P802.1Qbe Draft 1.2 issues

Version 1
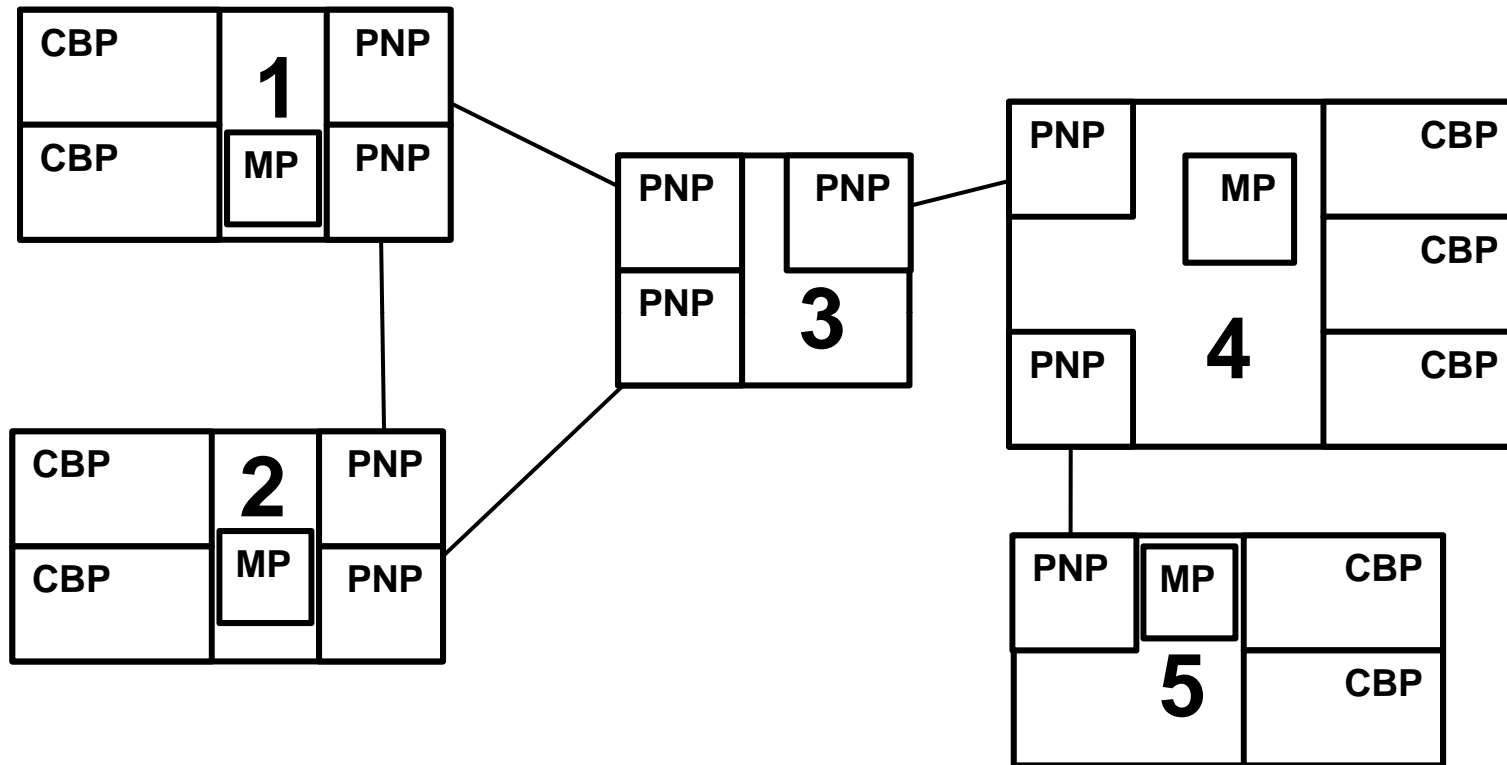
Norman Finn

Cisco Systems

References

- This presentation is at: http://www.ieee802.org/1/files/public/docs2010/be-d1-2-issues-0310-v01.pdf

- Draft 1.2 of P802.1Qbe Multiple I-SID Registration Protocol is at: http://www.ieee802.org/1/files/private/be-drafts/d1/802-1be-d1-2.pdf

