

Provider Backbone Transport Networking

Host-to-host connections through SURFnet6



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Research Project 2



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Background

- SURFnet6
 - Hybrid
 - IP: packet-switched
 - Lightpaths: circuit-switched (with Quality of Service)
- Ethernet
 - Packet-switched (LAN)
 - Carrier ethernet (MAN)
- New ethernet extensions
 - Provider Backbone Bridges (PBB)
 - Provider Backbone Transport (PBT)

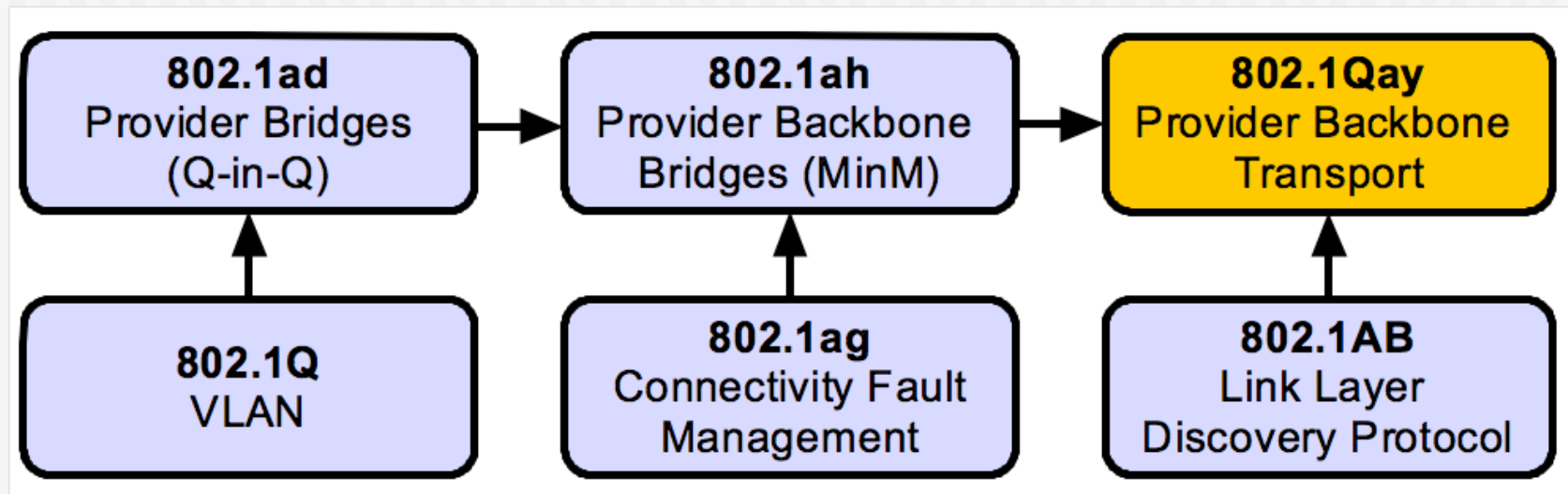
Research Question

“In which way(s) are SURFnet's customers able to setup an end-to-end connection through SURFnet6 and their own internal ethernet network, with use of the new ethernet extensions Provider Backbone Bridges (PBB) and Provider Backbone Transport (PBT)?”

