# DRNI: State of the Model Wars

Version 01

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- Coming out of the November meeting it seemed as though Norm, Maarten, and I were converging in our respective DRNI models.

- Since November it seems to me we are diverging again.

- This presentation attempts to highlight where I see the divergence.

- Hopefully it will help focus a discussion to see if we can start coming together again.

Review of the "stuff" concept

A general Link Aggregation model can be developed by grouping everything between the Relay and the Aggregator as "stuff". The details of the stuff varies with the type of port being aggregated. The following are example baggy pants models of an aggregated port on a simple VLAN bridge and on a Backbone Edge Bridge.
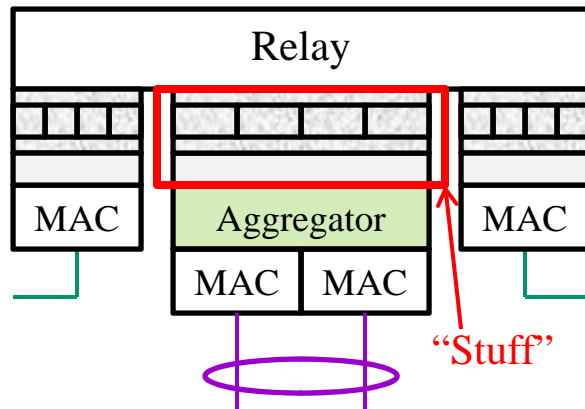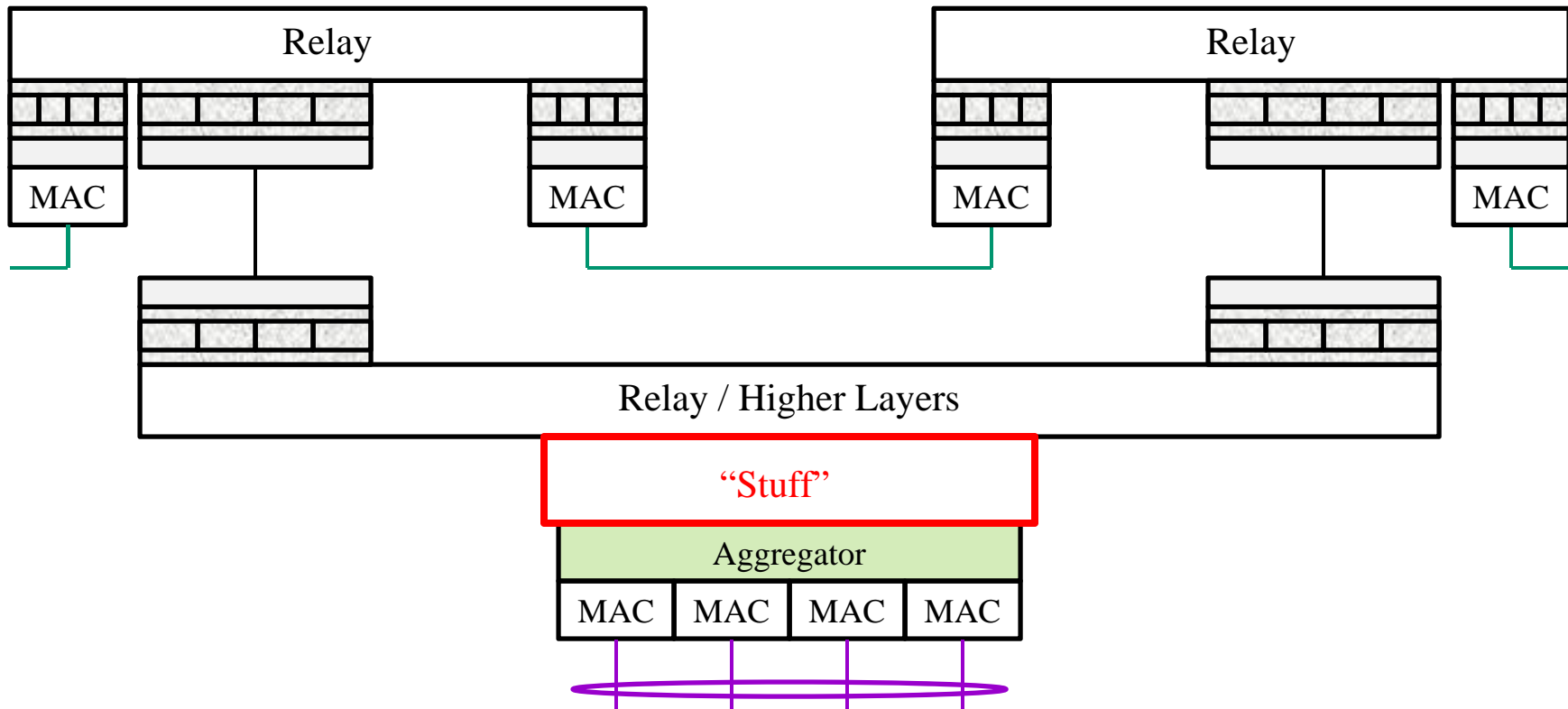