Different ways to connect CBP MIRP Participants to each other
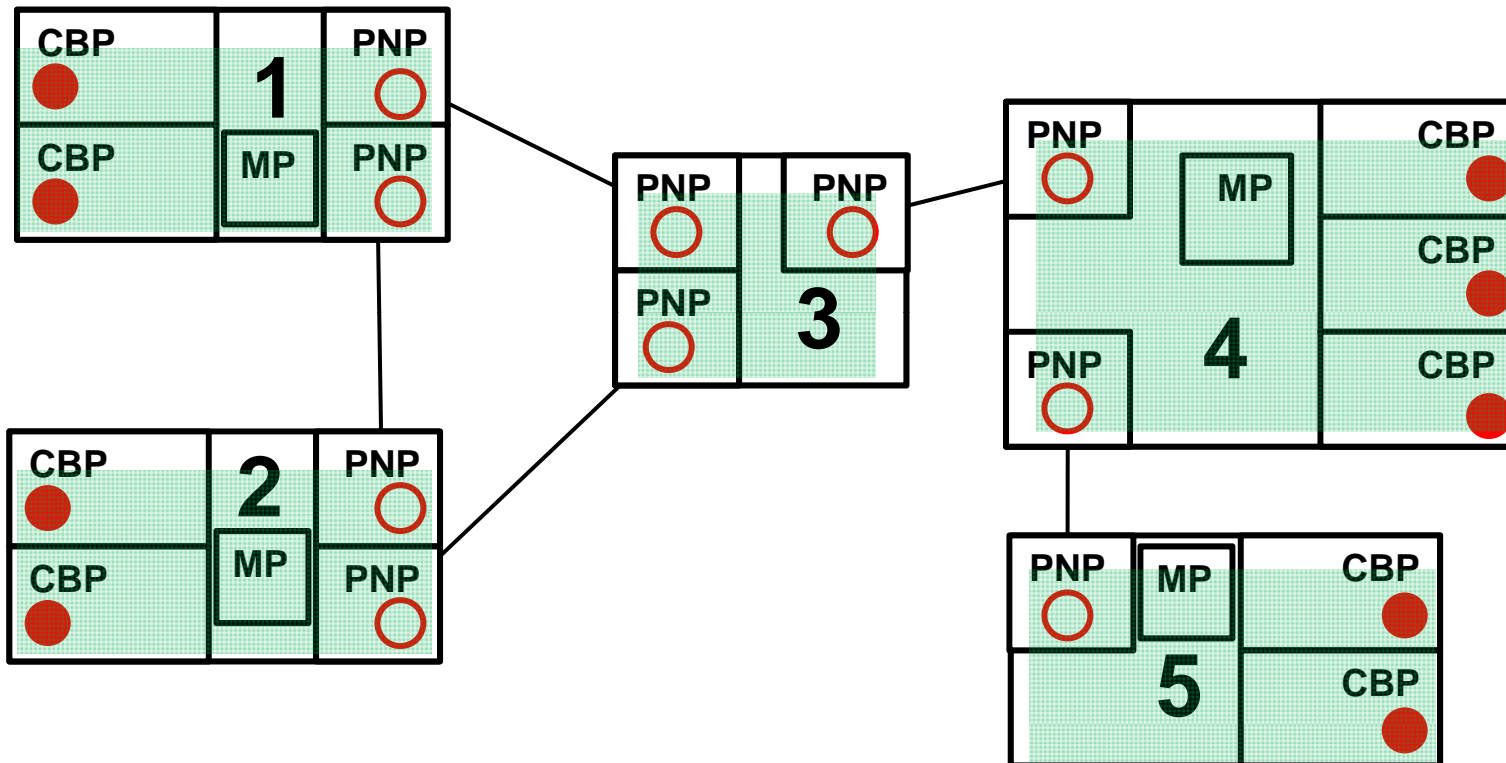

- Bridges, Provider Network Ports (PNPs), Customer Backbone Ports (CBPs), Maintenance Ports (MPs).

- (Presumably the 1-2-3 loop is broken by spanning tree.)

