802.1ah in NetherLight: An application proposal

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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
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

PBB frame

MAC DA
MAC SA
Ethertype
Data
FCS

802.3
(Ethernet)

MAC DA
MAC SA
C-Tag
Ethertype
Data
FCS

802.1Q
(VLAN Tagging)

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

802.1ah
(Provider Backbone Bridges)

MAC DA
MAC SA
C-Tag
Ethertype
Data
FCS

Future work and Conclusions
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 → 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)

**I-Tag Ethertype**
- I-PCP
- I-DEI
- UCA
- Res1
- Res2
- I-SID

**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)