CMSG Problem Statement:
Where we started and where we are..

- Borrowing some of Bob Grow's foils from interim meeting:
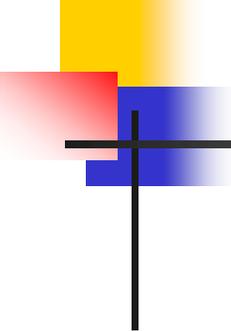
General Congestion types

- ## Transitory congestion
    - Traffic can be smoothed over time, without packet drop, because average BW demand is less than capacity and peak demand can be buffered

- ## Oversubscription
    - Traffic which can't be smoothed over time, can results in either not being admitted in the network (e.g. admission control) or either results in frame drop (e.g. buffer overflow, RED), or back-up into source buffers
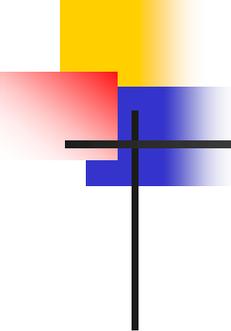
Solutions Spaces

- Transitory congestion
  - Differentiated Service (priorities)
  - Can provide preferential treatment to higher priority traffic
  - Discussion shows that some in the group believe that .1p addresses this. (Some standard specification of "draining" mechanisms may be helpful..) The MAC Service interface though does not support priority queueing.
  - Many NICs do not implement priorities because they are specified only for bridging.
- Oversubscription
  - Rate limiting can help reducing packet drops in this scenario
  - Can improve latency and latency jitter (not building up buffers, not requiring TCP to resort to retransmit etc.)
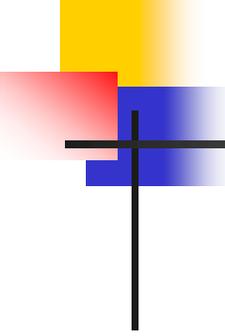
Problem Space

Dropped packets within a single oversubscribed Ethernet bridged network produce significant latency problems for messaging and storage traffic that can not be readily resolved at layer 3 or 4.

PAUSE was originally developed as a means of backpressuring link traffic to an input buffered switch. The use of PAUSE for congestion management has a detrimental affect on latency and it results in simply moving the congestion point away from the actual location.

A method of limiting network traffic on the oversubscribed link by allocating, rationing, or limiting bandwidth from sources or upstream links is needed.
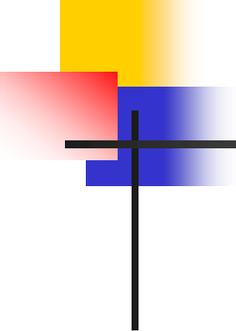
Narrowed Problem Statement - Strawman Proposal

- 802.3 MAC Clients need to be able to limit traffic being received from its peer to avoid congestion due to oversubscription
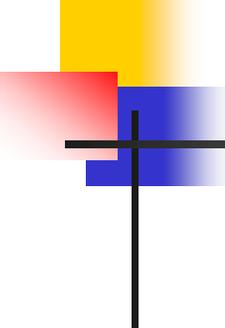
Supporting Objectives

- Focus solution to a single link only (hop-to-hop/end-to-end not specified)
- Specify a mechanism to limit the rate of transmitted data using a "pacing" algorithm (not a burst duty cycle)
- Specify the granularity of the rate limiter
- Specify a new MAC Control Opcode and parameter set to support exchange of rate control information
- Do not specify how the MAC Client generates these MA_CONTROL.requests nor how it responds to the reception of MA_CONTROL.indications
- Specify the response to the new MAC Control opcode's parameter set
- Work with other 802.3 activities on the "long standing inconsistency" between MA_DATA.requests and transmit_frame function call
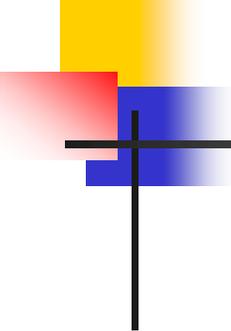
Question 1

1. Specify a mechanism within the MAC Control sublayer to limit the rate of transmitted data using a "pacing" algorithm (not a burst duty cycle)

    1. 5 in favor

2. Specify a mechanism to limit the rate of transmitted data using a "pacing" algorithm (not a burst duty cycle)

    1. 11 in favor
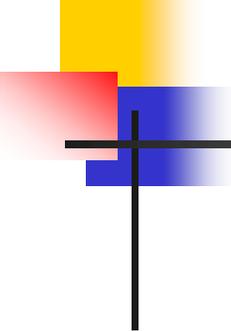
Question 2

1. Specify how the new MAC Control opcode's parameter set modifies the rate limiter
   1. 1 in favor
2. Specify how the MAC Control sublayer responds to the reception of the new opcode's parameter set
   1. 0 in favor
3. Specify the response to the new MAC Control opcode's parameter set
   1. 11 in favor