

Possible structuring of ResE services

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Agenda

- What goes where?
- What services are needed
- All services in MAC?
- All services above MAC?
- Conclusions

*Note: this is a very preliminary proposal!
As an outsider to 802 since 1983, I have a
relatively naïve idea of how things might
be done.*

Assumptions

- Objectives list from September 2004 interim ResE SG and subsequent informal meetings in San Jose
 - fully backwards compatible with 802.3 and higher layers
 - all existing PHYs supported that are at least 100Mb/s and full duplex
 - add precise synchronization, admission controls, and low latency isochronous services based on 8kHz cycles
 - no topology restrictions beyond what is required for 802.1D spanning tree bridges
- General approach as outlined in my presentation at the September 2004 ResE SG
 - http://grouper.ieee.org/groups/802/3/re_study/public/sep04/teener_2_0904.pdf

What services are needed

- **Global precise synchronization**
 - “house clock”
- **Admission controls**
 - management of resources
- **Low latency isochronous transport**
 - schedule packet for transmit during particular isoch period (“cycle”)

Synchronization services for client

- **Clock synchronization direction control**
 - from/to network
- **Clock to network**
- **Clock from network**
 - higher level scheduling of services
 - need to know current time to know when in the future an event can be scheduled
 - time stamping of streaming data

Synchronization in bridge

- **protocol to select master clock in network**
 - **if no bridge, just uses “highest” MAC address**
- **accept clock from port connected to network master**
- **forward clock to other ports**

Admission controls for client

- **Request channel number**
 - Multicast address to use as SA
- **Release channel number**
- **Request bandwidth from path to talker**
 - bytes/cycle ... makes reservation in output queue of talker (and all output queues in path from talker)
 - talker address is channel (multicast address)
- **Release bandwidth from path to talker**
- **Accept bandwidth request from listener**
 - bytes/cycle ... makes reservation in output queue of self, if no resources, tags request
- **Respond to bandwidth request from listener**
 - sent to listener that made request
- **Accept bandwidth response from talker**
- **Release local bandwidth reservation**

