802.1Qbp – ECMP Bridge Model 2/9/2012

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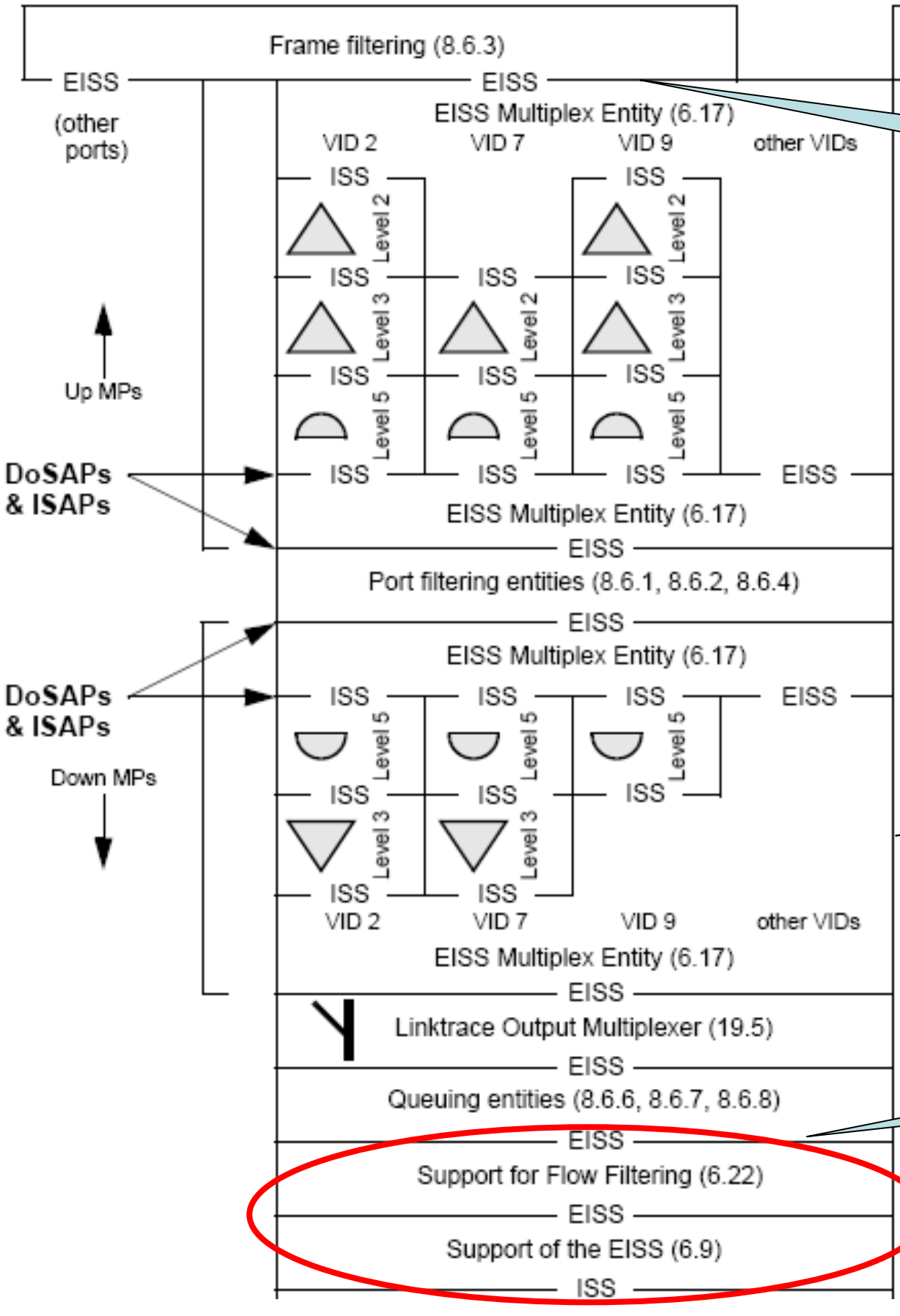
ECMP Model Discussion Points

- Service access point type: EISS or new FISS
- CFM/DDCFM extensions needed for ECMP
- Placement of Flow Filtering shim in “baggy pants leg”
  - Impact on first two points…

Do we need a new SAP type?

