Network Architecture and Ring Aggregation

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802.17 Baseline

- Simplicity has helped make Ethernet successful
  - We need to keep that in mind as we define .17
- A ring is composed of two counter-rotating ringlets
- Each node on the ring is independent of other nodes
  - Local free running oscillators
    - Allow line timing on SONET/SDH interface
    - No need to pass clocks or build a synchronization network

Link Aggregation

- 802.3ae defines a method for grouping separate MACs into a single logical MAC that has greater capacity

- Each MAC is still independent in terms of clocking etc

  - Distributer and Collector functions are defined by specifying behaviors and not implementations

  - The important behavior is that conversation packet orders are preserved

   - within a source/dest pair and priority

Link Aggregation in a Ring

- Taking 802.3ae and applying on a Link basis is similar to a ring of Ethernet switches
  - Ability to arbitrarily switch packets from one ringlet to another at each node requires a switch between the MACs
    - Overly complex and is outside of scope of 802.17MAC
- Apply 802.3ae rules to each entire ring
  - Consider the ring as the "link" in 802.3ae terms
- Outside of the scope of work for this standard

Ring Aggregation

- ## When is Ring Aggregation needed
  - Initial build out of ring at some capacity
  - A to C links always congested
    - Add additional capacity to A-C
   - No need to upgrade entire ring
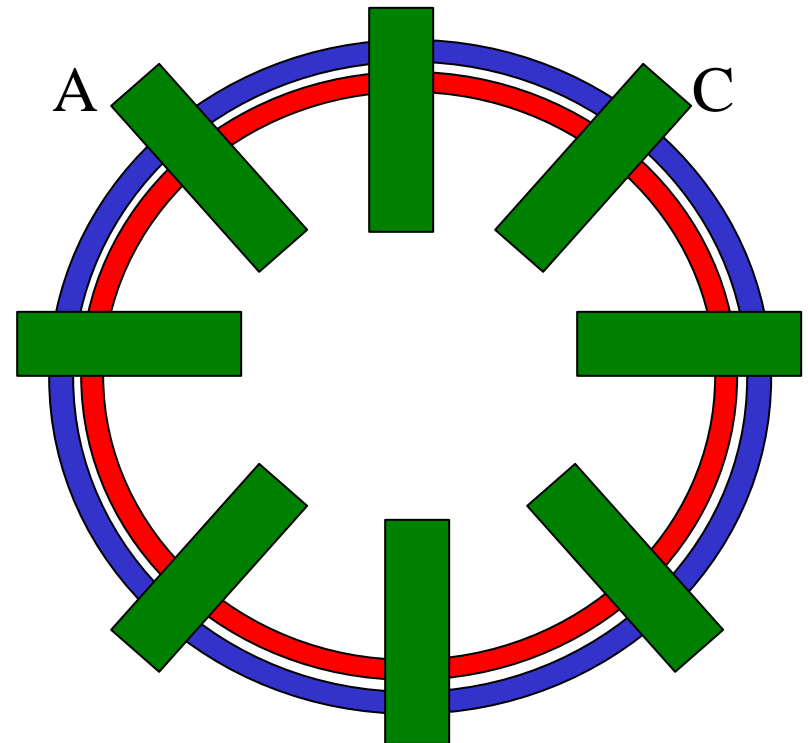
Ring Aggregation

