MPLS network assets, taking advantage of the traffic prioritization inherent in MPLS. **Tata Communications has embarked upon a PBB upgrade claiming the advantage of far greater MAC address scaling for a more future-proof solution.** Meanwhile, Colt offers Ethernet over static-path MPLS, giving predictable paths for the lowest possible latency routes.

Scalability

Typical numbers of sites supported by Ethernet VPLS networks run in the 30 to 40 range. However several operators are claiming unlimited numbers of sites can be supported leveraging spanning tree protocol. Verizon Business has published a white paper to this effect. **Meanwhile the Tata Communications PBB upgrade is designed to allow scaling to 16.7 million services (VLANs) based on the IEEE 802.1ah standard.**

Cost Benefits & Pricing

Despite Ethernet being positioned as a more cost-effective platform, there is little evidence in service provider messaging to corroborate Ethernet VPLS being a cheaper option for multi-site fully-meshed VPN services from both carrier OpEx and customer savings perspectives. There are fair points being made about the lower price of Ethernet interface equipment, but the negotiation is universally more complex considering such things as who manages routing tables, bandwidth needs, and the number and location of sites to be connected. There is also a fair argument in that Ethernet VPLS reduces network complexities and as a consequence costs in cases where the client needs to replace a multi-vendor and older legacy platform, which is increasingly expensive to manage and maintain and is under-performing.

Carriers are reporting a definite trend for the high bandwidth cost-benefit of leveraging Ethernet VPLS to interconnect major company HQ sites and data centers, but there is little, or no, activity for multitudes of outlying sites being interconnected on a 100% Ethernet VPLS full-mesh topology. In the UK market it has been observed that E-LAN is attractive for government bodies for allowing different departments to deploy logically separate and secured networks via VLANs over a single Ethernet VPLS solution for an efficient and simple network from a single source. It is important to note once again in the migration from legacy solutions that Ethernet VPLS may be attractive in terms of price due to more flexible pay as you go bandwidth pricing structures, or bandwidth on demand, that allow end-users to pay only for what is needed. But with the latter point we are seeing such capabilities limited to domestic in-country services, such as Verizon Business' bandwidth on demand offering available only in the U.S. and Singtel's eBOD, which is available in Singapore. eBOD is an innovative online bandwidth-on-demand feature that allows end-users to scale bandwidth according to demands within a very short time frame. The greater international market can anticipate these domestic products eventually being introduced to more countries and early-movers will surely enjoy strong sales differentiation.

The table below captures the current country availability by carrier for Ethernet VPLS service coverage, and the main thrust of the carrier's marketing messages and main strengths. For full details of MPLS country presence, VPLS countries, MPLS NNIs, Ethernet access and DSL access capabilities by carrier, Current Analysis offers the Global Network Tracker service. [Current Analysis Global Network Tracker](#). The data below is drawn from the Global Network Tracker:

Carrier	Marketing and Key Strengths	VPLS Reach
AT&T	Wide choice of IP VPN and Ethernet VPLS backed by strong online management. Large-scale global MPLS assets.	14 countries: 4 APAC, 10 W. Europe, and North America
BT Global Services (GS)	BT GS is not pushing international Ethernet VPLS. It sells data WANs based on strong global MPLS assets and managed IP services. 'Etherflow' was launched internationally mid-2010, and is primarily point-to-point. All Etherflow services come with smart demarcation.	4 countries in W. Europe
Colt	Colt is an Ethernet services pioneer and offers a well-proven and comprehensive product set. The carrier's main strengths are in pan-European deployments, but it can support services to North America and is expanding its footprint and E-NNI base.	19 countries: 5 E. Europe, 13 W. Europe, and the U.S.
C&W Worldwide	Strong IP/MPLS VPN and Ethernet VPLS offerings based on MSP deployments.	19 countries: 6 APC, 5 E. Europe, 14 W. Europe, and North America
Global Crossing	Robust VPLS offering backed by leadership in international VPLS	25 countries: 4 APAC, 13 W. Europe, 7 LatAm, and North

