

Bandwidth Allocations in the P802.17 MAC

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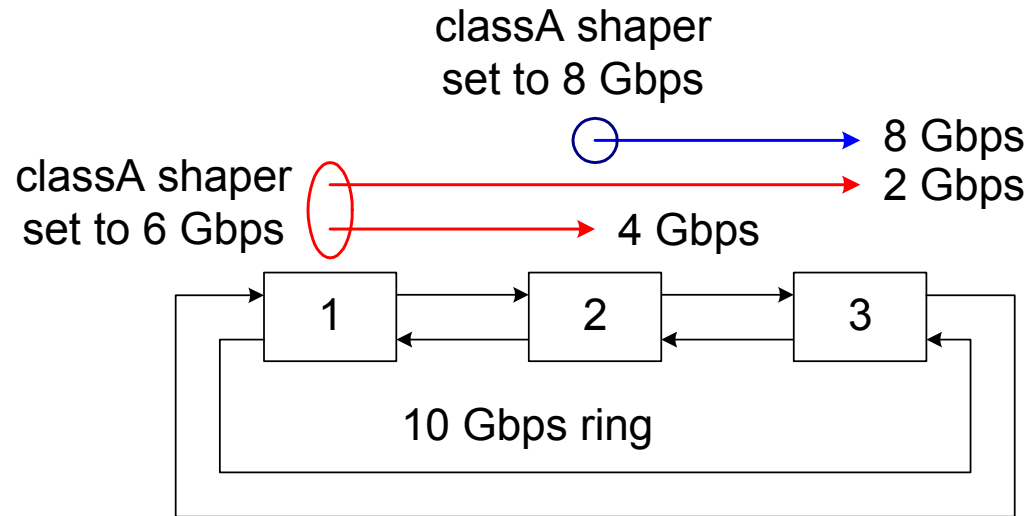
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Motivation

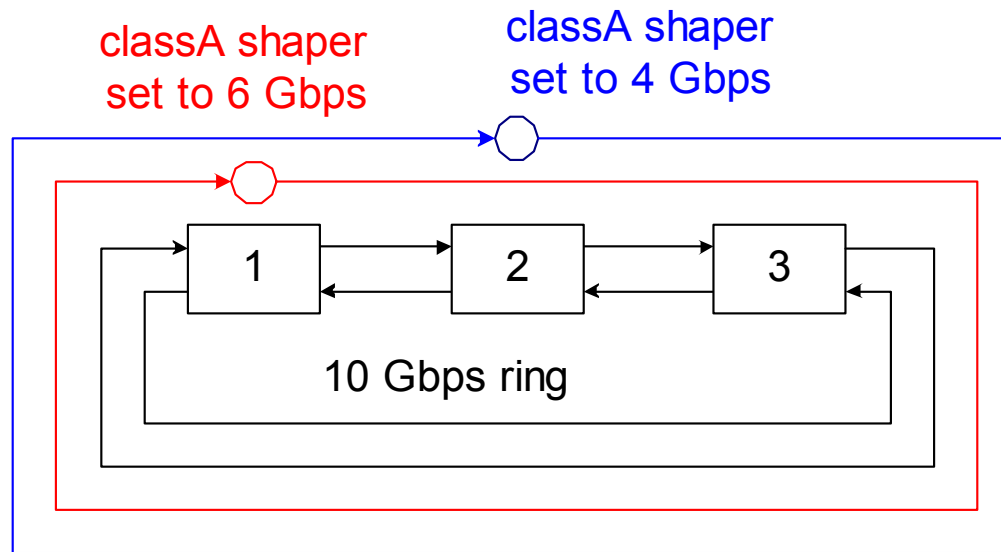
- The draft is currently unclear about whether allocations are done uniformly or spatially
 - The datapath clause supports only a single shaper per ringlet for each of the allocated service classes
 - The introduction and topology clauses suggest that bandwidth can be spatially allocated
- With a single shaper per class per ringlet, spatial service contracts cannot be enforced

Spatial Bandwidth Provisioning



- Allocation: Node 1 allocates 4 Gbps to Node 2 and 2 Gbps to Node 3
- Enforcement: Node 1 must set its shaper to 6 Gbps
- Issues:
 - What happens if the client at Node 1 sends 6 Gbps of multicast traffic?
 - Node 2 cannot insert 8 Gbps as it thought it could
 - The RPR MAC has no way to enforce a spatial provisioning contract

Uniform Bandwidth Provisioning



- Allocation:
 - Node 1 allocates 6 Gbps and is shaped to that
 - Node 2 is limited to allocating 4 Gbps, at least for classA0
- Enforcement:
 - Node 1 can send 4 Gbps to Node 2 and 2 Gbps to Node 3, or any distribution it wishes
- Issues:
 - There is no way to allow spatial reuse via allocation, only reclamation

How Can We Address the Issue?

1. Require the MAC or higher layers to enforce spatiality of traffic according to allocations through non-standardized means
 - + Little change to the standard
 - Requires intelligent client
 - Standards are usually not allowed to rely on non-standardized behavior
2. Introduce per-destination shapers to enforce spatial provisioning
 - + Provides full spatial reuse
 - + Provides bandwidth/delay/jitter guarantees
 - Introduces added complexity (in both MAC and client)
 - Delays standardization of P802.17
3. Limit this version of the standard to only uniform allocation
 - + Fairly easy to implement
 - + Provides bandwidth/delay/jitter guarantees
 - Unused allocated BW can be reclaimed only by fairness eligible traffic
 - Unused classA0 BW can not be spatially reused at all

Option #3 seems to be the best choice

Summary

- For the first version of 802.17, allow for only uniform per-node allocations of bandwidth
- Comments 100 & 235 propose the following:
 - Remove references to spatial provisioning
 - State that the only model supported by the RPR MAC is uniform provisioning
- Also recommend modifying comment 235 to grant editorial license to the respective editors to update P802.17 to reflect this throughout the standard