Example for C-VLAN or
S-VLAN component
(Case 1)
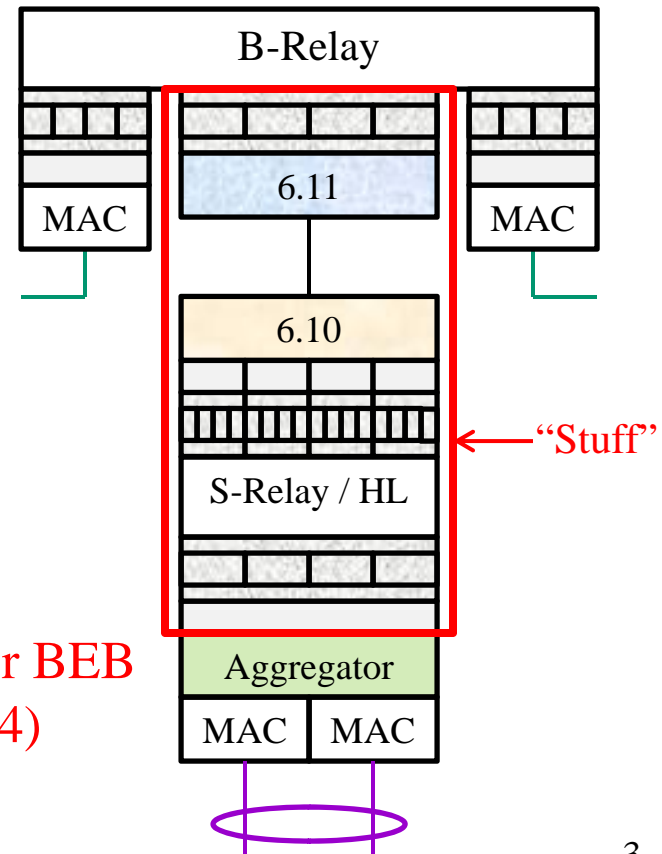
Example for BEB
(Case 4)

3

# Generalized Logical Component Model of DRNI

Generalized model has the primary component of each physical bridge logically connected to a logical third component. The logical component also has all of the "stuff" associated with the aggregated port.

Generalized DRNI Logical Model

Generalized Distributed DRNI Model

Where is the Intra-DAS Link?