- If links A-B and B-C were most congested
  - then some percentage of traffic between A-B, A-C and B-C should be moved to the second ring
  - Use rules similar to 802.3ae to distribute traffic
  - Note 802.3ae defines behaviors and not mechanisms
  - Independent Operation of rings
    - Keeps the MACs simple
    - No change to behavior of other nodes on the original ring
    - Changes only to the distributor and collector functions on A, B and C
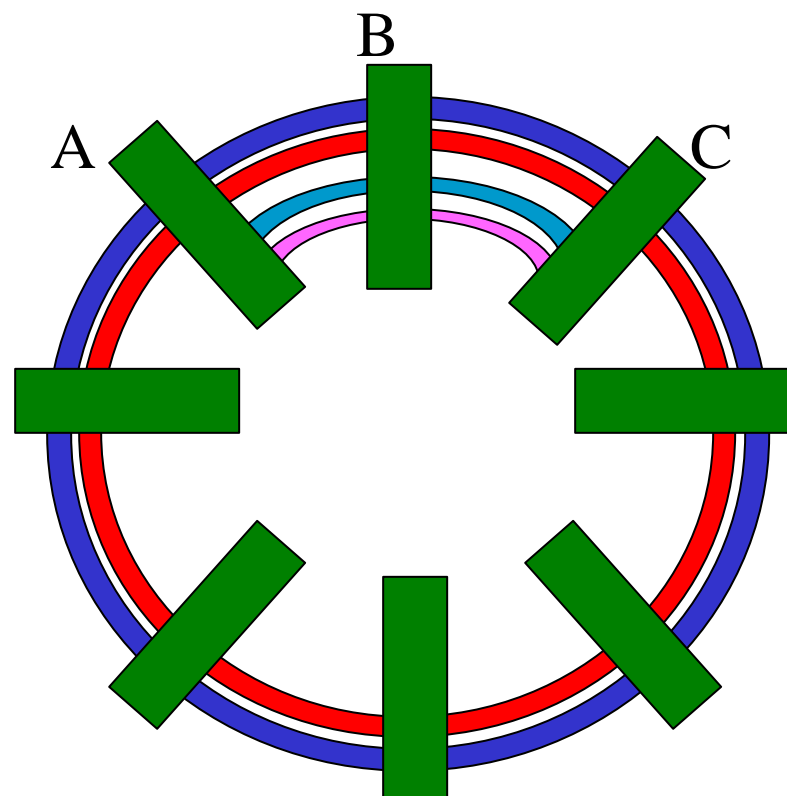
Ring Aggregation

- Eventually, the second ring can be congruent to the first ring
  - No change needed to distribution rules
  - Larger opportunity to spread traffic
    - Can use different rules
      - Source / destination pairs
      - Priority I.E. separate traffic classes

A   C
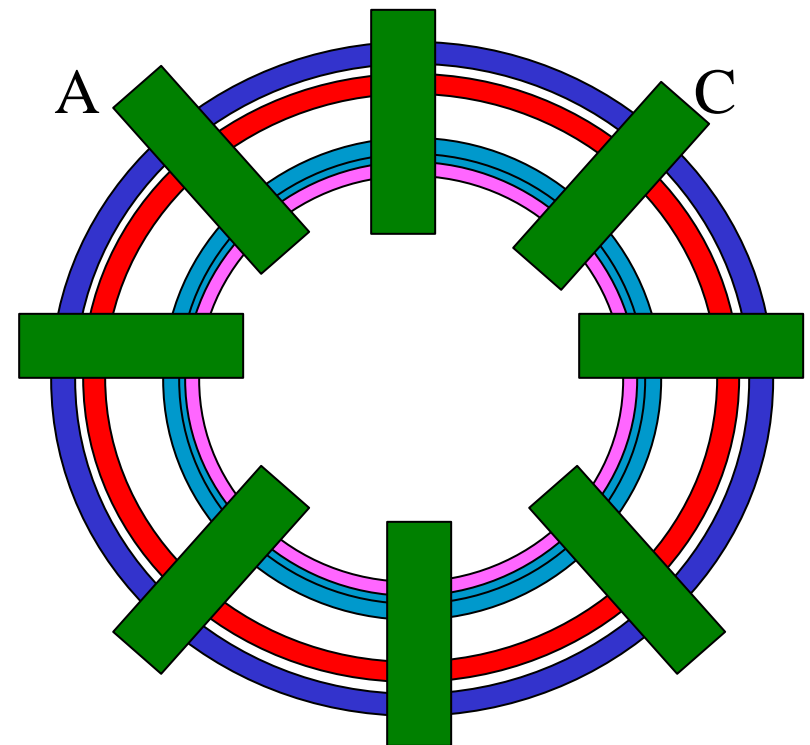
Conclusions

- Ring Aggregation is a reasonable extension to Link Aggregation that will scale well

- Few if any changes needed to base MAC

  – Complexities are in the distributor and collector functions

  – We can start this standard once 802.17 is well underway