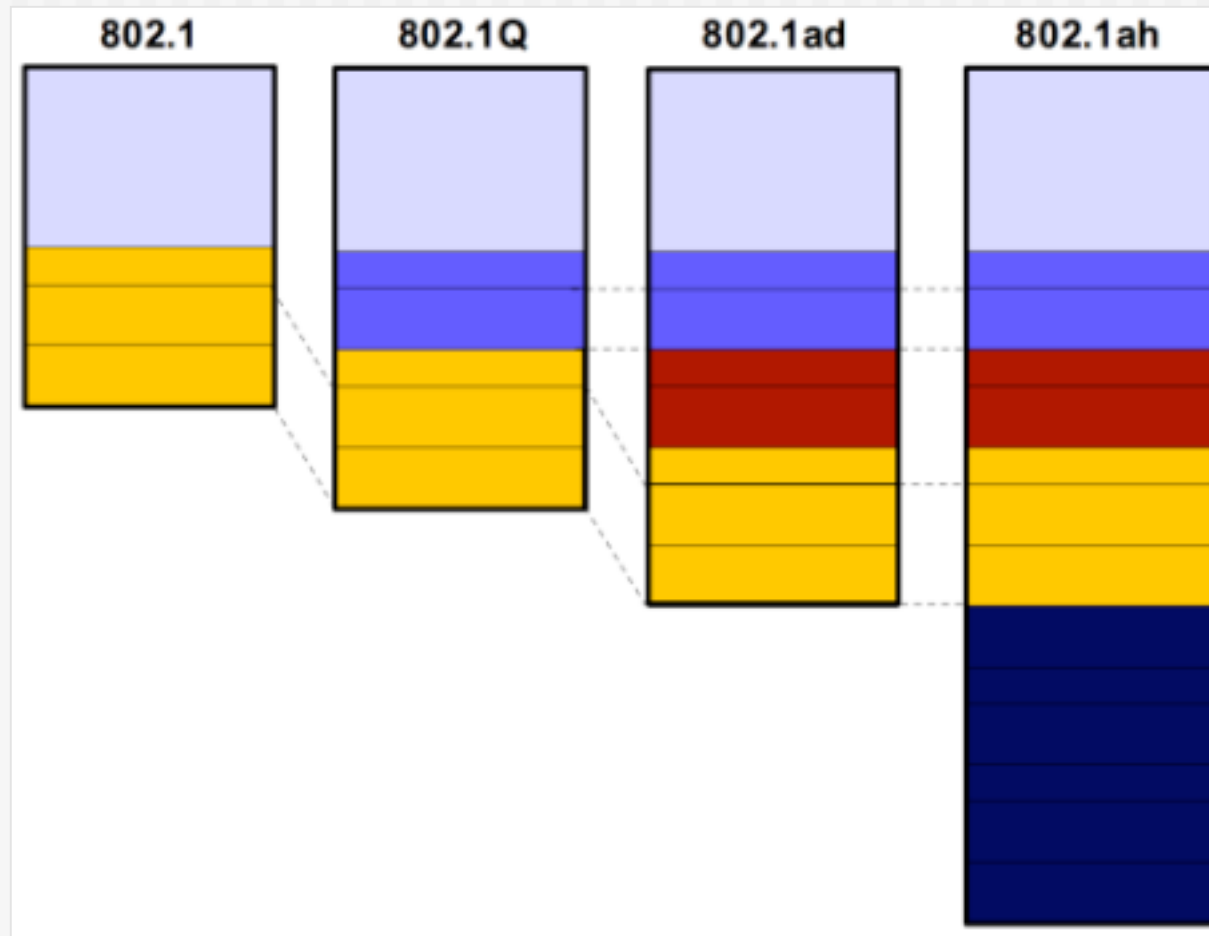
Research Methods

- IEEE Standard Documents
 - 802.1AB, 802.1ag, 802.1ah, 802.1Qay
- Presentation SURFnet6
- Interview
 - Ir. G.W.J. Jacobs, Nortel Networks
- Online articles