Connecting the Distributed Relay?
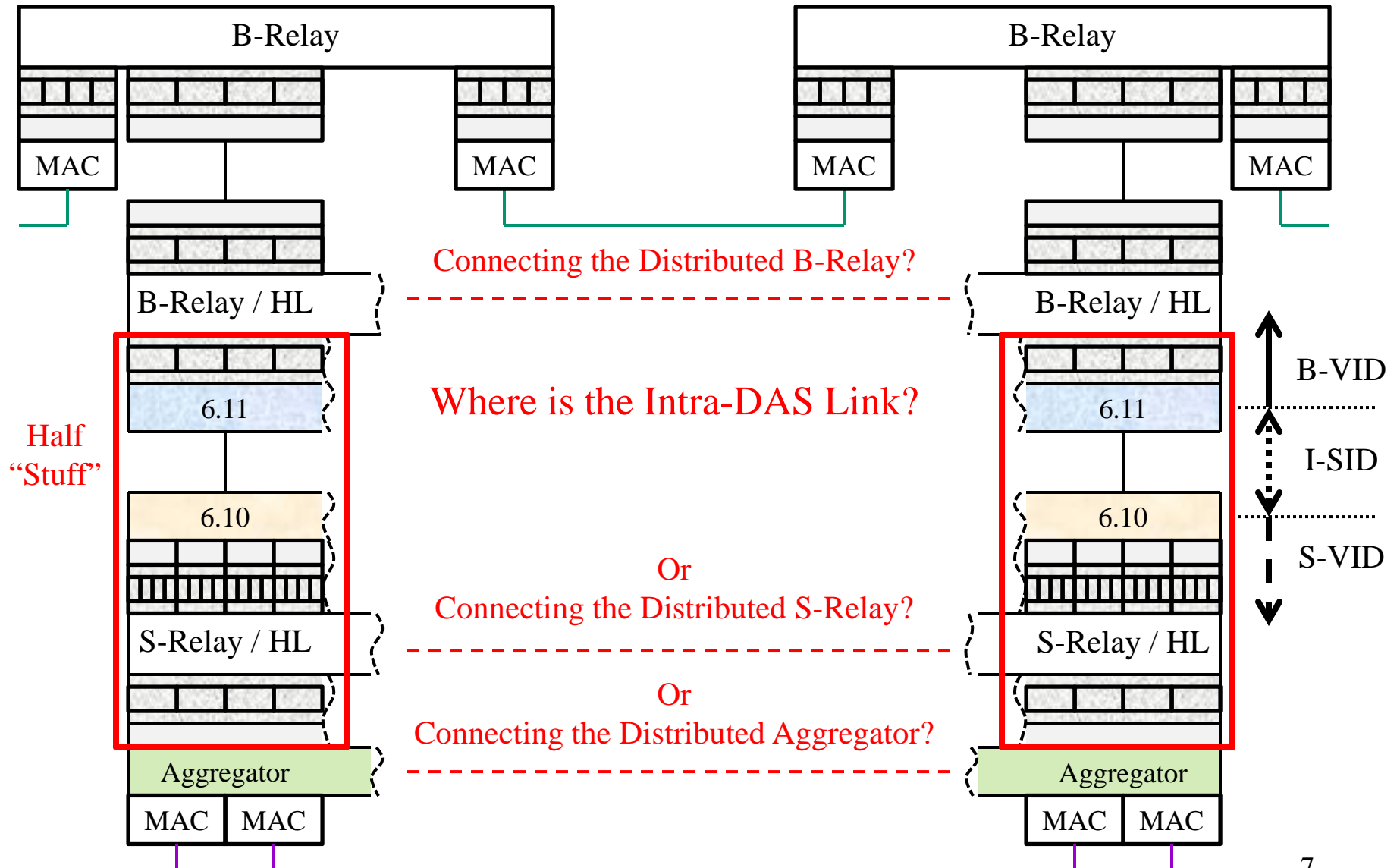
Or

Connecting the Distributed Aggregator?
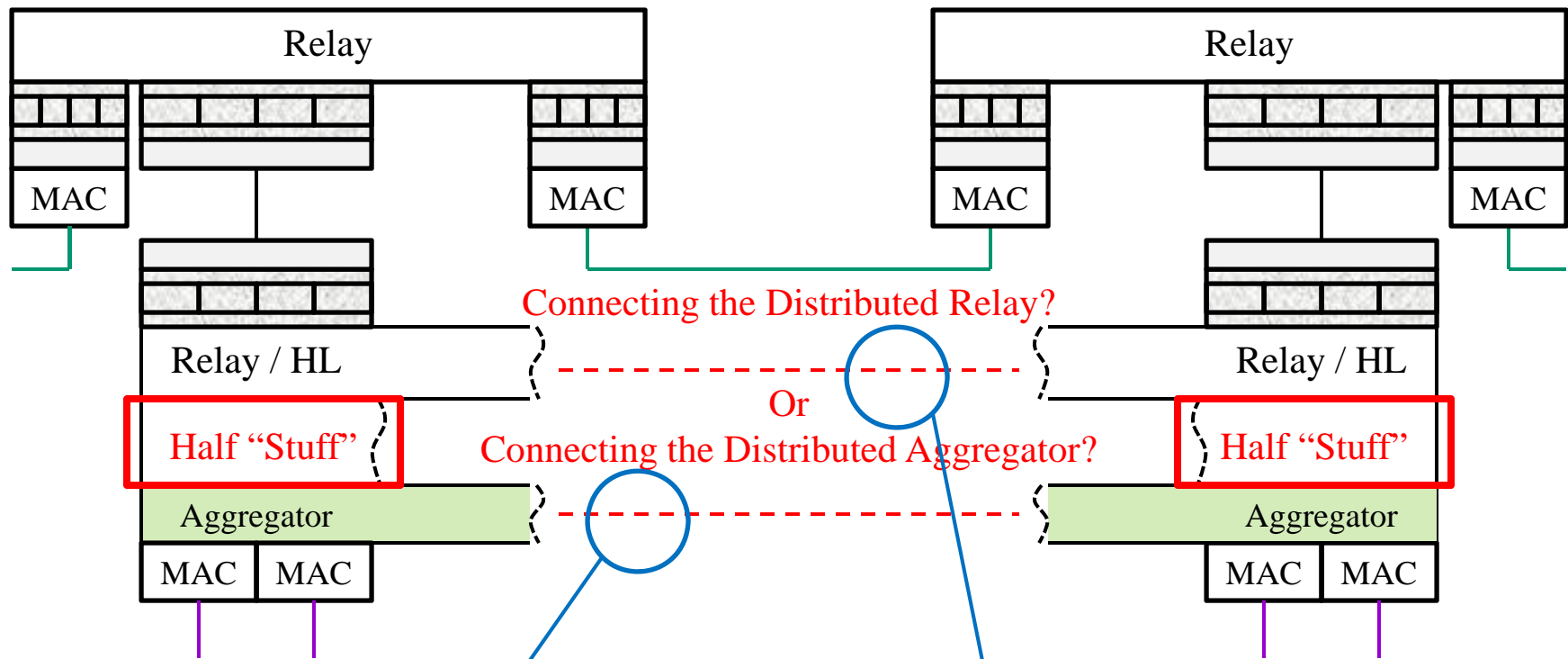
Prior to November 2011 my models had the Intra-DAS Link connecting the Distributed Aggregator.

By November 2011 Norm and Maarten had convinced me that it was better to have the Intra-DAS Link connecting the Distributed Relay.

- Moving the Intra-DAS Link up to the Distributed Relay went a long way toward reconciling my models with Maarten's, and I thought with Norm's.
  - See http://www.ieee802.org/1/files/public/docs2011/axbq-haddock-reconciling-models-1111-v01.pdf
- We still have different views, however, when it comes to the specific case of DRNI on a IB-BEB.

Distributed Component Model
S-tagged DRNI with IB-BEB

B-Relay

MAC

B-Relay

MAC

MAC

MAC

B-Relay / HL

Connecting the Distributed B-Relay?

B-Relay / HL

Where is the Intra-DAS Link?

6.11

6.11

B-VID

Half "Stuff"

I-SID

6.10

6.10

S-VID

S-Relay / HL

Or
Connecting the Distributed S-Relay?

S-Relay / HL

Or
Connecting the Distributed Aggregator?