We know MIRP Participants go here
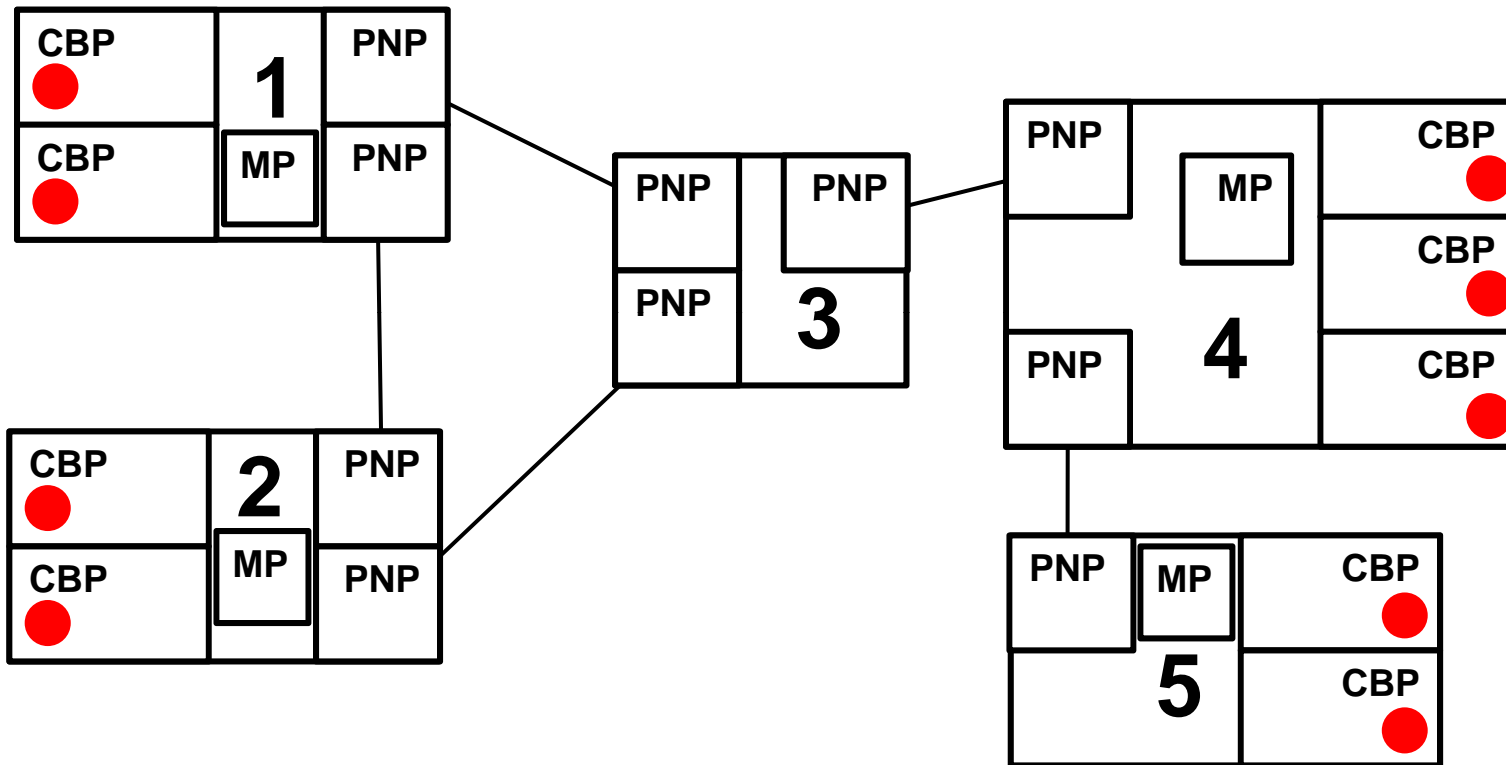