PBT Environment

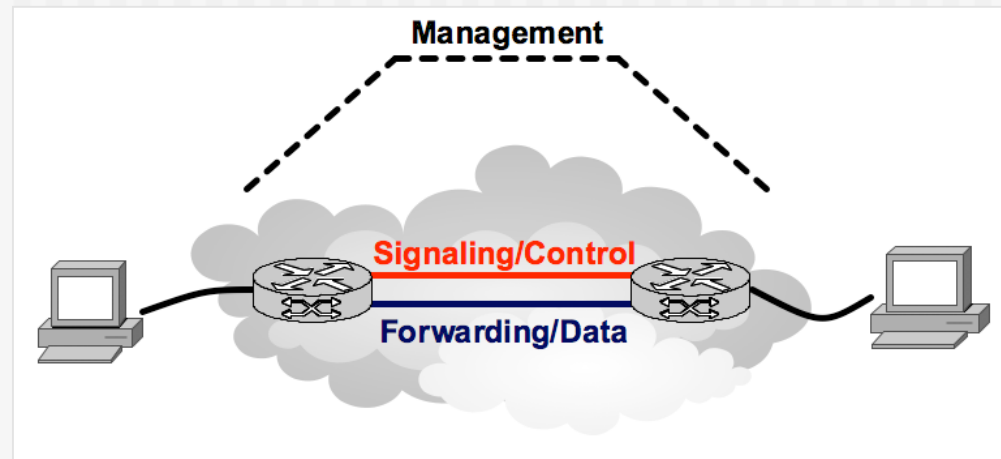


Provider Backbone Bridges



Provider Backbone Transport

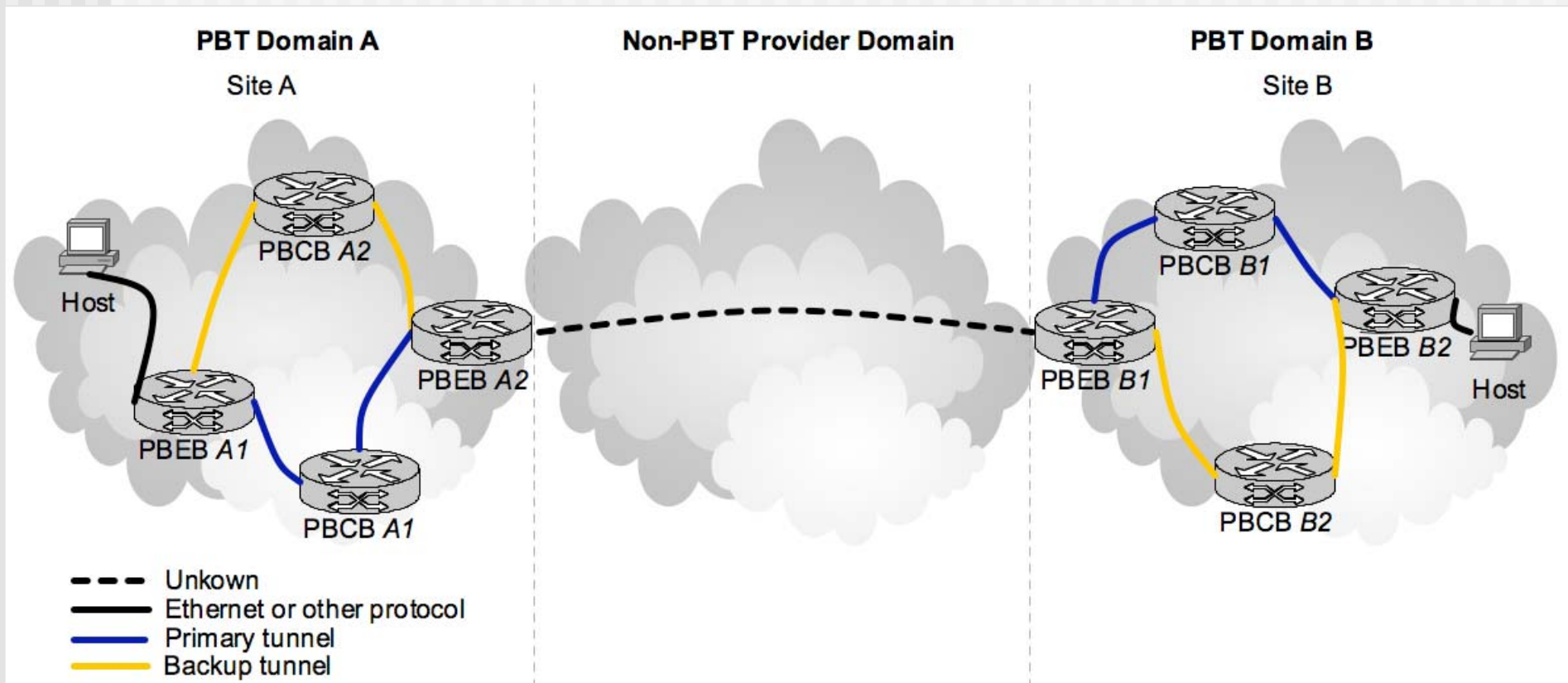
- No flooding of unknowns, broadcast and multicast
- No STP
- No MAC-learning
- Separated by VLAN
- Control Plane
 - Fail-over in 50 ms
 - Fills forwarding tables
- Primary and Backup tunnel
- Layer 2: Packet-switched → Circuit-switched



PBT Practical

- Customers only
- SURFnet6
- More solutions of implementing PBT can be found in our report