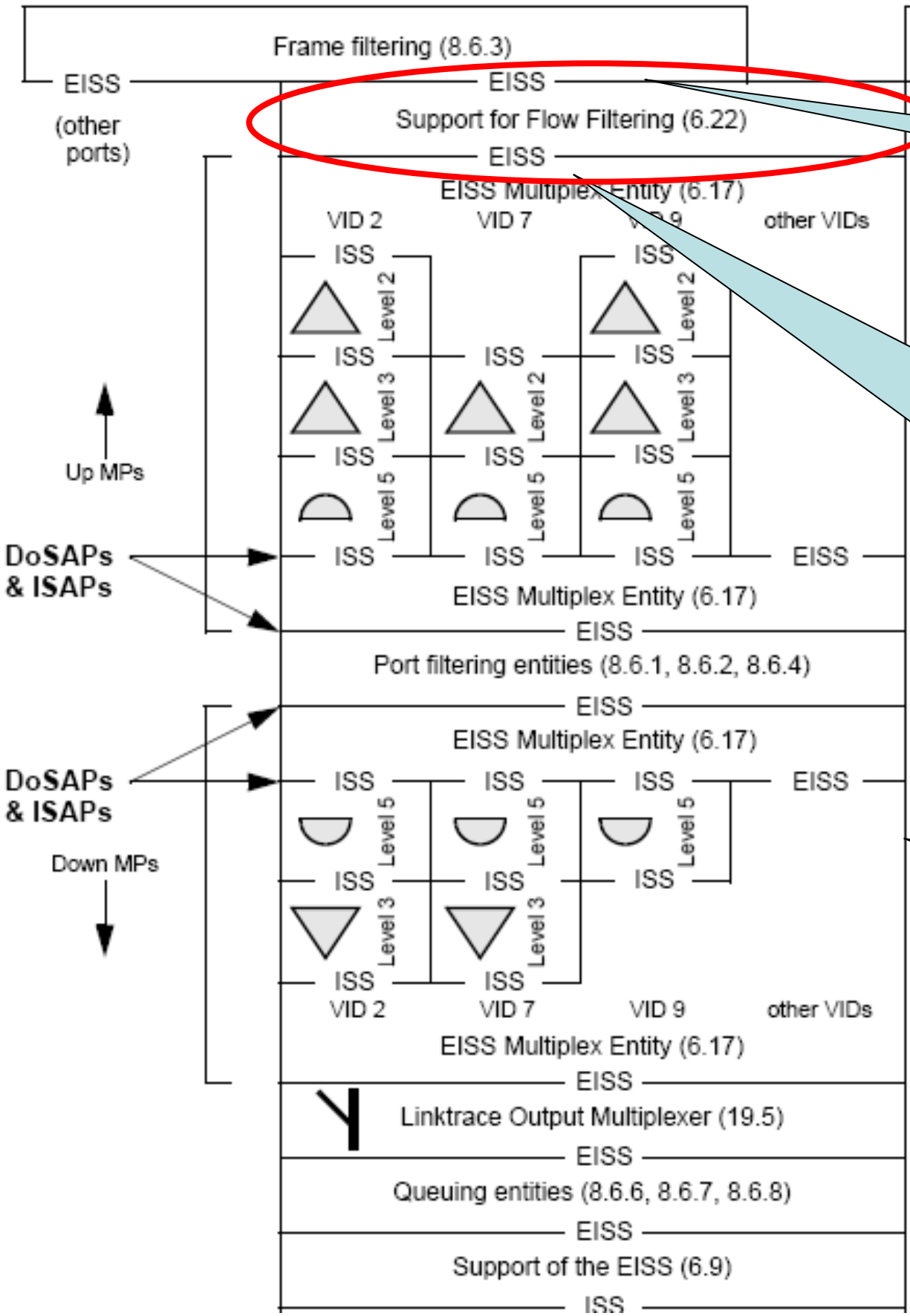
- Comment #47 on D0.1 suggests that the ECMP parameters be associated with a new service interface, e.g., an “F-ISS”
- Motivation:
  - The introduction, interpretation and usage of new parameters can be done by the introduction of a new service and the associated supporting function.
- Implications:
  - Each tag is associated with a service that builds (depends) on the service below and provides an enhanced service to clients above
  - May require new MP types or ISS/EISS/FISS MPs
  - May require new MEP placement – second pair of VID mux/demuxes