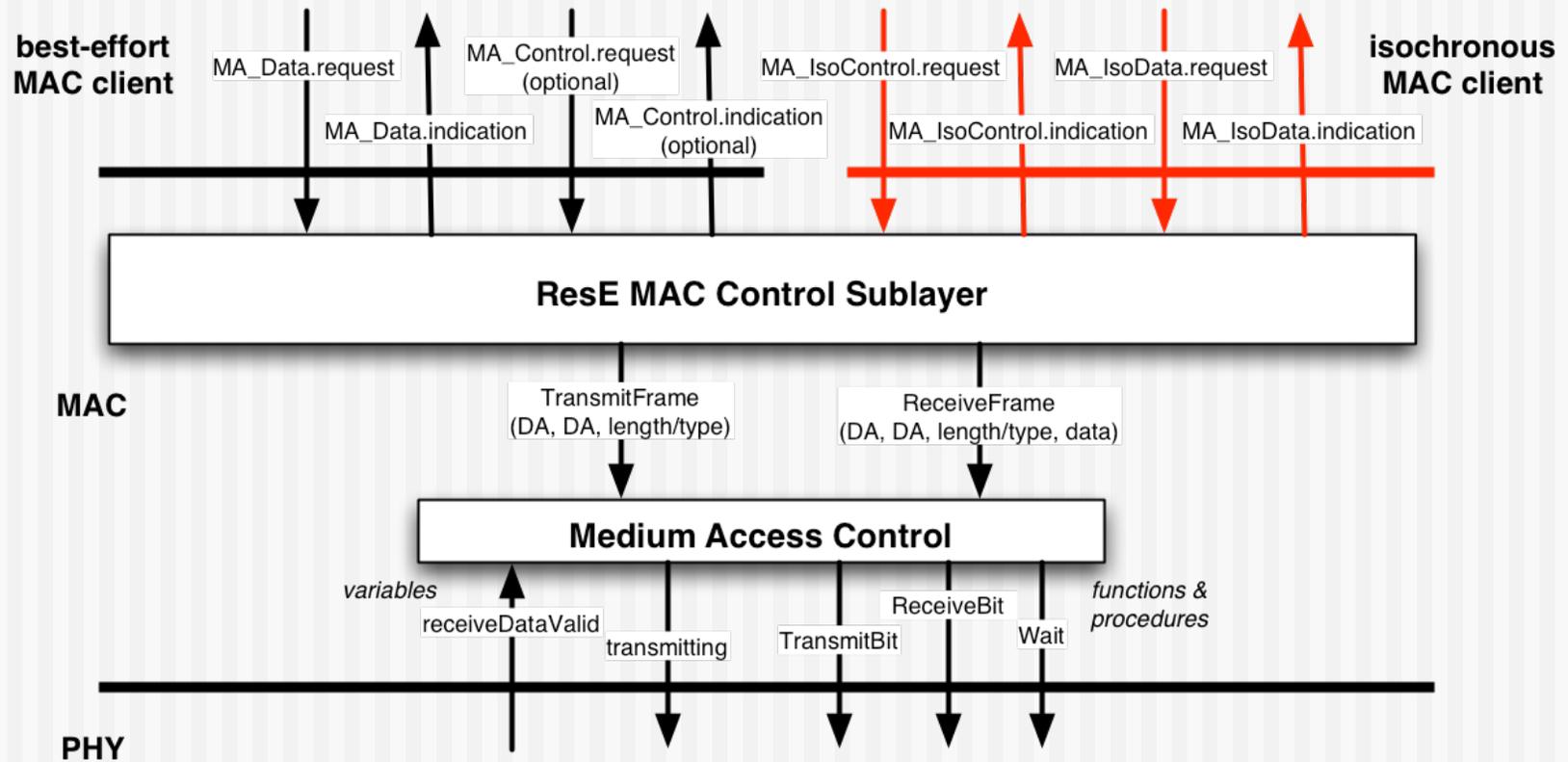
Admission controls in bridge

- allocate channel using GMRP?
- forward bandwidth requests to talker if first request
 - respond directly without forwarding if already routing channel
- forward bandwidth responses to listener

Isochronous transport

- Request transmit of isochronous packet
 - DA, SA, data, cycle “n”
- Receive isochronous packet
 - DA, SA, data, cycle “n”

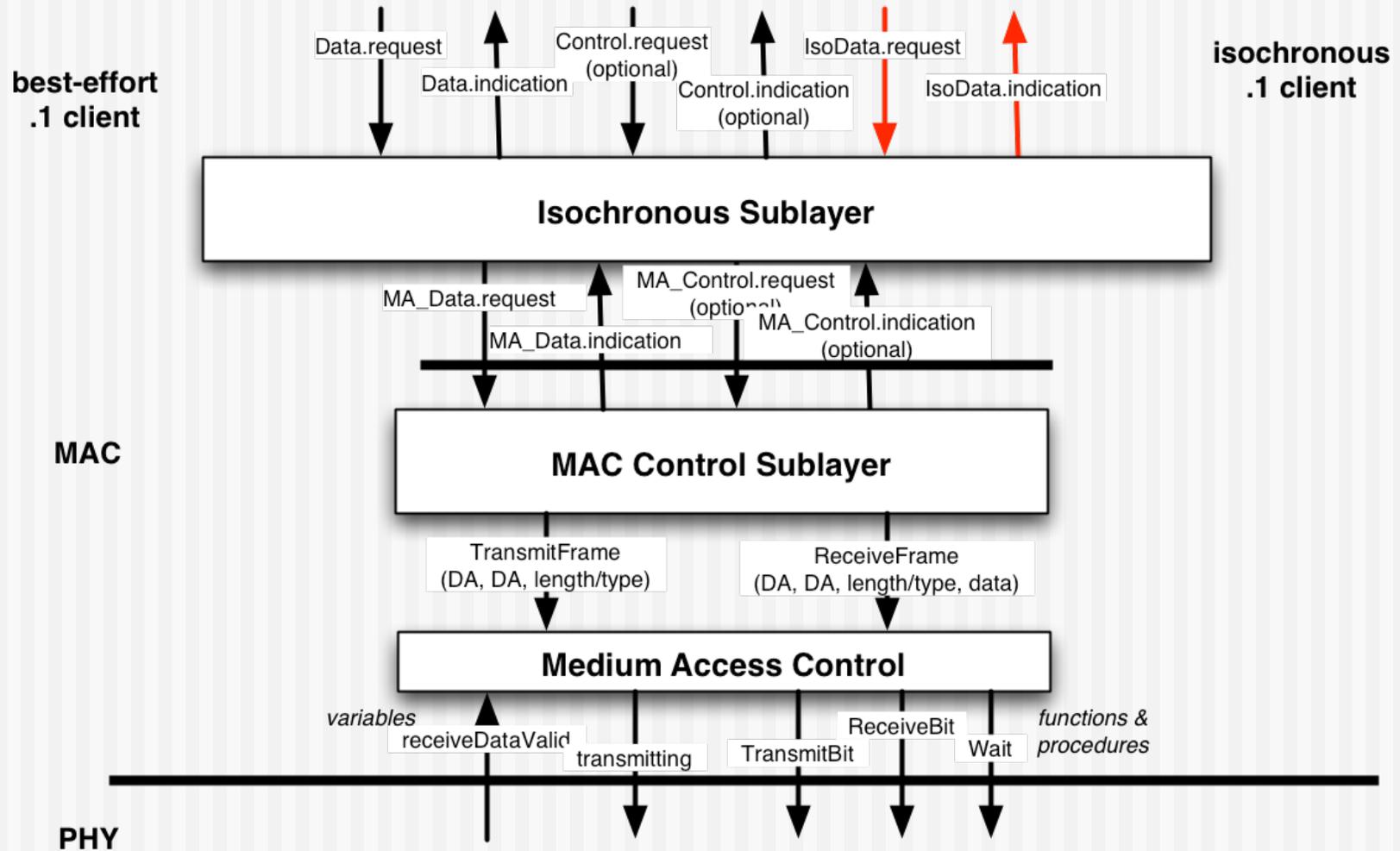
All services in MAC?