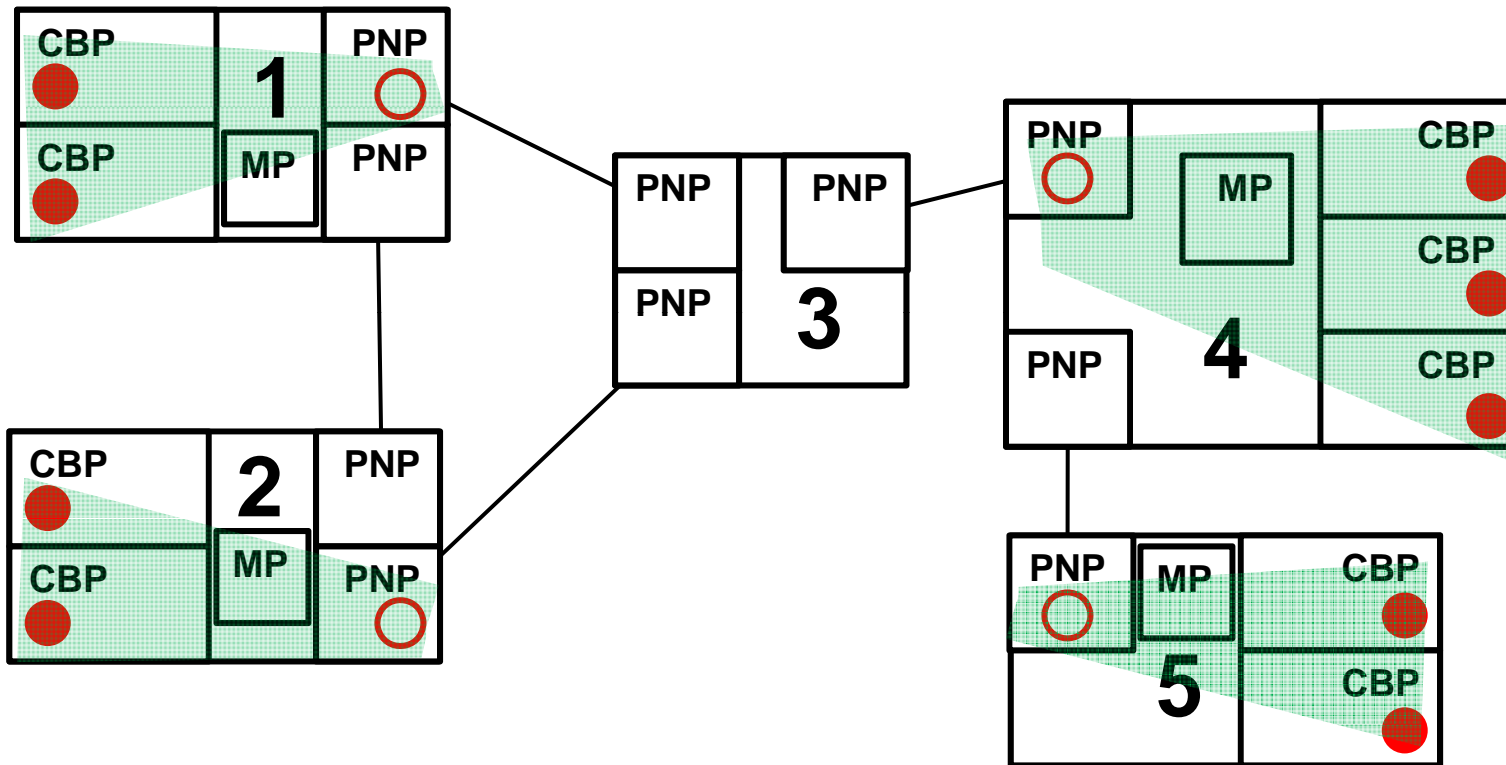