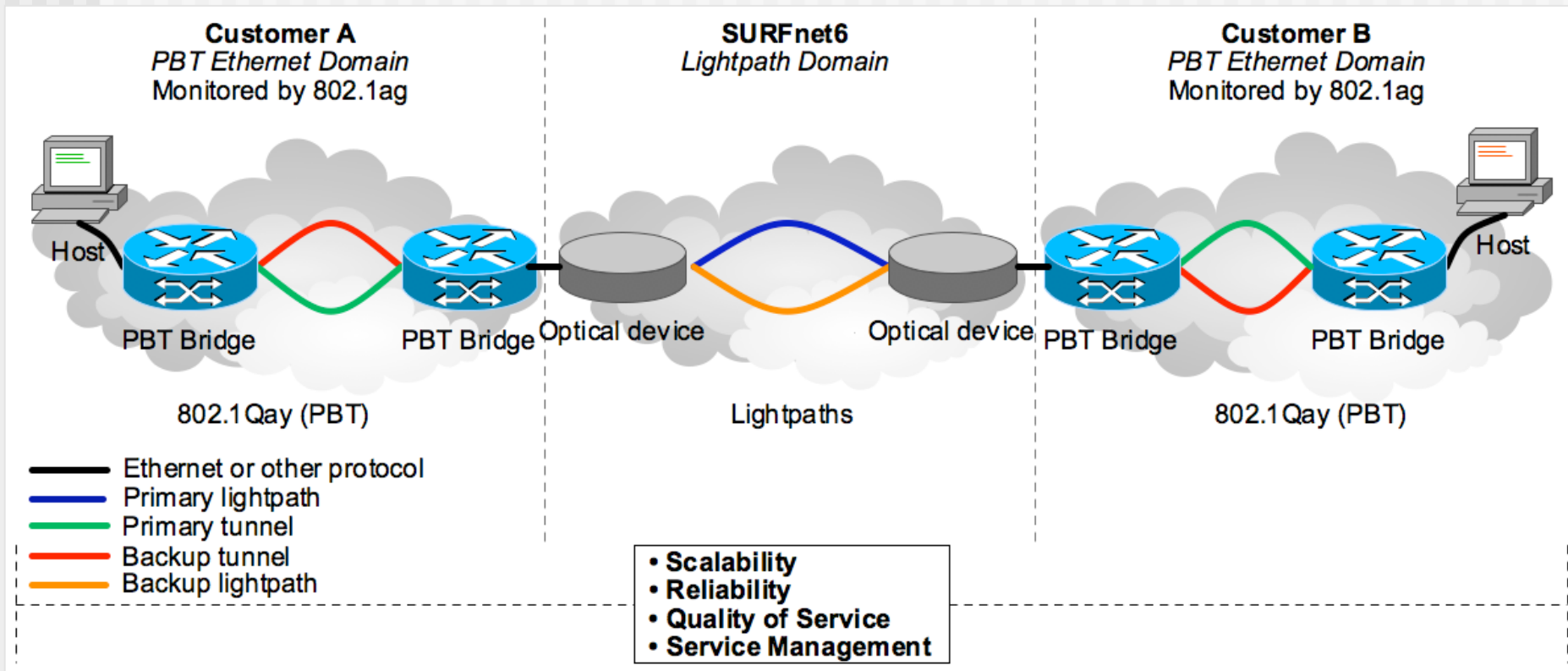
PBT Practical - Customers only



Practical to SURFnet6

- 3 Domains
- Unknown provider network
- (De)Encapsulation at Edge Bridges
- Introduces single points of failure

PBT and SURFnet6 (1/2)



PBT and SURFnet6 (2/2)

- 3 Control planes
- Implementation
 - Enabling PBT on at least two bridges per customer network
 - Placing at least two PBT Bridges (Edge Bridges) per customer network

Conclusion

- Protocols are described in our report
 - Many articles about PBT online, often first drafts or management summary
- SURFnet's customers can implement PBT
 - By enabling PBT on at least two bridges, or
 - by placing at least two Edge Bridges

Future Work

- Three control planes to one, with Soapstone Networks' PNC
 - Single PBT domain (PBEB -> PBCB)
- Expansion of PBT in campus networks
- Differences PBT and T-MPLS
- Research by SURFnet on exact implementation steps

The End

Any questions?