Aggregator

MAC   MAC

Aggregator

MAC   MAC

7

Distributed Component Model
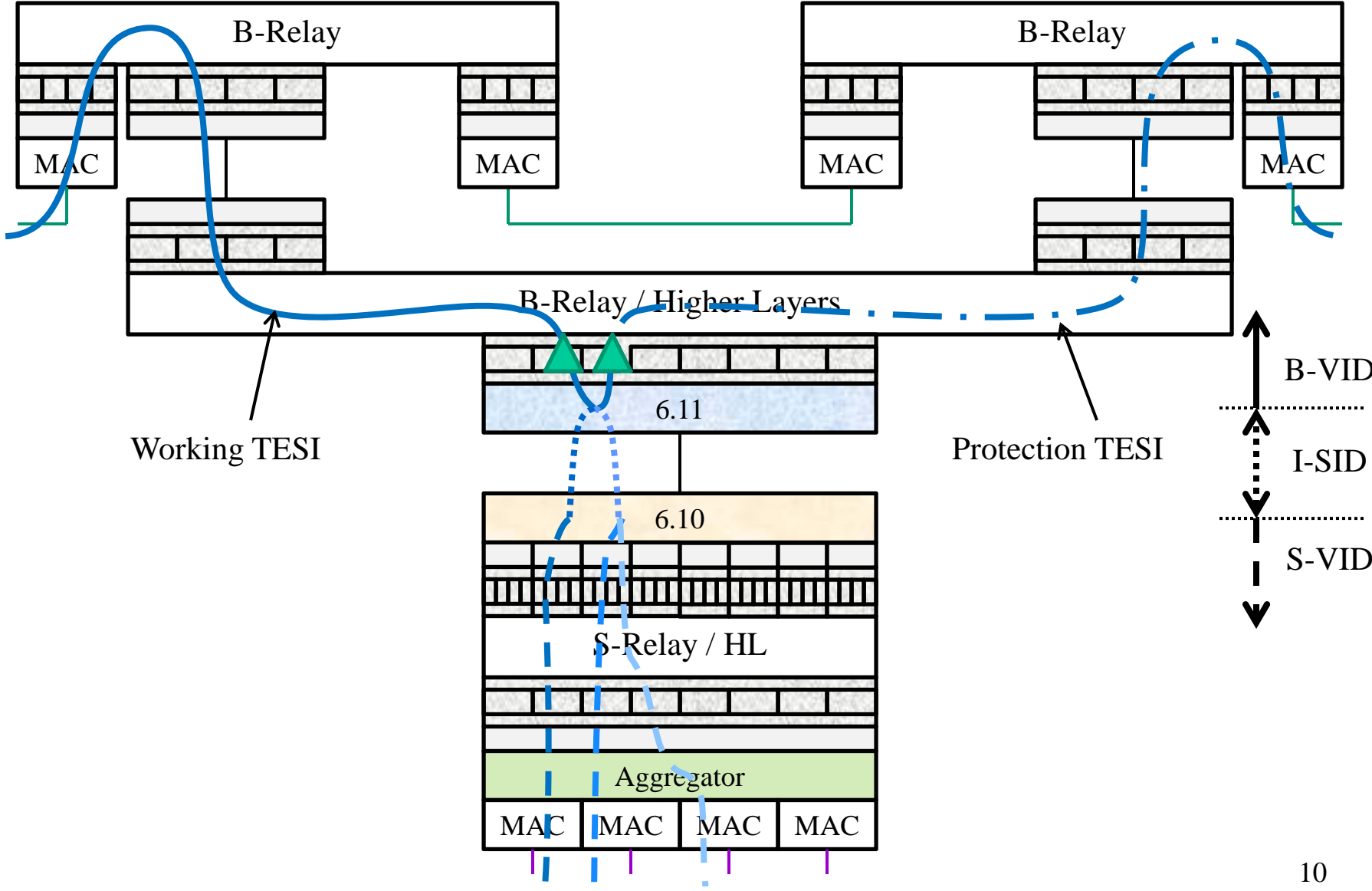## S-tagged DRNI with IB-BEB
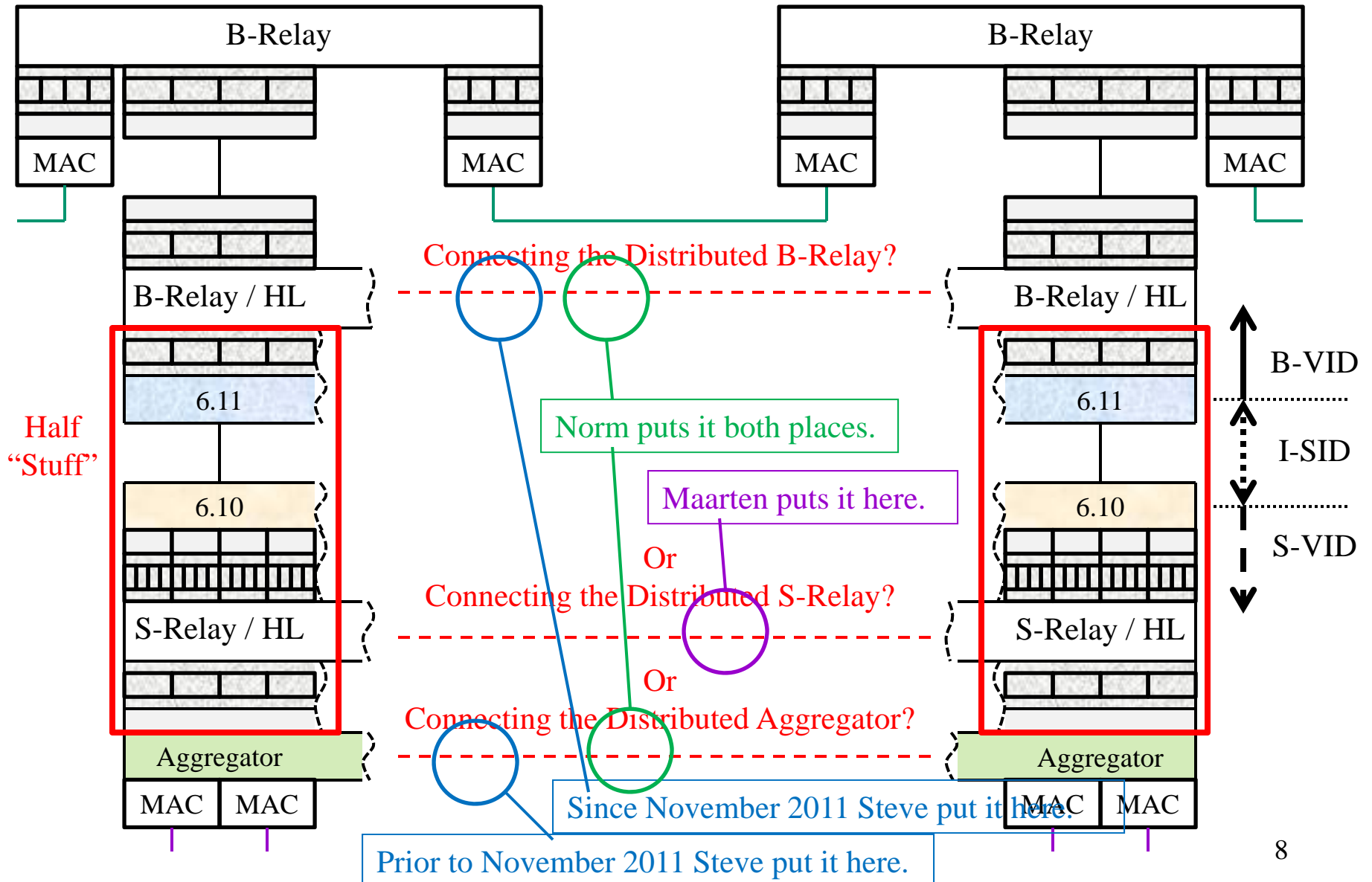
Comparing Steve's and Norm's approaches

