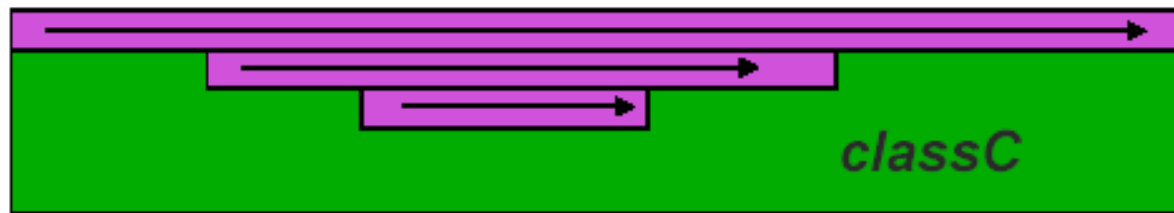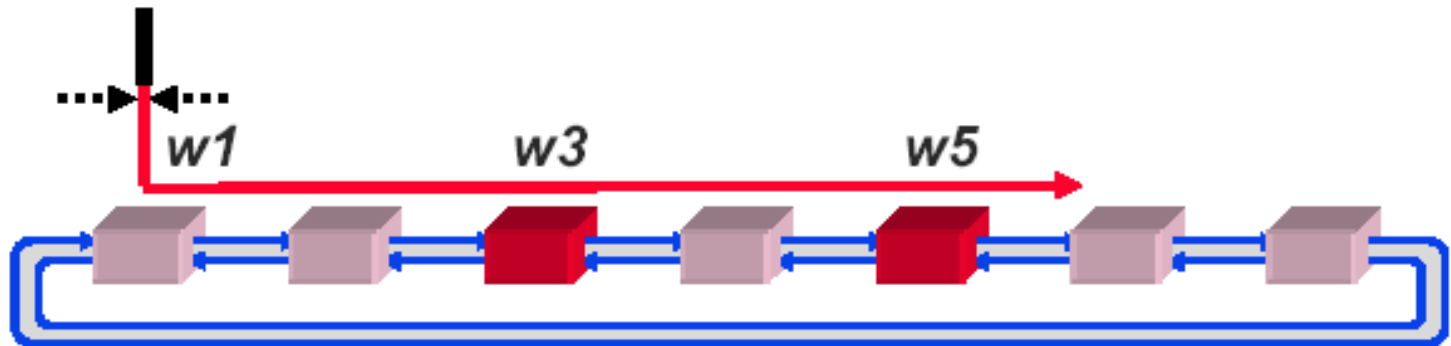# 802.17 RPR
Multichoke fairness

❍ **David V. James, PhD**
Chief Architect
3180 South Ct
Palo Alto, CA 94306
Tel: +1.650.494.0926
Cell: +1.650.954.6906
Fax: +1.360.242.5508
Email: dvj@alum.mit.edu

Multichoke concerns

- ○ **Difficult:**
  - – **Weighted fairness**
  - – **Susceptible to classA & classB usage**
- ○ **Control dynamics**
  - – **Hard-on/hard-off dynamics ➔ oscillation**
  - – **Aggressive and conservative symptoms**
- ○ **Choke point limitations**
  - – **Single choke point resolution**
  - – **Dynamic choke-point allocations & filtering**
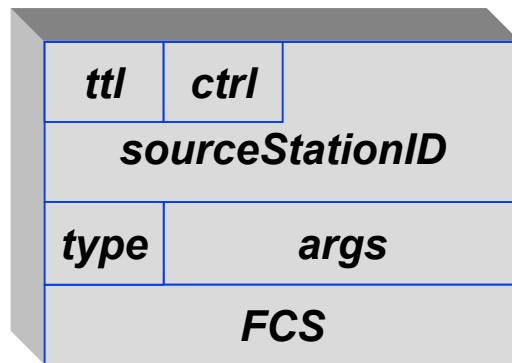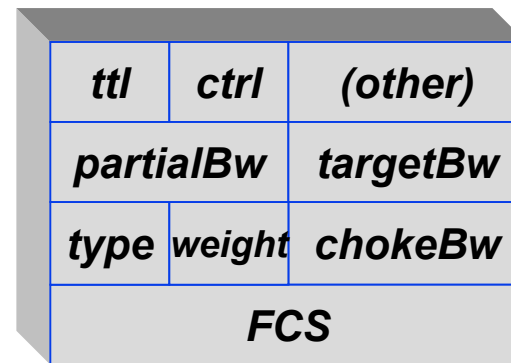
RPR fairness residuals

