802.1ah in NetherLight:
An application proposal

Sevickson.Kwidama $\Rightarrow$ os3.nl
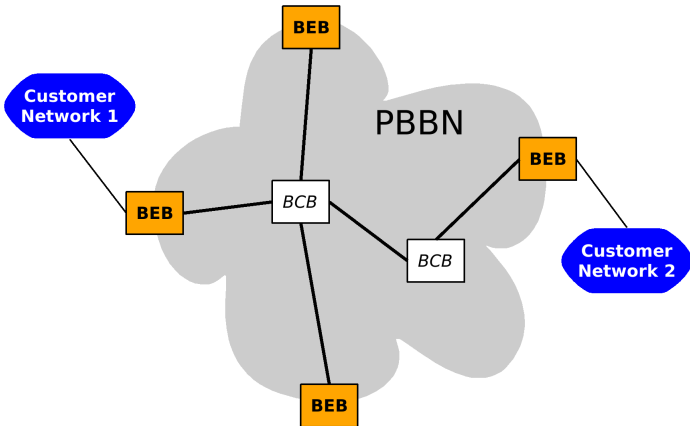
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UNIVERSITY OF AMSTERDAM

Provider Backbone Bridges (1)

Provider Backbone Bridges (PBB) implementation IEEE 802.1ah standard.

Forward customers frames over a service providers backbone network.

- Separate backbone network from customers (MAC-header)
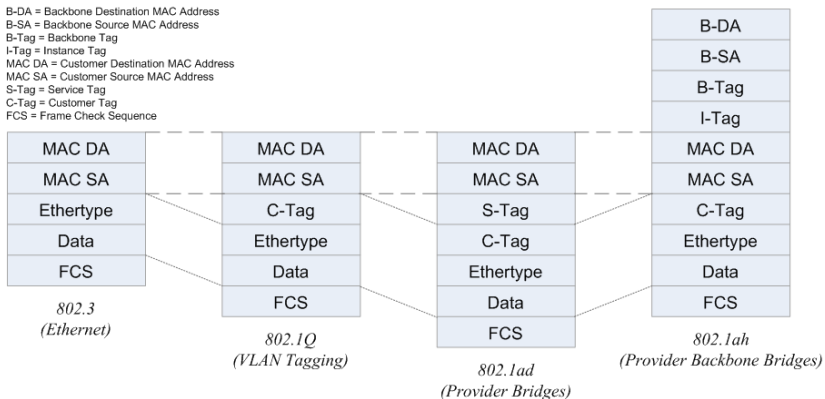- Increase number of VLANs (I-SID)

Provider Backbone Bridges (2)

PBBN = Provider Backbone Bridged Network
BEB = Backbone Edge Bridge
BCB = Backbone Core Bridge

PBB frame

B-DA = Backbone Destination MAC Address
B-SA = Backbone Source MAC Address
B-Tag = Backbone Tag
I-Tag = Instance Tag
MAC DA = Customer Destination MAC Address
MAC SA = Customer Source MAC Address
S-Tag = Service Tag
C-Tag = Customer Tag
FCS = Frame Check Sequence

			B-DA
			B-SA
			B-Tag
			I-Tag
MAC DA	MAC DA	MAC DA	MAC DA
MAC SA	MAC SA	MAC SA	MAC SA
Ethertype	C-Tag	S-Tag	C-Tag
Data	Ethertype	C-Tag	Ethertype
FCS	Data	Ethertype	Data
	FCS	Data	FCS
		FCS	

802.3
(Ethernet)

802.1Q
(VLAN Tagging)

802.1ad
(Provider Bridges)

802.1ah
(Provider Backbone Bridges)

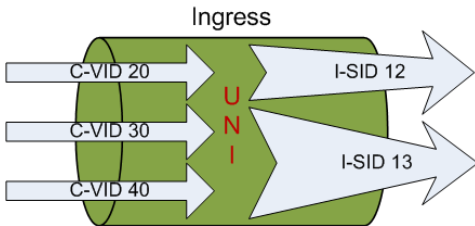# Research question 1

Connection Models question

How can PBB be used to support several connection models in NetherLight?