Discussion focuses primarily on the placement of MEPs
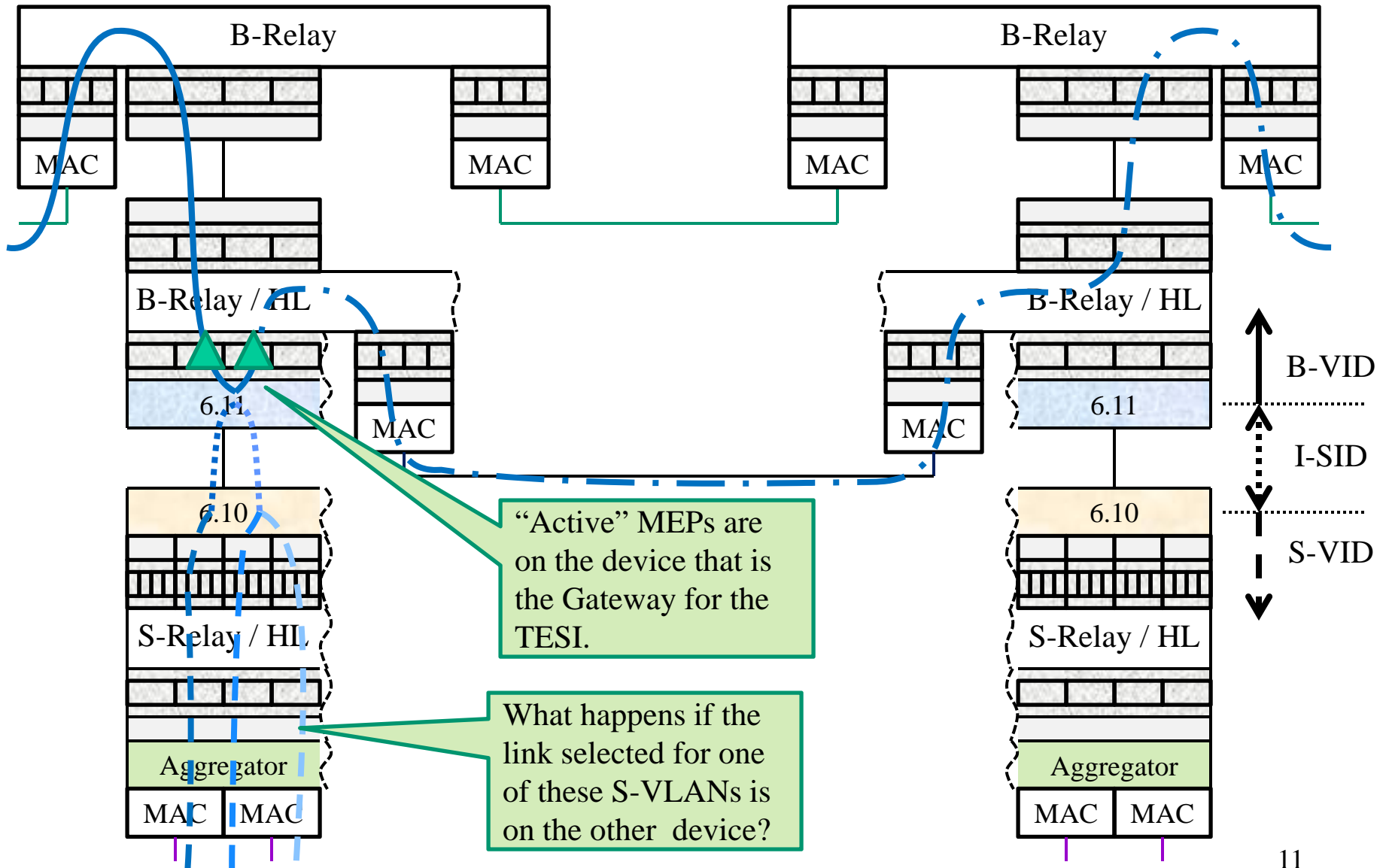
TESI Protection Switching
Logical Component Model

B-Relay

B-Relay

MAC

MAC

MAC

MAC

B-Relay / Higher Layers

6.11

Working TESI

Protection TESI

B-VID

I-SID

S-VID

6.10

S-Relay / HL

Aggregator

MAC   MAC   MAC   MAC

TESI Protection Switching
Distributed Component Model

B-Relay

MAC

MAC

B-Relay

MAC

MAC

B-Relay / HL

6.11

MAC

B-Relay / HL

6.11

MAC

B-VID

I-SID

6.10

S-Relay / HL

6.10

S-Relay / HL

S-VID

Aggregator

MAC MAC

Aggregator

MAC MAC

"Active" MEPs are on the device that is the Gateway for the TESI.

What happens if the link selected for one of these S-VLANs is on the other device?

Norm's IB-BEB DRNI Model

IB-BEB DRNI: Bridge view: TESI Prot.