MAC-based services

- **Advantages:**
 - All best-effort services/protocol stack unchanged
 - New services totally in parallel
 - Close to implementation model
- **Problems**
 - reinvent registration and control services that may already be defined (e.g., GARP-based services)

All services above MAC?



Bridge-based services

■ Advantages

- may be easier to specify
- queues and scheduling concepts already in 802.1D
- GARP services may be a good match for admission control protocols

■ Disadvantages

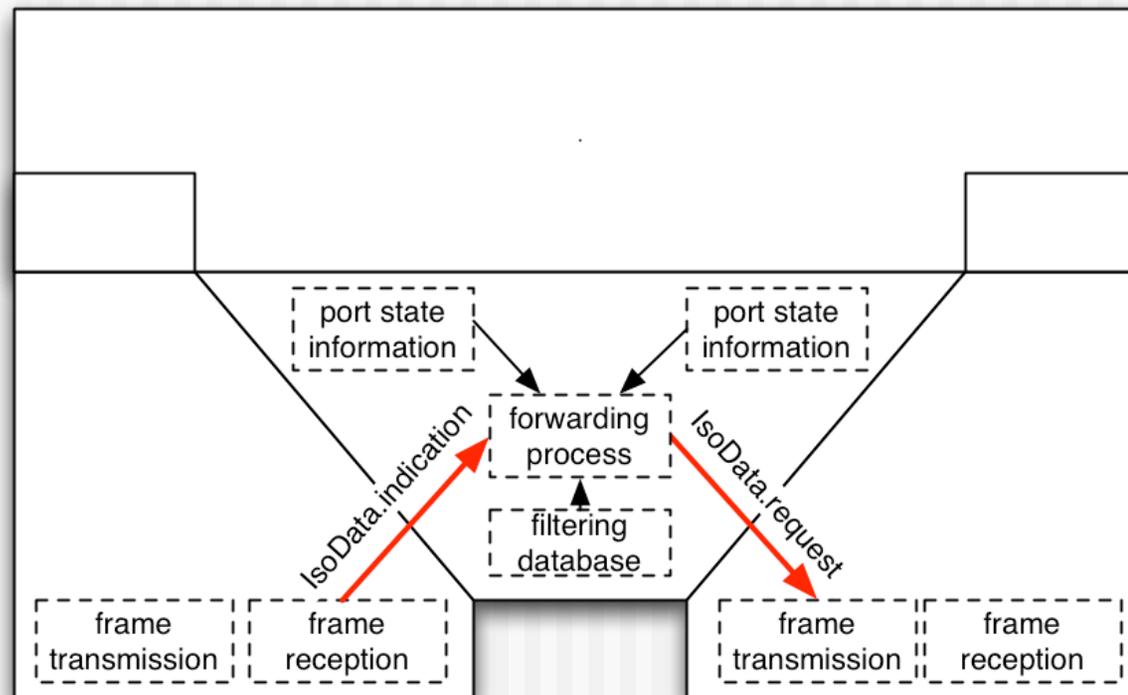
- non-bridge devices need many of the services as well
- will need better clarity for implementers

How about a combination?

