

# Fairness and RPR

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# Fairness Criteria

- The MAC is responsible for supporting “fair” access to media
- Fair allocation of bandwidth is “proportional” or “weighted”
  - Subscribers can expect to get a fair proportion of “available” bandwidth
  - Available BW can be fairly distributed among SLAs
- Fair access to the ring
  - Access delays experienced by each subscriber is bounded and is node location independent

# Efficiency

- High Utilization
  - Fairness algorithm should support highest link utilization
  - Unused capacity can be reclaimed and distributed fairly to “bursty” traffic
  - “Bursty” and “guaranteed delay” traffic can co-exist
- Packet Loss in Transit
  - Discarding packets in transit wastes ring BW
  - Fairness algorithm can minimize packet loss on the ring, by admitting only traffic that can reach its destination(s)

# Fairness Algorithm Complexity

- Silicon Implementation
  - Reasonable gate-count
- No master node
  - Fully distributed algorithm
- Stable and Fast Convergence
  - 1-2 ring delay convergence time

# Summary

- Fairness Requirements
  - Support Per-SLA Bandwidth Allocation
    - $\text{BW allocated} = \text{BW reserved} + \text{a proportional or weighted allocation of unused and available BW}$
  - No upstream/downstream or node location dependency