TESI Protection Switching
Distributed Component Model

B-Relay

B-Relay

MAC

MAC

MAC

MAC

B-Relay / HL

B-Relay / HL

6.11

MAC

MAC

6.11

B-VID

I-SID

6.10

6.10

S-VID

S-Relay / HL

S-Relay / HL

MAC

MAC

Aggregator

MAC

MAC

MAC

Aggregator

MAC

MAC

Norm's proposal for moving an S-VLAN to a link on the other node

13

TESI Protection Switching
Distributed Component Model

B-Relay

B-Relay

MAC

MAC

MAC

MAC

B-Relay / HL

B-Relay / HL

6.11

MAC

MAC

6.11

6.10

6.10

S-Relay / HL

S-Relay / HL

Aggregator

Aggregator

MAC | MAC

MAC | MAC

B-VID

I-SID

S-VID

In Steve's model this pair of MEPs is distributed across the two DRNI ports and the Intra-DAS port.
I would argue that Norm's model actually distributes the MEPs across these ports as well.
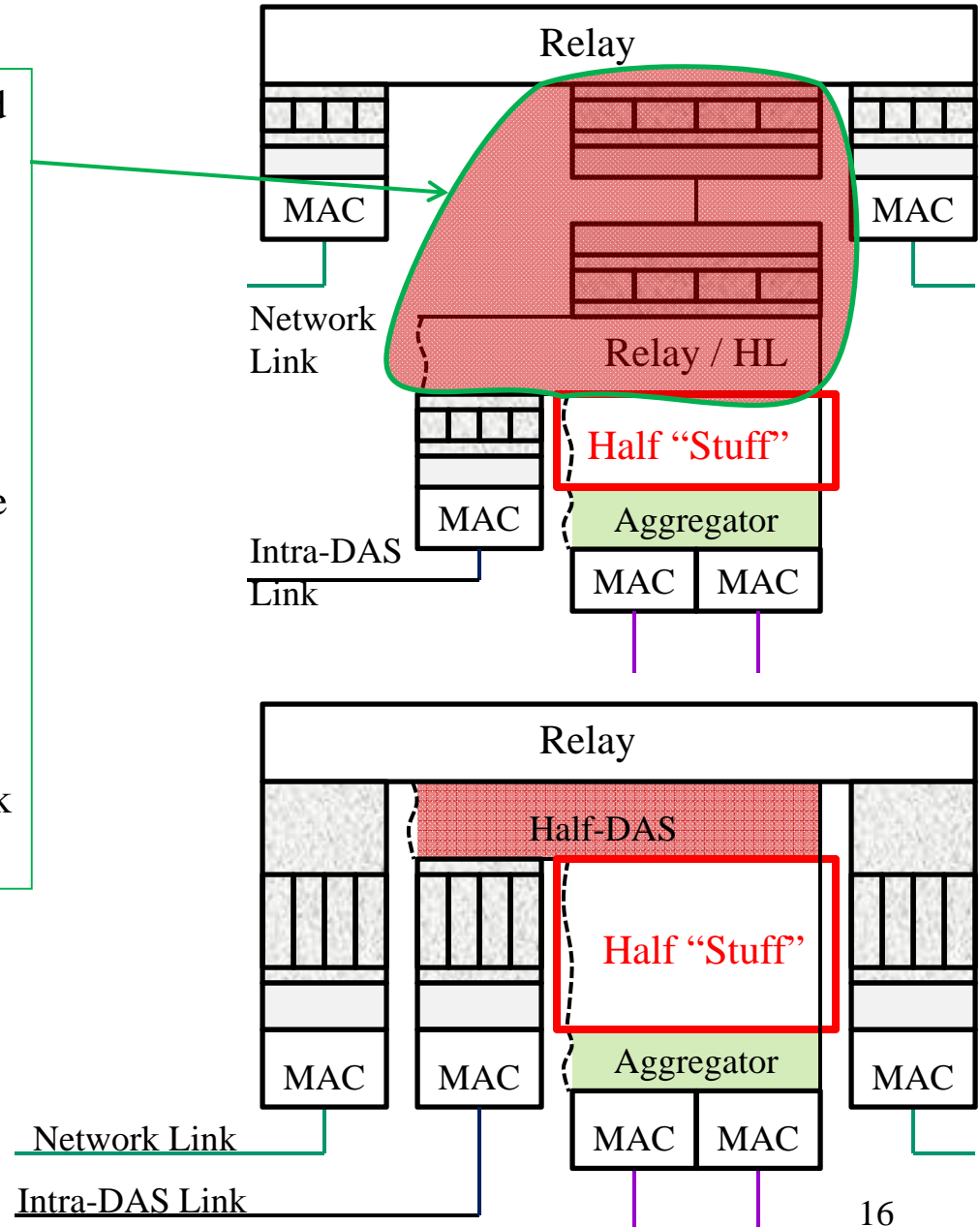
14

# Comparing Steve's and Maarten's approaches

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This includes the Gateway functionality and the intra-portal protocol, as well as providing the endpoint of the Intra-DAS link. This is a big part of what Maarten calls the Half-DAS.

Maarten's models still pull the Aggregator functionality (Collector, Distributor, and LACP processing) into the Half-DAS, while I still believe it belongs below "stuff" and directly above the MACs (where it is in the current Link Aggregation standard). That needs to be resolved, but for the current discussion all we are really concerned with is where the Intra-DAS Link attaches.

Relay

MAC

MAC

Network Link

Relay / HL

Half "Stuff"

MAC

Aggregator

Intra-DAS Link

MAC   MAC

Relay

Half-DAS

MAC   MAC

Half "Stuff"

MAC

Aggregator

MAC   MAC

Network Link

Intra-DAS Link

16

Ignore for the moment the question of whether the Aggregator functionality is inside the Half-DAS or just above the MACs. Maarten's model and my model agree that the Half-DAS contains the Gateway functionality and provides the attachment point for the Intra-DAS Link.

