

802.1Qau Design Criteria Thoughts

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Introduction



- The group has made some good progress in proposing different schemes.
- To properly evaluate the schemes and make an educated selection, we need to agree on a prioritized list of requirements and optional criteria upon which to evaluate different proposals.

Suggested prioritized list of criteria



1. Mechanism can be implemented using existing network processors
2. Per flow queuing and state is not required in bridges
3. Avoids frame loss
4. Compatible with TCP/IP based protocols
5. Support a bandwidth delay product of at least 1 Mbit, preferably 5 Mbit
6. Maximize link utilization
7. Minimize control overhead
8. Resilient to loss of congestion notifications
9. Allow for coexistence of multiple congestion-managed classes of service
10. Forward looking to a more generic Ethernet flow control for non-real-time Ethernet services
11. Fast convergence to fair share when new source provisioned (definition of *fast* and *fair share* need to be agreed upon)
12. Fast convergence to fair share when existing source starts transmitting burst
13. Mechanism scales to large flows and hops
14. Fair with different flows having different propagation delay

Learning from history...



ABR specification	Issue	Ethernet flow control
Requirement to support multiple modes of operation	Source behavior and nodal behavior extremely complex/ costly to implement Interaction between different modes within network created uncertain behavior	Single mode of operation.
Binary mode	Inefficient because of single bit notification Required to loop to the end destination before returning to the source (long control loop + need to handle possibility of losing packet) Large overhead due to small size of cells Source behavior very complex	Use mechanisms consistent with existing hardware capabilities. Allow for BECN operation to reduce delay and probability of loss of control message
Explicit mode	EXTREMELY complex/costly to implement in the queuing point. Required ability to calculate the fair share of bandwidth for each connection at any instant and send that back to the source. Required to keep state information for each flow.	Multi-level feedback can provide more than adequate performance.
Ease of Management	ABR required (several) new traffic parameters different from existing service offerings (e.g. VBR).	The RP needs to use well known provisioning parameters (CIR/CBS/EIR/EBS).