Not all VLANs use the enhanced service:
- **Use one SAP at the top or two?**
- **Use one Frame filtering function or two?**

FISS impact on shims and ISS:
- **Do all the shims above the tag processing need to be extended to support a new SAP type?**
- **It was agreed that this ISS did not have to include the new parameters; however, if MPs use ISS then there is no other way to pass new info up/down.**

Placing Flow Filtering shim with VLAN tag shim:
- **Keeps all tag processing together**
- **Could have used one tag to carry all info**



Not all VLANs use the enhanced service:
- **Use one SAP at the top or two?**
- **Use one Frame filtering function or two?**

Placing Flow Filtering shim at top:
- **New F-TAG info only affects Frame filtering**

No FISS impact on shims and ISS:
- **All the shims below the F-TAG processing can remain the same.**
- **ISS does not have to include the new parameters.**

Observations Regarding SAP type

- New SAP type may impact many shim definitions and figures
- New behavior is optional and is selectable per VLAN
- Not all ports may support the new behavior/information
- Other new behaviors have been added without creating new SAP type, e.g. Credit-based Shaper (but these did not add new parameters)
- Additional behaviors/information have existed in the past supported by the EISS, i.e. Routing Information (these did include additional information)
  - Similar to flow filtering information as it only affected frame filtering

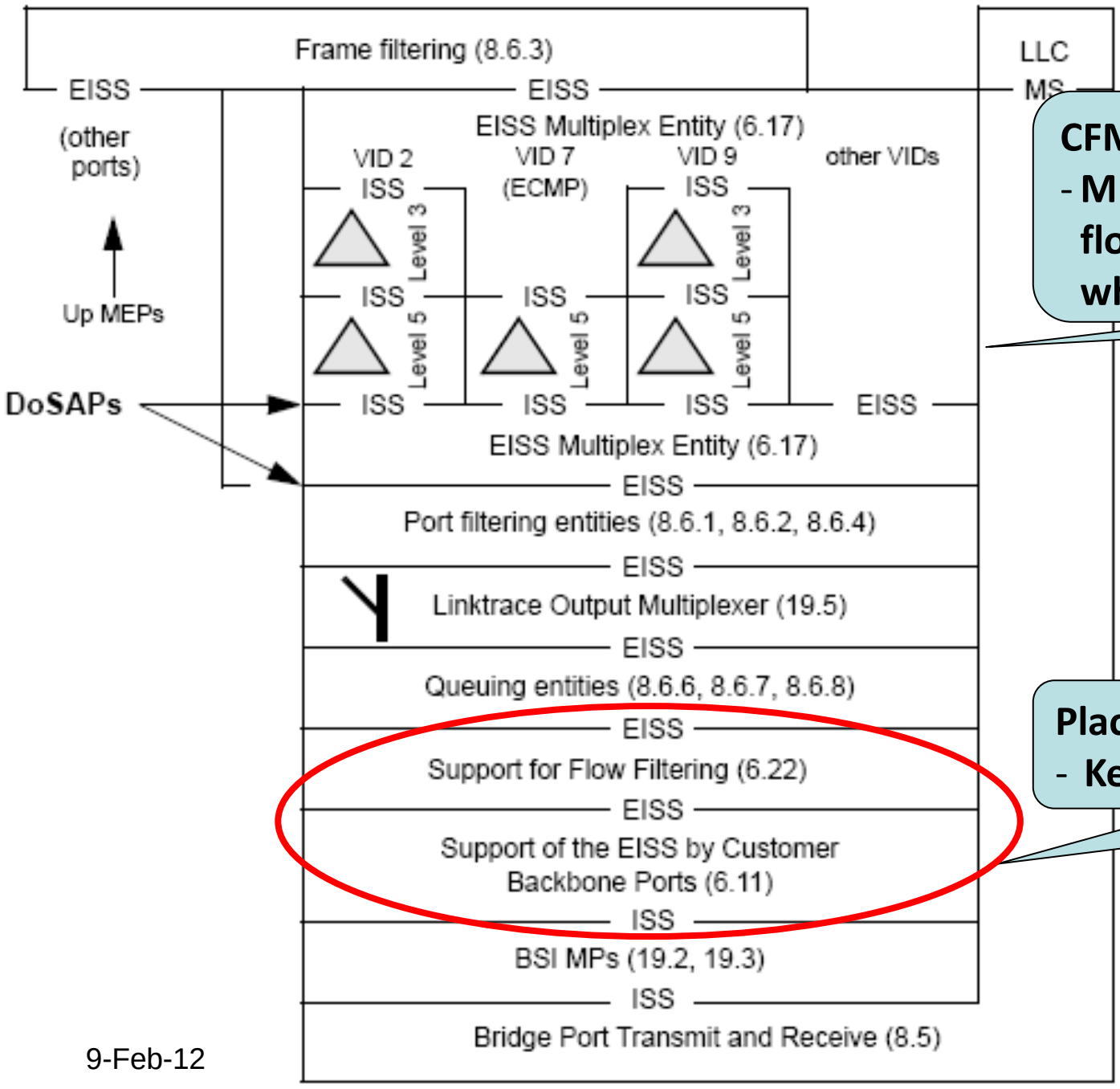
- Conclusion: A new SAP type may be defined but is not required.