	coverage	America
NTT Com	High performance Ethernet VPLS with an APAC stronghold. Strong global IP/MPLS footprint underpins IP/MPLS VPN and Ethernet services for MNCs.	13 countries: 8 APAC, 4 W. Europe, and North America
Orange Business Services	'International Ethernet Link' was enhanced including the addition of VPLS in 2009. One of the leaders in terms of global IP/MPLS reach. Primary sales message for global managed VPN services is on the IP layer.	10 countries: 1 E. Europe, and 8 W. Europe.
PCCW	Strong proposal for Asia-based prospects, and good VPLS capabilities in Europe. Innovative Ethernet VPLS proposal.	17 countries: 9 APAC, 6 W. Europe, 1 Mid-East/Africa, and North America (US/Canada)
Reliance Globalcom	Early-mover in Ethernet VPLS, and one of the larger global VPLS footprints with specific regional strengths in the U.S., India and MEA/APAC.	19 countries: 7 APAC, 6 W. Europe, 4 Mid-East/Africa, US and Canada.
Singtel	Strong global VPLS footprint with APAC concentration, innovative products including eBOD pay as you go bandwidth (Singapore only).	19 countries: 13 APAC, 4 W. Europe, 1 Mid-East/Africa, and North America
Tata Communications	Early-mover in Ethernet VPLS, one of the first to launch smart demarcation (2008) and the largest global VPLS footprint of all. MEF award winner and PBB upgrade for multiple advantages including for example support for >16 million VLAN instances for large-scale full-meshed network.	39 countries: 14 APAC, 3 E. Europe, 11 W. Europe, 2 Latin America, 7 MEA, U.S. and Canada.
Telstra International	Strong Asia Pacific coverage and broad Ethernet range that complements IP VPN offerings. Innovative Ethernet range and carrier of choice for Australian networks.	14 countries: 12 APAC, 1 W. Europe, and North America.
Verizon Business	Aggressive Ethernet VPLS strategy and one of the largest international VPLS footprints. Innovative Layer 2 services that complement 'Private IP'. Consistent MEF-award winner.	38 countries: 9 APAC, 9 E. Europe, 17 W. Europe, 1 Latin America, US and Canada.

Best-in-class VPLS Coverage

Jostling for top place for global VPLS availability are Global Crossing, Verizon Business and Tata Communications. A quick review of the above table shows that the three largest Ethernet VPLS footprints are operated by Tata at number one with 39 countries, closely followed by Verizon at 38 countries. Global Crossing holds the number three spot with 25 countries covered and unmatched VPLS capabilities in the Latin Americas.

However each global VPLS player has unique advantages in specific regions, for example Global Crossing has leadership in Latin America and Caribbean, and robust coverage of North America and Western Europe. AT&T and

Verizon Business have natural strongholds in North America and Western Europe and reasonable capabilities in Asia Pacific, but less developed coverage in Latin America and little MEA coverage. Other competitive carriers in the global Ethernet VPLS space include KPN International, Telstra International, NTT Com and Reliance Globalcom – but these vendors tend to be strongest in their natural home territories with less widespread international VPLS reach. Other Asia Pacific players that have good pan-Asian VPLS capabilities plus links to Europe and North America include SingTel, PCCW and Hutchinson Global Communications (HGC). Customers' purchasing choice is therefore case by case depending on which operators have regional strongholds and more consistent overall international VPLS reach, according to the site distribution.

European incumbents are generally proving to be slower to respond to international VPLS rollouts, with some exceptions such as KPN International, which has been offering VPLS in 22 countries for more than two years. Orange Business Services is delivering Ethernet VPLS primarily in Europe across ten countries, while BT Global Services has not yet deployed an international E-LAN service, but this is under development and its international Etherflow offering has been launched across 11 European countries supporting point-to-point services.