Furthermore we locate the Half-DAS in the same place for a DRNI on a single-component bridge.
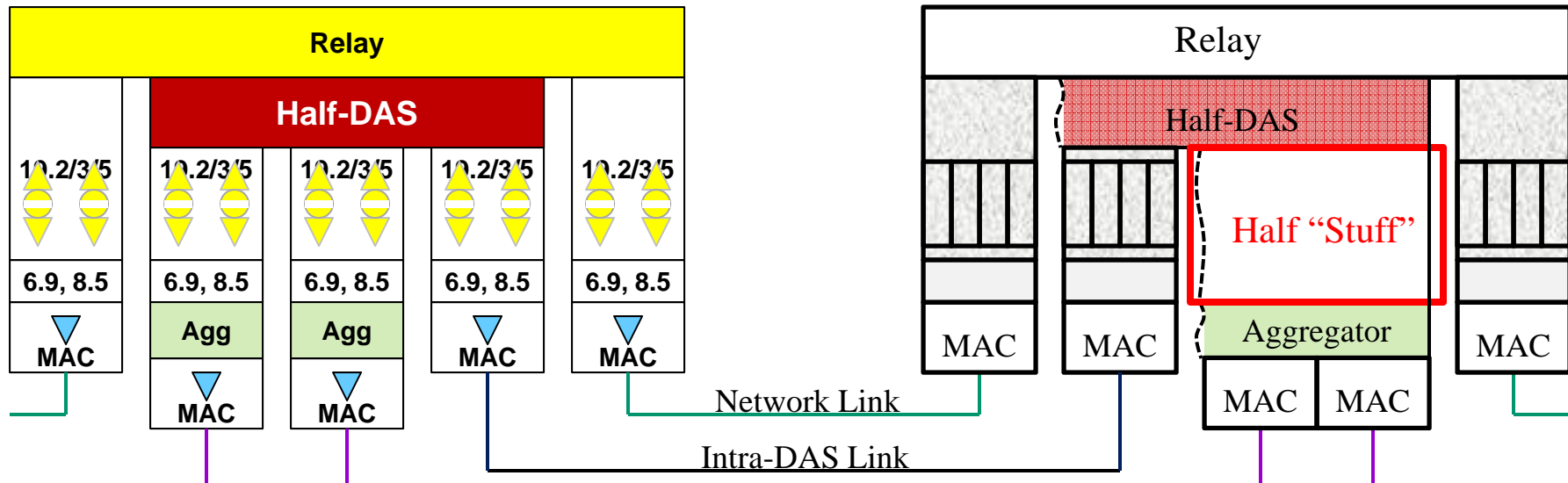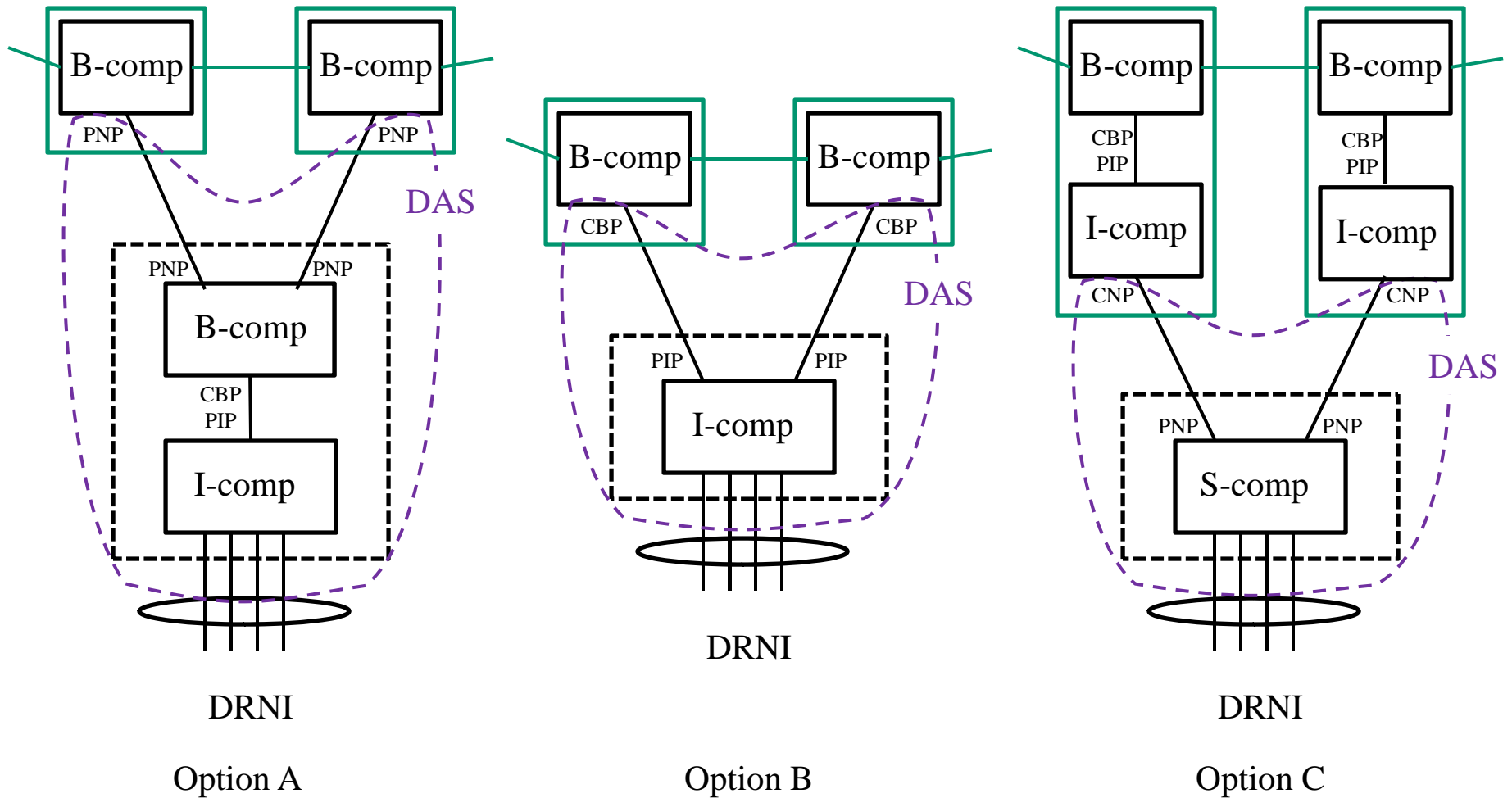
Maarten's IB-BEB DRNI Model
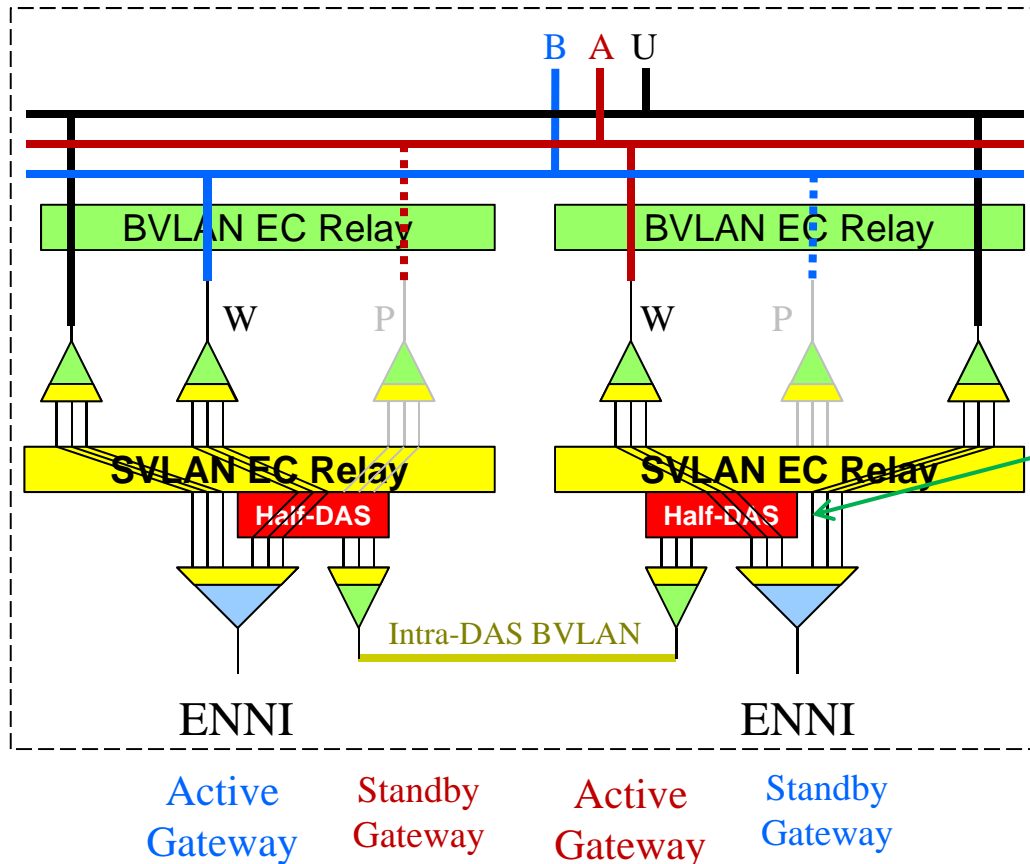
Notice that the Half-DAS and the Intra-DAS Link are at the S-VLAN Relay.
This is different from both Norm's and Steve's models. Just how different is difficult to say since have to make assumptions about the distributed components that Maarten doesn't show in his models.

