The Value of PBB-TE and PLSB Infrastructure for Rural Healthcare Networks

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> Cost
  • By far lowest cost per port CAPEX solution

> De-facto standard for LAN
  • Simplicity
  • Plug and play
  • Compatibility

> Cost Effectiveness
  • Widespread use of Ethernet interface
  • Purchase bandwidth only when needed

> Flexibility
  • Single UNI can connect multiple services
    • Internet, VPN, Extranet supplier, Storage Provider
A Simpler Carrier Solution for Ethernet

Carrier Ethernet CAPEX Analysis

Simplicity

Inter-working with MPLS Networks

Operational Simplicity in the Metro

- SONET/SDH Operations model
- Superior OAM and SLA’s
- Ethernet cost points

Scales existing MPLS services
Evolution of Provider Ethernet

Ethernet evolved to meet Service Provider Requirements

- 802.1ah PBB
- 802.1aq PLSB
- 802.1Qay PBB-TE
- Y.1731 Performance Management
- 802.1ag Fault Management
- 802.1ah PBB

- Robust L2 Control Plane
- Traffic Engineering
- Proactive Management
- Service and Infrastructure diagnostics
- Scalable, Secure Dataplane
PBB Packet Walkthrough

Healthcare facility router

Payload

802.1Q

SA = Source MAC address
DA = Destination MAC address
VID = VLAN ID
C-VID = Customer VID
S-VID = Service VID
I-SID = Service ID
B-VID = Backbone VID
B-DA = Backbone DA
B-SA = Backbone SA

PBB UNI

802.1ad

PBT Header
VID/DA is used for forwarding (overloading existing header)

802.1ah Provider Backbone Bridge

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Provider Backbone Bridge (PBB)

- Service Scalability ➢ Up to 16 Million service identifiers
- Customer Separation ➢ Clear demarcation between customer and provider domains
- Core MAC Scalability ➢ Elimination of Mac explosions

Providers Service Provider Network Scale & Security
PBB – Traffic Engineering

- Resiliency ➢ 50 ms with 802.1ag
- Trunk Scalability ➢ Up to $2^{60}$ trunks identifiers
- Traffic Engineering ➢ Full path flexibility with QoS awareness
- No Spanning Tree ➢ No blocked links, no slow resiliency

Provides “SDH like” guaranteed performance & SLAs
Provider Link State Bridging

> PLSB provides a scalable, carrier grade complement to PBT for E-LAN and E-TREE services

> PLSB introduces the use of a link state networking protocol for Ethernet services
  • Enhanced Carrier Grade networking solution and network efficiency compared to traditional Spanning Tree protocols
  • The PLSB control plane achieves comparable functionality to MPLS with a fraction of the complexity

> PLSB builds on PBB and PBB-TE
  • Applies intelligence to how FDB’s are populated

> PBT (E-LINE), and PLSB (E-LAN and E-TREE) can operate side-by-side on the same network infrastructure
Services Delivery

> Flexible suite of connectivity offerings
  • Support for native Ethernet; point-to-point, point-to-multipoint and any-to-any topology options (E-LINE, E-TREE, E-LAN)

> Differentiated services
  • Traffic engineered PBT tunnels with bandwidth reservation and 50 ms recovery
  • Advanced on-box traffic management (5-8 classes of service, policing, filtering etc)
  • Operationally robust
  • End-to-end OAM tools; customer and provider clear demarcation; secure infrastructure
2007 Carrier Ethernet Ecosystem Members

Updated 12/07
Conclusion

> The combination of PBB, PBB-TE and PLSB enables cost effective networks for delivering E-Line, E-Tree and E-LAN services

> PBB-TE delivers SDH grade performance and rich OAM at the price level of Ethernet

> Provider Link State Bridging delivers robust carrier-grade networking for E-LAN services with fast restoration
Over 15,000 healthcare organizations in the US & Canada rely on Nortel solutions everyday.

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