- But, how do the CBPs communicate with each other?
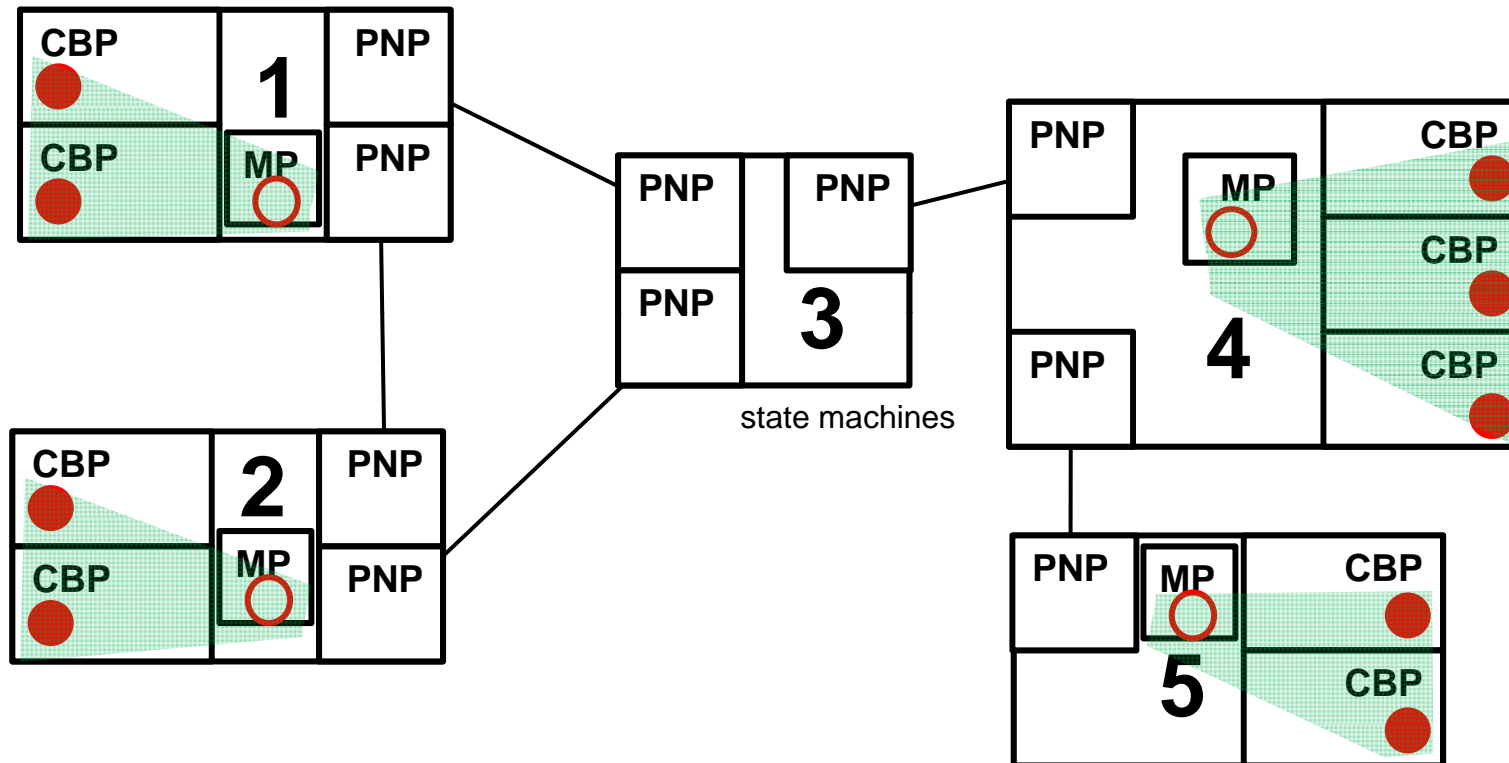
Where else? Option 1: All PNPs