At the time of writing T-Systems, Sprint and Telefónica Multinational Solutions do not offer international E-LAN, but developments are underway. In many cases established global IP/MPLS VPN players such as BT and Telefónica have well-established market share in the Layer 3 managed IP data networking space, and do not necessarily need to change these strategies with Ethernet VPLS arguably holding a niche position, such as high-speed and low-latency circuits for trading or data centre and HQ interconnection. In contrast a company such as Tata Communications is trying to achieve greater penetration in the multinational segment and is therefore more motivated to adopt a disruptive Ethernet WAN strategy to carve out market share.

As 2010 comes to a close, Ethernet VPLS has become a real candidate for international business VPN services. Nearly all the main global telcos either have products off the shelf, and those that do not are working on closing the gap. 2011 is sure to bear witness to expanded VPLS footprints, and enhancements in the areas of integrated online monitoring (with IP VPN on the same interface) and better OA&M and end-to-end (down to CPE endpoints) reporting and SLAs.

Recommended Actions

Vendor Actions

- **Tata Communications, Verizon Business, and Global Crossing, can justifiably claim leadership in the area of international Ethernet VPLS coverage.** Progress by other carriers to add more VPLS countries can be undermined as attempts to play catch up.
- Carriers with strong regional VPLS footprints, such as KPN International in Europe and PCCW in APAC, can be aggressive targeting accounts that have site distributions that closely match the available on-net coverage. Such providers can look to E-NNI partners to extend services off-net, and point out that all the other providers need to rely on third parties at some point for grand-scale international deployments, including for Ethernet access and longer circuits.
- BT, Telefónica and Orange Business Services, can continue to argue that Ethernet VPLS is not always the best choice for corporate data WANs, and that any competitor that pushes the technology on customers is trying to shoe-horn customers possibly into something they do not need. The mentioned vendors have market-leading IP/MPLS VPN offerings, and can step up with Ethernet point-to-point and partial mesh products wherever the need arises.
- Communicating a roadmap for extended VPLS coverage and E-LAN service enhancements, such as smart demarcation for end-to-end SLAs and other benefits, pay-as-you-go bandwidth on demand, and uniform monitoring tools across IP VPN and Ethernet VPN services, will be important in 2011 for remaining competitive in the international data WAN services market.
- **Competitors need to be aware that Tata Communications has an aggressive Ethernet strategy, supported by the largest international reach and a PPB upgrade that removes the problem of MAC address scaling.** Carriers such as BT, Verizon, Orange and AT&T, need to respond pointing out that Tata Communications is trying to build its retail enterprise customers base, and does not have the same long-standing tradition and established market

momentum in serving MNCs based outside of India. In short Tata has to do something different to shake apples from the tree into its basket, and hence is focusing in differentiating with Ethernet VPLS.

User Actions

- Customers should certainly inquire with service providers about how Ethernet VPLS would give benefits in terms of price, simplicity and performance. The technology is not really a replacement for existing IP/MPLS VPN services, but does have logical applications complementing IP VPN in a hybrid network, for example relying on VPLS to interconnect HQ locations and data centres on very high-speeds.
- Prospects need to match up geographical site distributions with the on-net capabilities of service provider Ethernet VPLS footprints, and choose a provider that has the closest matching on-net assets. **There is no super carrier with all-encompassing global reach, and the top three include Tata, Verizon and Global Crossing.** However it is wise to check regional providers, with for example NTT Com, Telstra, Singtel and PCCW potentially offering the best APAC service reach.
- Clients should seek to understand the value-added features available in the various VPLS portfolios in the market, such as whether smart demarcation is available for end-to-end SLAs (down to the customer premise), and uniform online monitoring tools across IP VPN and Ethernet VPN products. Customers should also inquire about the partnership policy including whether third party access tails and E-NNIs support a consistent service experience throughout the world.

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