- put admission control services into 802.1D
- put isochronous transport services into 802.3
- share synchronization services

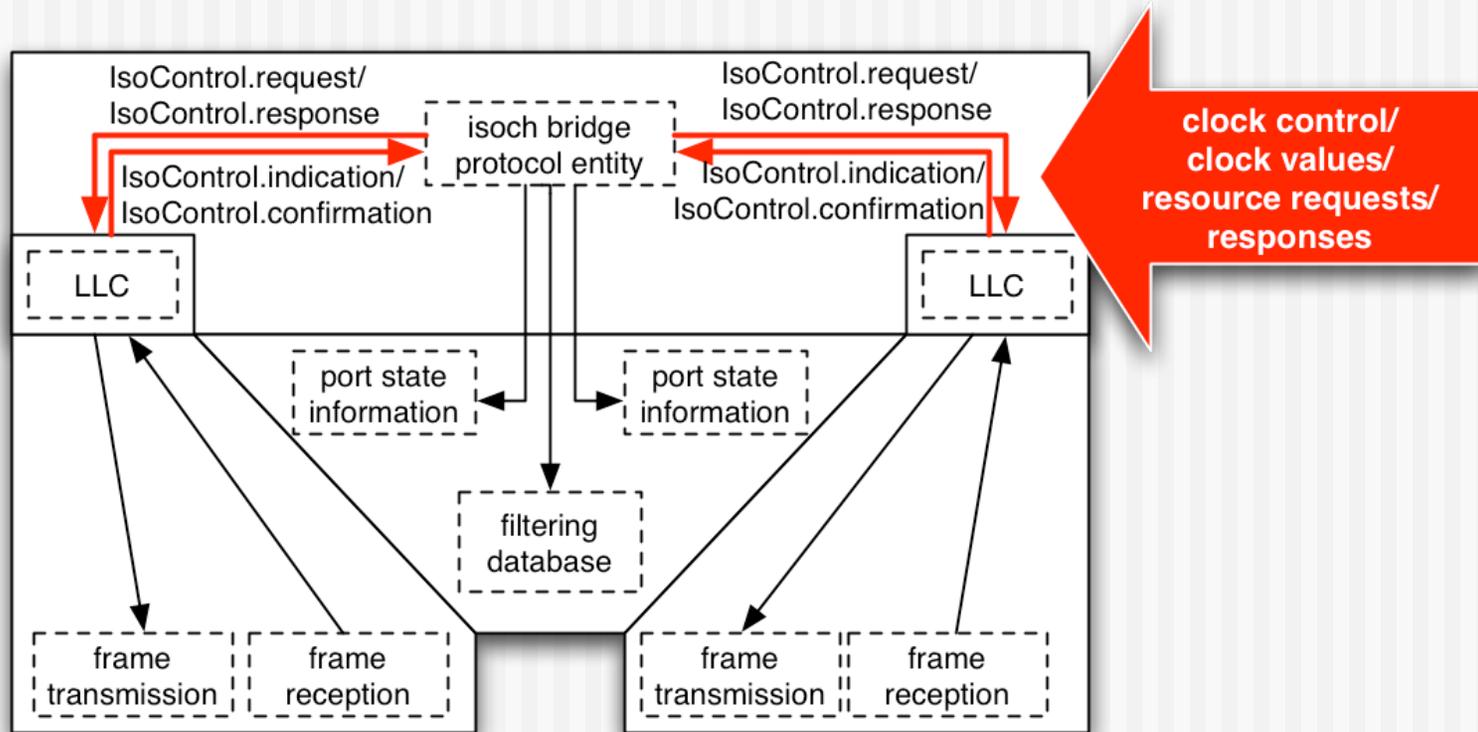
Isochronous frame relay

- in parallel with best-effort frame relay



ResE inter-bridge protocol

- in parallel with best-effort bridge protocols



Thank you!
