Proposed Relation Between PFC and the MAC Control Sublayer

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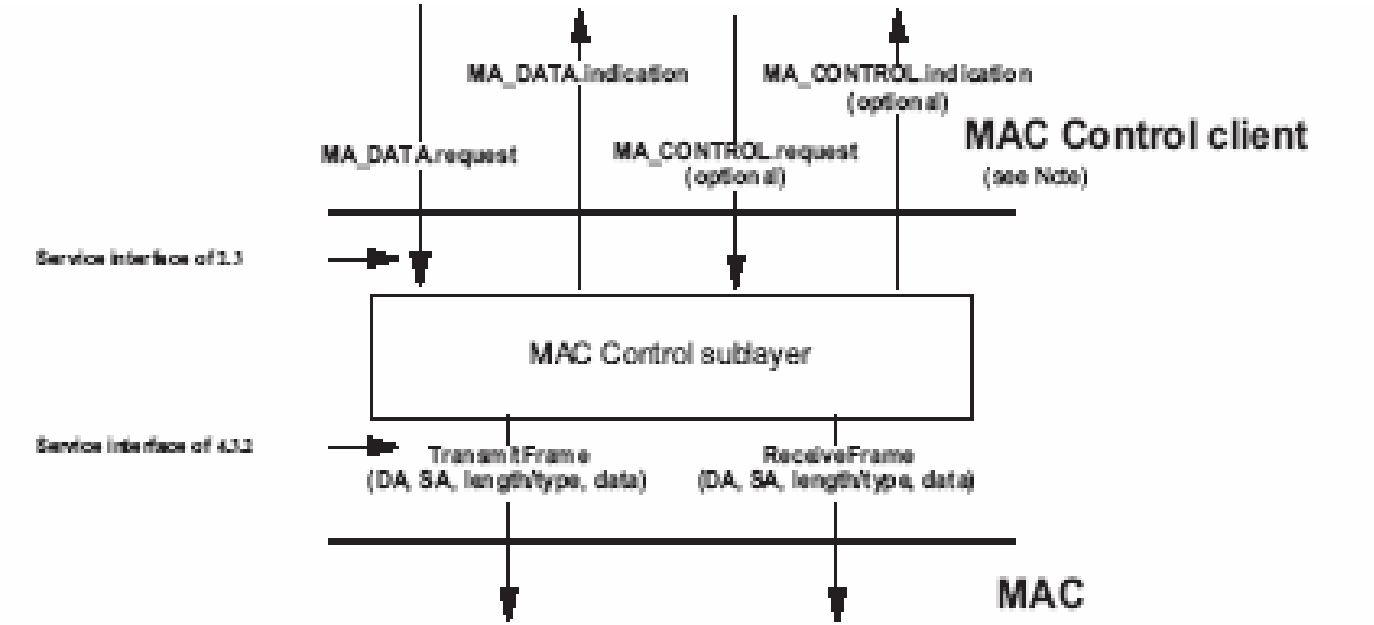
Agenda

- Background
- Observations of the MAC Control sublayer
- Support for non 802.3 MACs
- Recommendations

Background

- **The MAC Control sublayer is defined in clause 31 of 802.3**



Excerpts from clause 31.3

- Clients of the MAC Control sublayer may generate either MA_CONTROL.request or MA_DATA.request primitives.

  MA_CONTROL.request primitives generated by MAC Control clients are interpreted by the MAC Control sublayer, and may result in the generation of TransmitFrame function calls to the MAC sublayer, or other actions as necessary to support the requested MAC Control sublayer function.

- The MAC Client could use MA_Control.requests to ask the MAC Control sublayer to generate PFC pause frames

  Similar to PAUSE today

  Pause frames are generated at the request of the MAC Client

What is a MAC Control Client Anyway

- **From clause 31.2: “**MAC Control clients may include the Bridge Relay Entity, LLC, or other applications.”

  This would seem to conver the entity that knows when flow control for a particular priority should be asserted

More from 31.3:

- If the [validly received] frame is destined for the MAC Control sublayer entity, it is interpreted and acted on internal to the MAC Control sublayer.

  This may result in state changes within the MAC Control sublayer, *the generation of MA_CONTROL.indication primitives*, or other actions as necessary to support the MAC Control sublayer function. [emphasis added]

- The MAC Control sublayer could interpret received PFC frames, execute a state machine, and pass an indication of the PFC pause state to the MAC Client

  Pause does that today

  With PAUSE, the MAC Control actually halts transmission of frames if PAUSEd. We do not want this in PFC to prevent HOL blocking

  The MAC Client can take care of it based on the indication

Observations

- **PFC seems to cleanly layer above the MAC Control sublayer as was intended by the MAC Control architecture**

  The operation we need for PFC is similar to what is done in PAUSE:

  Execute a receive and transmit state machine

  Generate PFC frames based and control the state machines based on MA_CONTROL.requests

  Generate MA_CONTROL.indications based on the states of the state machine

  Unlike PAUSE: transparently pass the MA_DATA.requests and indications

What about non .3 MACs?

- **We are defining a bridge spec, so we need to cover them**
  - **But we only care about full-duplex MACs**
  - **We may care only about those that support ETS**
  - **We want to discourage the use of PFC outside the data center**
  - **We might be less concern about MACs pending obsolescence**
    - And those with no significant deployment
- **Does this leave a null set?**
- **Clearly, while support is required for all full-duplex (potentially ETS supporting) MACs, we should optimize for 802.3**

How do we support all relevant MACs…

- **And optimize for 802.3?**
  - **Re-use 802.3 MAC Control**
  - **Create a “MAC Control Proxy” sublayer Annex**
    - Part of 802.1 architecture
    - Goes at the bottom of “our” stack
    - Applies only to MACs that do not have a native MAC control
    - Uses same group address and Ethertype
  - **Specification of this sublayer is simple**
    - Essentially a merger of clause 31 and 31B written specific to PFC
      - Would only be a small number of pages

Recommendations

- **Generate an Annex that describes the use of the MAC Control sublayer for PFC**

  Implies use of the MAC Control Group Address: 01-80-C2-00-00-01

  Similar to 802.3 Annex 31B

  What about the Type Field?

  From 31.4.1.3: "**The Length/Type field of a MAC Control frame is a 2-octet field that shall contain the hexadecimal value: 88-08"**

- Create an MAC Control Proxy Annex to cover the other MACs (which will probably never be implemented).

Thank You