- (MIRP MAP shown shaded)

- **PROBLEM**: Bridge 3 has millions of state machines it doesn't need, as may the lower-left PNP on Bridge 4.

Where else? Option 2: One PNP

- **FIX**: No MIRP state where not needed

- **PROBLEM**: Every circled PNP must subscribe to every B-VLAN and every Multicast address used for data!

Where else? Option 3: Maintenance Port

state machines

- **FIX**: No MIRPDUs where not needed

- **PROBLEM**: Management Ports must have multiple overlapping contexts and access CBP's configuration.

Where else? Option 4: CBP only
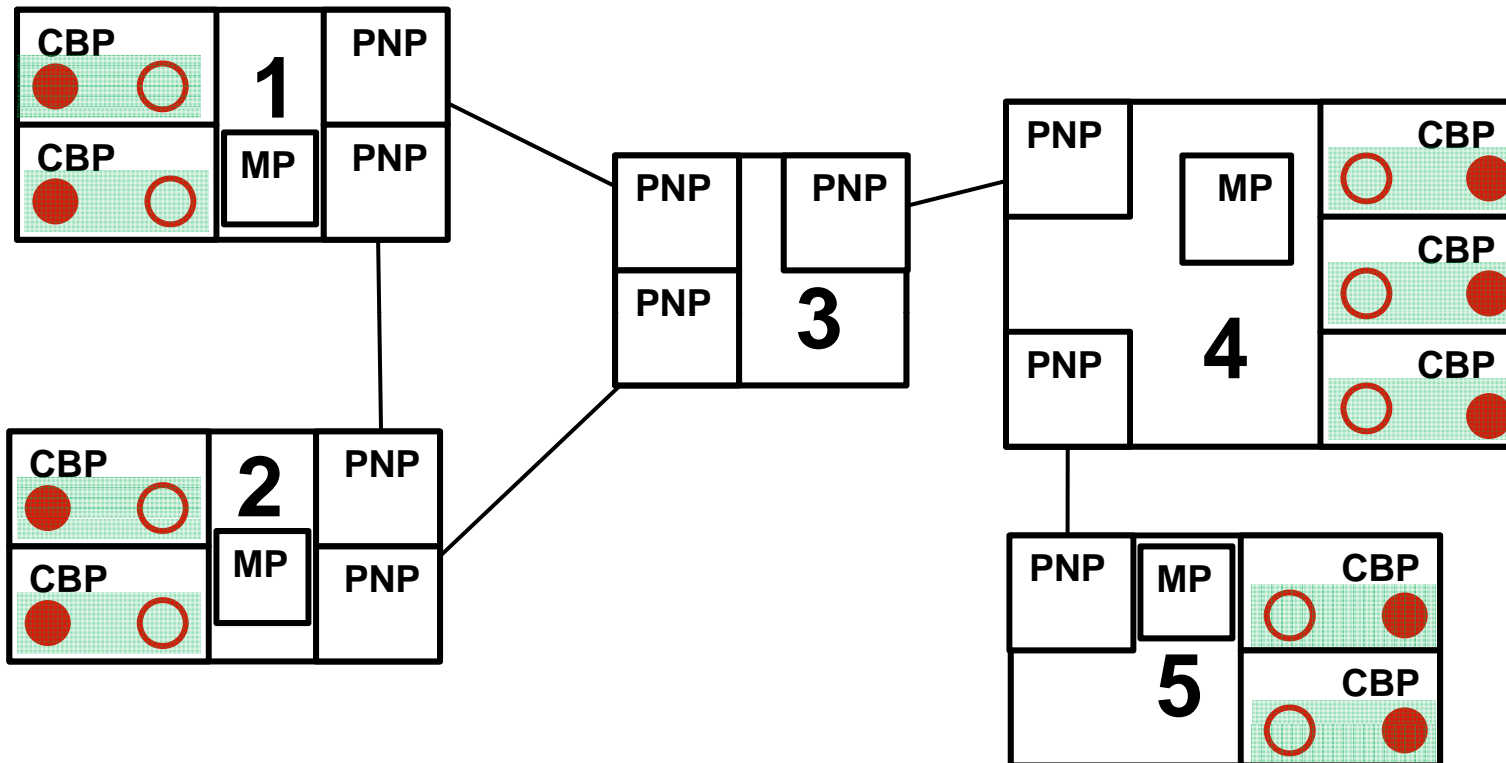
- **FIX**: Only local information needed, no context ID

- **PROBLEM**: CBPs apparently communicate via MIRPDUs even within a chassis.

Analysis

- Option 1: (Every PNP) is a no-brainer negative. There is simply no need to regenerate MIRPDUs at every PNP across the backbone.

- Option 2: (One PNP) is currently specified. Issues:

    The wire attached to the PNP must receive all MIRPDUs and (in theory, if not in practice) **data traffic** in every B-VLAN for which the bridge has a CBP configured.

    The PNP really should have a MEP on all of those B-VLANs, also.

    The MAP Context problem is present (explained on a later slide).

    If a service spans multiple CBPs, the PNP must select one of those CBP's configurations to use to generate each MIRPDU.

Analysis

- Option 3: (Maintenance Port) is currently specified. Issues:

    All of the same issues as the PNP, although it is easier for the MP to ignore unwanted data traffic.

- Option 4: (CBP only) was specified in Draft 1.1, and is now an alternative with an ill-defined relationship to the MP/PNP alternative. Issues:

    The CBPs communicate with each other via MIRPDUs, instead of communicating via the MAP (in theory, if not in practice).

    We must define a function similar to clause 8.5 Bridge Port Transmit and Receive to support the second MIRP Participant.

The MAP Context issue

- Within one CBP or one I-component, there is a 1:1 relationship between I-SID values and services.