http://www.ieee802.org/1/files/public/docs2012/axbq-vissers-dnp-architectures-0112-v5.pptx

Possible Logical Topologies of S-tagged DRNI with IB-BEBs

Option A

Option B

Option C

From slide deck generated during our "open discussion" day in Nanjing

19

- The only significant distinctions between options A, B, and C are in the control plane.

- If I'm correct that Maarten's Half-DAS includes the distributed S-relay, then his IB-BEB model appears to be either option B or C.

  – Both of these models have the same problem, assuming we want a single PIP and CBP addresses for the DRNI. Then you end up trying to have one logical CBP split between two components. This is the original Distributed Port model I presented in York (http://www.ieee802.org/1/files/public/docs2010/new-haddock-resilient-network-interconnect-LAG-0910-v3.pdf) . Mick and Panos pointed out the control plane problems that arise if attempt to have to have one logical port on appearing on two components. The Distributed Component model we have been using since was developed specifically to avoid these problems.

- If Maarten is assuming a distributed B-relay, then the IB-BEB model would be option A.

  – In this case Maarten's model is closer to Norm's and Steve's, but still has the Intra-DAS Link in a different place as shown on slide 8.

So where are we?

- The goal of this presentation was to try to focus in on where Norm, Maarten, and I still disagree.
  - Hopefully it will be helpful in framing a discussion to see if we can converge.

- My current position:
  - I still believe the best model for DRNI is the general model where the only difference with the different types of bridges is what goes in the "stuff" between the Distributed Relay and the Aggregator.
  - I still believe that the best location for the Intra-DAS link is connecting the Distributed Relay of the general model.