Transparent
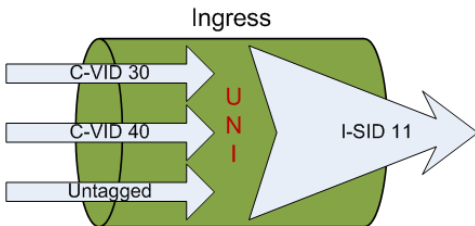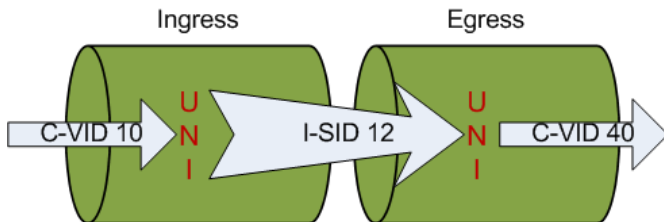

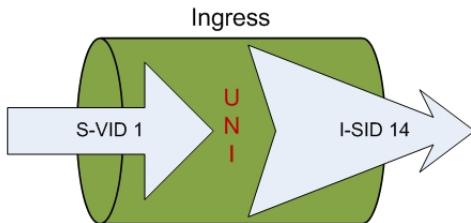- One I-SID
- Port based

Switched

- C-VID → I-SID
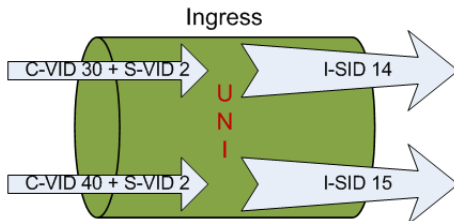- One-to-One / Many-to-One association

Retagging

- Change C-VID at egress

Q-in-Q (1)

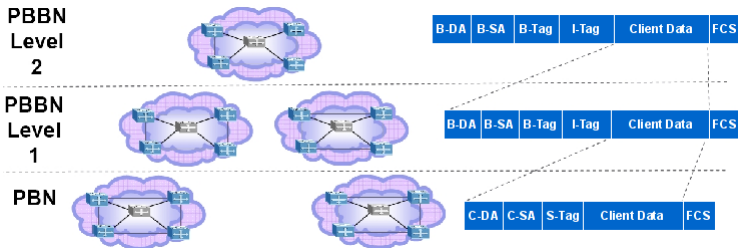- S-VID $\rightarrow$ I-SID
- One-to-One mapping

Q-in-Q (2)

- S-VID and C-VID → I-SID

Research question 2

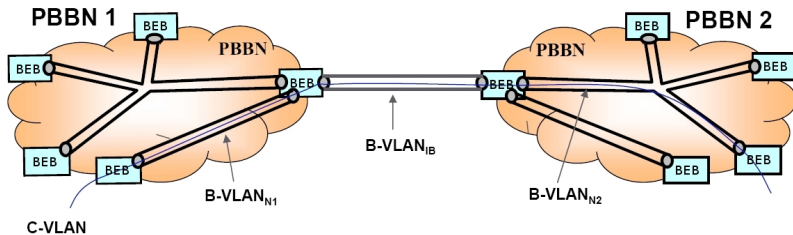**Multi-Domain question**

Can PBB be used in a multi-domain environment?

Hierarchical PBBN

- Leveled hierarchy
- Maximum nesting depth limitation

Peer PBBN

- Independent peers
- No nesting depth limitation

Future work

- Test setup of multi-domain environments
- Prolonged testing of PBB for later implementation

Conclusions

Connection models

Endpoint configuration, connection model based on situation

Multi-Domain

Peer PBBN is easiest model to configure and maintain between
network exchange points

PBB

PBB is mature enough to be used in prolonged testing
environments

Backup Slide (1)

Detailed I-Tag

I-PCP = Backbone Service Instance Priority Code Point
I-DEI = Backbone Service Instance Drop Eligible Indicator
UCA = Use Customer Addresses
Res1 = Reserved 1
Res2 = Reserved 2
I-SID = Backbone Service Instance Identifier

802.1ah
(Provider Backbone Bridges)

Backup Slide (2)