- In a BEB with multiple CBPs, a single I-SID value can represent either the same service or different services in different CBPs.

- If they represent different services, the distinction between services can be maintained (or confused!) on the basis of the B-VLANs and/or destination MAC addresses configured in the CBPs.

- Then, if the One PNP or the Maintenance Port options are used, the PNP/MP must know those B-VLAN and MAC address differences, and utilize them as "MAP Context Identifiers" to keep the services separated.

The MAP Context issue

- When outputting MIRPDUs, Options 2 or 3 (PNP or MP) require the MP or PNP to figure out which CBP configuration(s) to use to build the MIRPDUs.

Viable MP solution: MAP Context creation

- If MIRPDU destination is {MIRP B-VID, Nearest Customer Bridge}:

    There is only one MAP Context.

- If MIRPDU destination is {CBP B-VID, Nearest Customer Bridge}:

- If MIRPDU destination is {CBP B-VID, Default backbone destination}:

Viable MP solution: CBP selection

- A possible method:

  An MIRPDU is generated only from MIRP state machines belonging to the same MAP Context, and therefore distinguishable by I-SID.

  For each I-SID, the CBP with the lowest Port Number that serves that I-SID (in this MAP Context) is selected to supply the configuration for generating the MIRPDU.
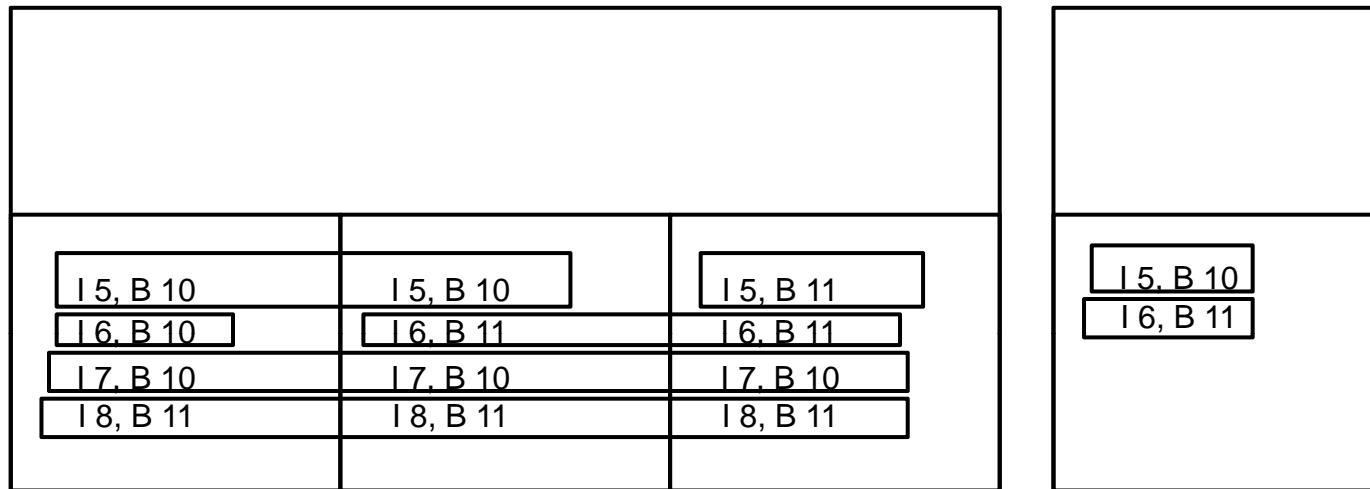
  As many MIRPDUs are generated as different answers are generated for the destination MAC address and B-VLANs over all of the I-SIDs.

MAP Contexts must be globally configured

Possible Context configuration 1	B 10 I 5, 6	B 11 I 5, 6	B 1 I 7, 8	(B1 is the MIRP B-VID)
Possible Context configuration 2	B 10 I 5, 6, 7	B 11 I 5, 6, 8		