What CFM/DDCFM extensions are needed?

- Comment #70 on D0.1:
  - Prior discussions and presentations on CFM for ECMP have covered flow-based, service-based, and network-based CFM, with the last two being covered using MEPs on I-SID. The text in this sub-clause is not consistent with prior discussions and there has not been any discussion in our meetings regarding this new model. How do we address service-based monitoring using this new model?
- Motivation:
  - In drafting D0.1 the editor did not have enough information about proposed CFM extensions. Discussion is required to clarify the needs and specific functional extensions.

Previous Discussion on CFM

- bp-sajassi-cfm-0711-v01.pdf
- Flow-Level CFM:
  - CFM functions performed on the user flows.
- Network-Level CFM:
  - CFM functions performed on a test “VLAN” that covers the network. Test flows are chosen to exercise all ECMPs for the Test VLAN.
- Service-Level CFM:
  - CFM functions performed on a service VLAN. Test flows are chosen to exercise all ECMPs for that VLAN. It can be considered as a special case of Network-Level CFM.

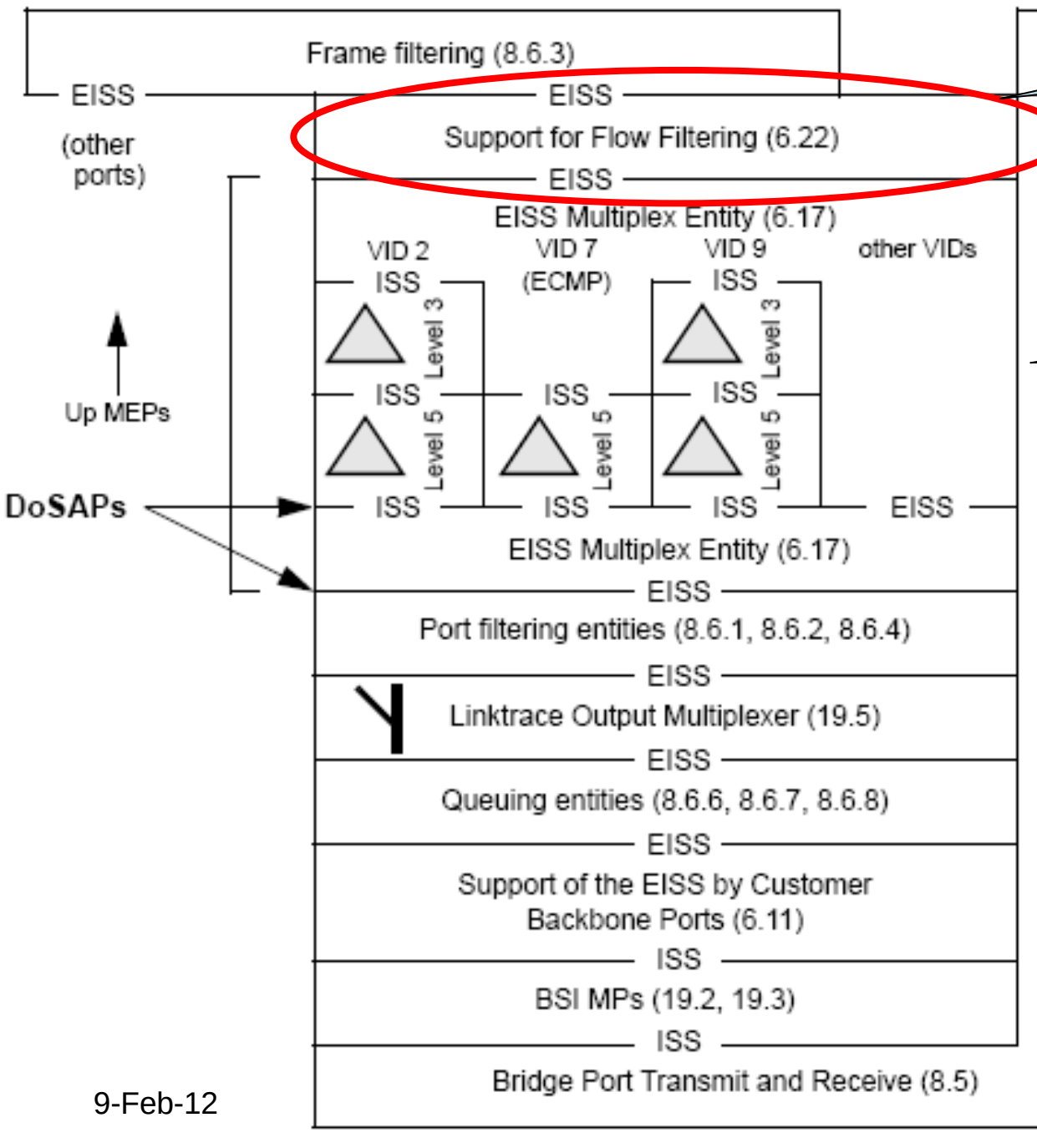


CFM impact:

- **MEPs generate CFM frames with or without flow_hash and time_to_live (depending on whether the VLAN is using ECMP).**

Placing Flow Filtering shim with CBP shim:

- **Keeps all tag processing together**



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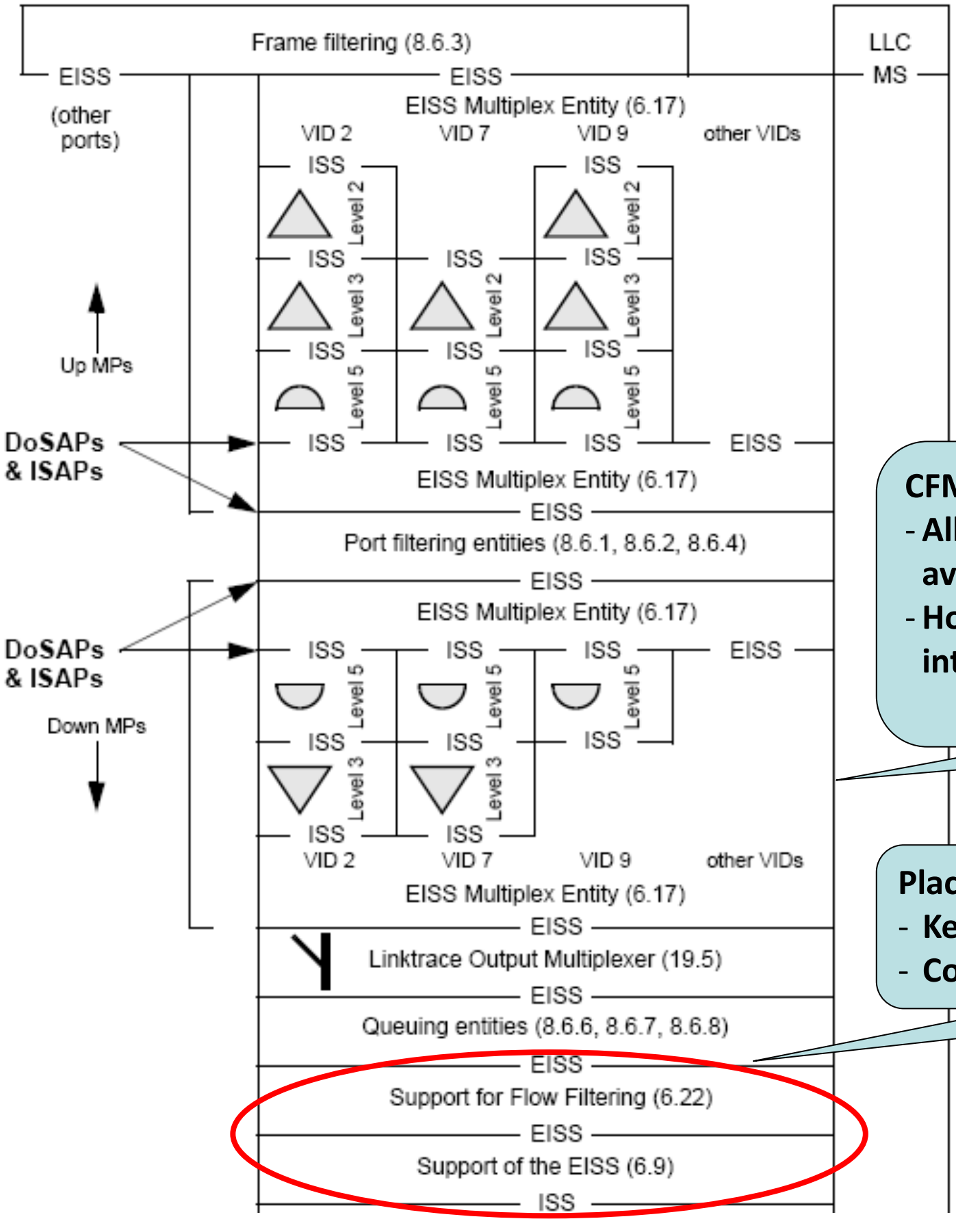
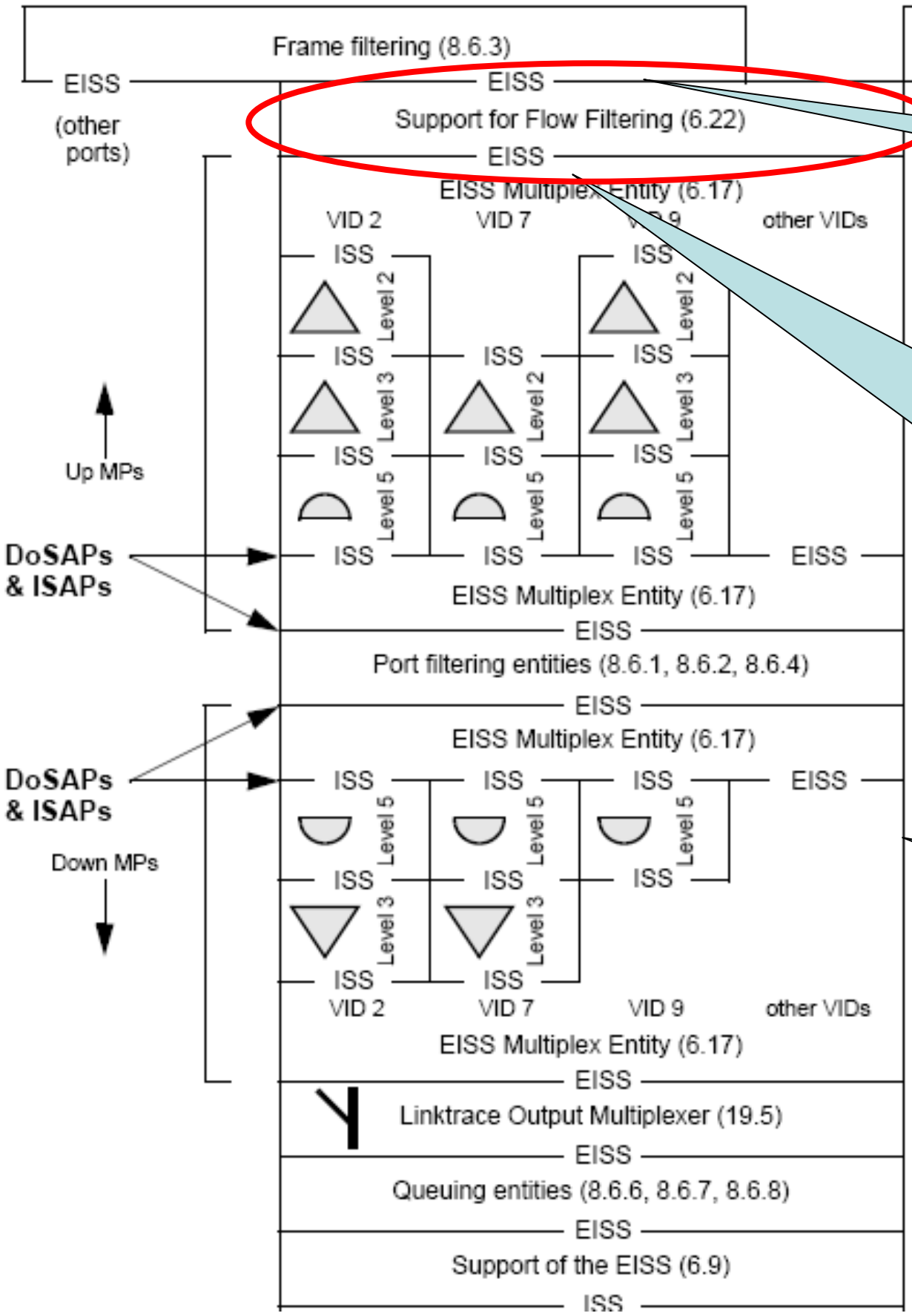