I 5, B 10	I 5, B 10	I 5, B 11
I 6, B 10	I 6, B 11	I 6, B 11
I 7, B 10	I 7, B 10	I 7, B 10
I 8, B 11	I 8, B 11	I 8, B 11

B 1 all

B 10	B 11
I 7	I 8

I 7, B 10
I 8, B 11
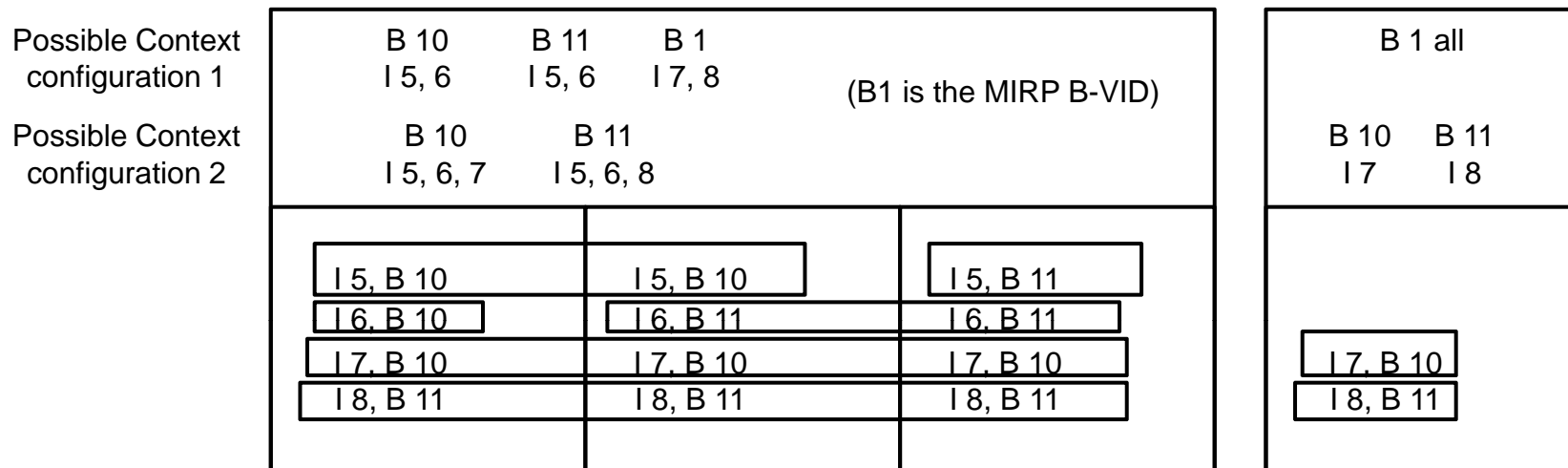
- Both Bridges must agree on context identification. If the right-hand Bridge sends an MIRPDU for I7 and I8 on B1, and the left-hand Bridge uses configuration 2, it will flush I7 or I8, or perhaps neither, but definitely not both.

- The right-hand bridge does not have sufficient information to automatically do the right thing.

Similar for CBP-only option

I 5, B 10	I 5, B 10	I 5, B 11	I 5, B 10
I 6, B 10	I 6, B 11	I 6, B 11	I 6, B 11
I 7, B 10	I 7, B 10	I 7, B 10	
I 8, B 11	I 8, B 11	I 8, B 11	

- Problem on previous slide does not exist in CBP-only.

- However, a similar problem can arise in the case above. If the right-hand bridge sends one MIRPDU for I5 and I6 in the MIRP B-VID, this will be accepted by all of the CBPs in the left-hand bridge, and result in the unwanted flushing of {I5, B11} and {I6, B10}.

What controls are required?

- The controls in D1.2 are sufficient if the only-CBP option is taken. (In the previous case, you would not use the MIRP BVID in the right-hand bridge.) Configuration errors or differences among bridges can result in excess flushing.

- If we specify the MP option, then we require all bridges in the network to be configured the same way with regard to MIRPDU transmission, and we must add that they use the same configuration when receiving MIRPDUs..

SUMMARY: decisions to make

- The One PNP option has the excess data problem. We can: a) eliminate it; or b) warn of the problem.

- We can document in the standard either:
  a) just the MP solution;
  b) just the CBP-only solution;
  c) both solutions;
  d) the MP solution, with the CBP-only solution described;
  e) the CBP-only solution, with the MP solution described.
  NOTE: There is no reason to make the specification so tight that, from outside the box, you can tell which solution is being used.

- Documenting the MP solution requires: a) describing the context identifiers, and b) specifying some CBP configuration selection method.

- Documenting the CBP-only solution requires defining the 8.5-like Y function (as in previous drafts).