CFM impact:

- **All the MPs above the tag processing are available, i.e. the OAM EtherType is exposed;**
- **However, it is not clear what MEPs can do on intermediate ports in an ECMP VLAN.**

Placing Flow Filtering shim with VLAN tag shim:

- **Keeps all tag processing together**
- **Could have used one tag to carry all info**

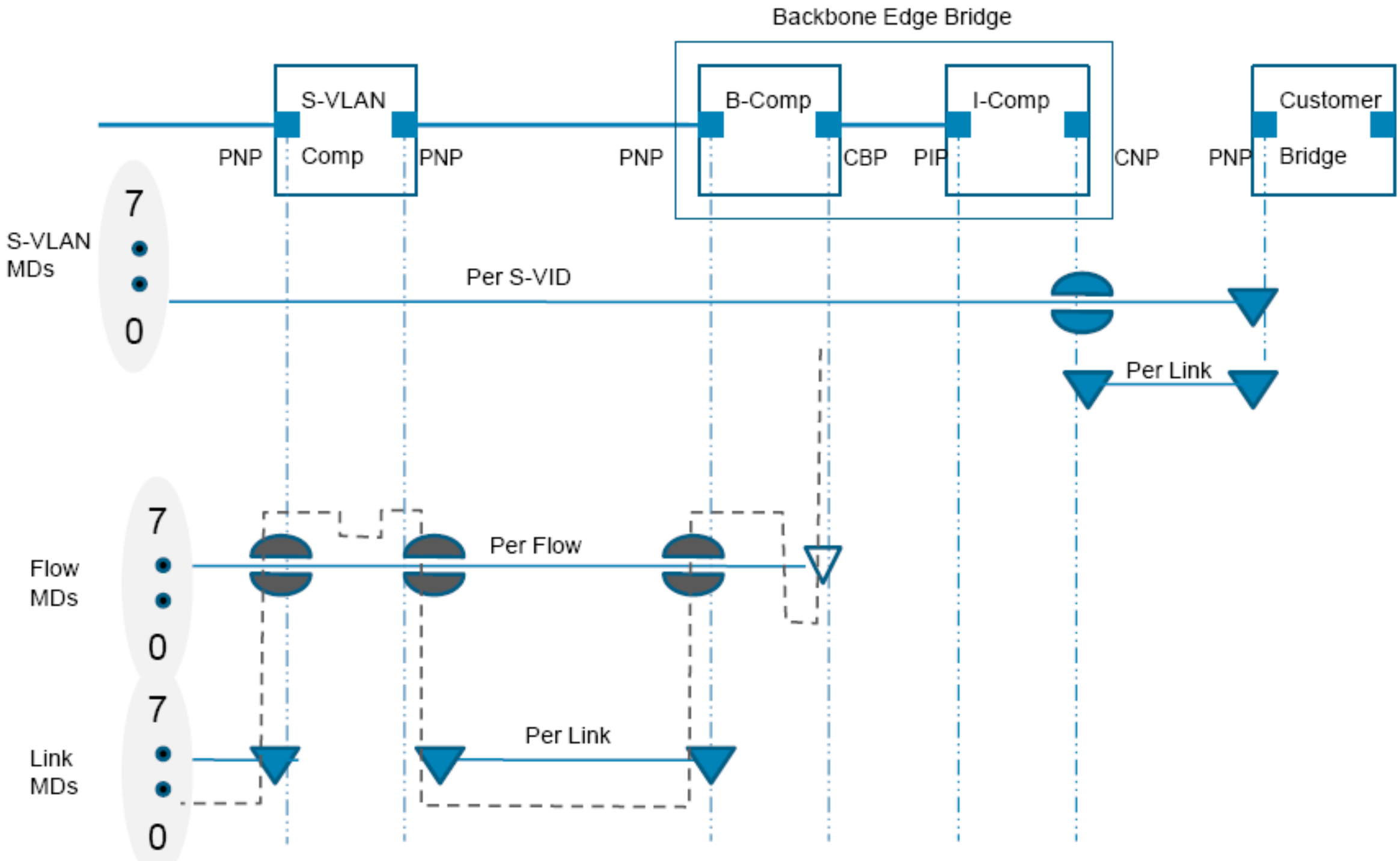


If we need new CFM functions on intermediate ports, do we need a new set of VID mux/demux and MPs? Flow Hash mux/demux?

Placing Flow Filtering shim at top:
- **New F-TAG info only affects Frame filtering**

CFM impact:
- **All the MPs on intermediate ports do not see CFM frames since the OAM EtherType is hidden by the F-TAG.**

Flow-Level CFM (from bp-sajassi-cfm-0711-v01.pdf)



- This looks like Network CFM, but
  - in the B-VLAN carrying the service
  - using DA and Flow Hash selected to cover service paths

Observations Regarding CFM

- ECMP VLANs only extend between CBPs
  - CFM coverage that would be equivalent to existing CFM is “Network CFM” in the B-VLAN, but covering ECMPs
  - Per flow CFM has not been defined for Bridging (and may not be in scope)
- Service level and Flow level CFM generated at BSI MEPs is problematic
  - Big extension to CFM function to generate frames that would hash to the same Flow Hash value as service frames
- Good news?
  - “Network CFM” may be sufficient – simply include necessary DA/Flow Hash pairs in Network CFM
  - DDCFM may be sufficient for intermediate points (this is what it was designed for!)