Control dynamics

❍ **Baseline constraints**

– **Constrained to the fairness frame**

– **Constrained to the fairness-frame rate**

❍ **Additional resolution**

– **16-bit weighting is a concern for A/B**

❍ **Additional parameters**

– **Target upstream bandwidth**

– **Cumulative downstream bandwidth**
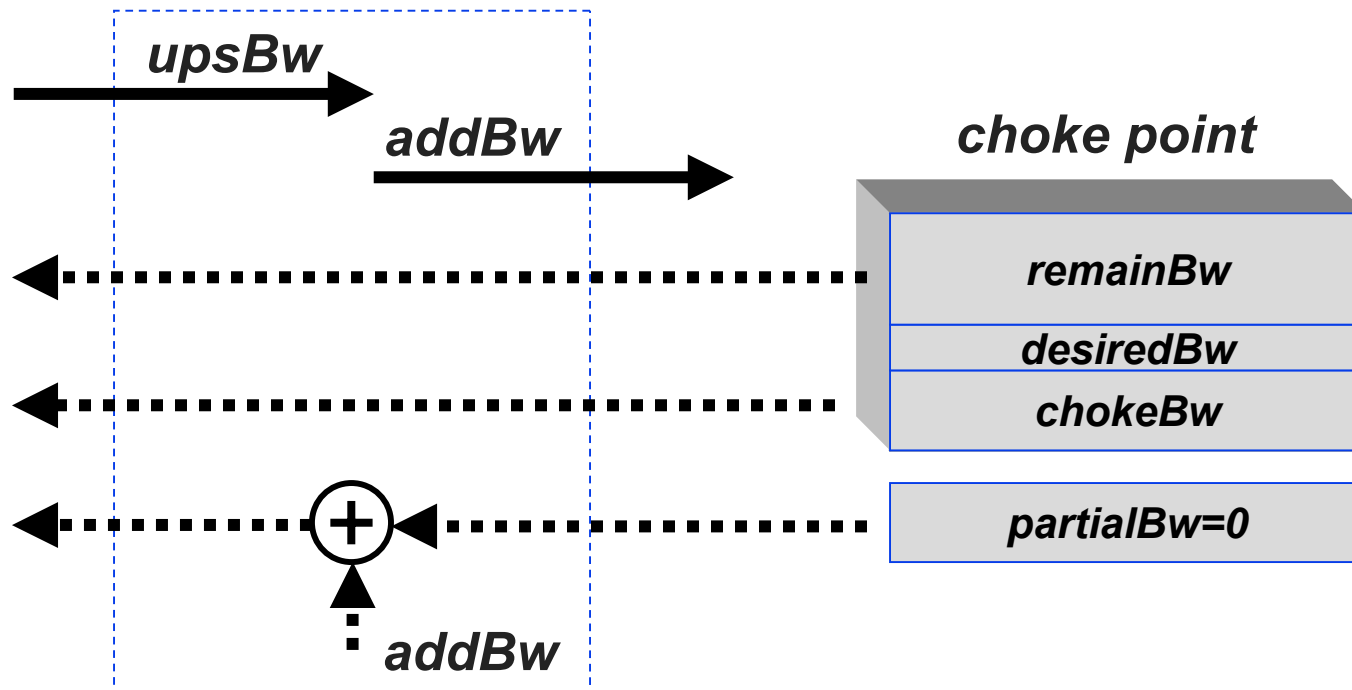
Uniform frame formats

ttl	ctrl	
sourceStationID		
type	args	
FCS		

single-choke

ttl	ctrl	(other)
partialBw	targetBw	
type	weight	chokeBw
FCS		

multi-choke

Upstream parameters

upsBw

addBw

choke point

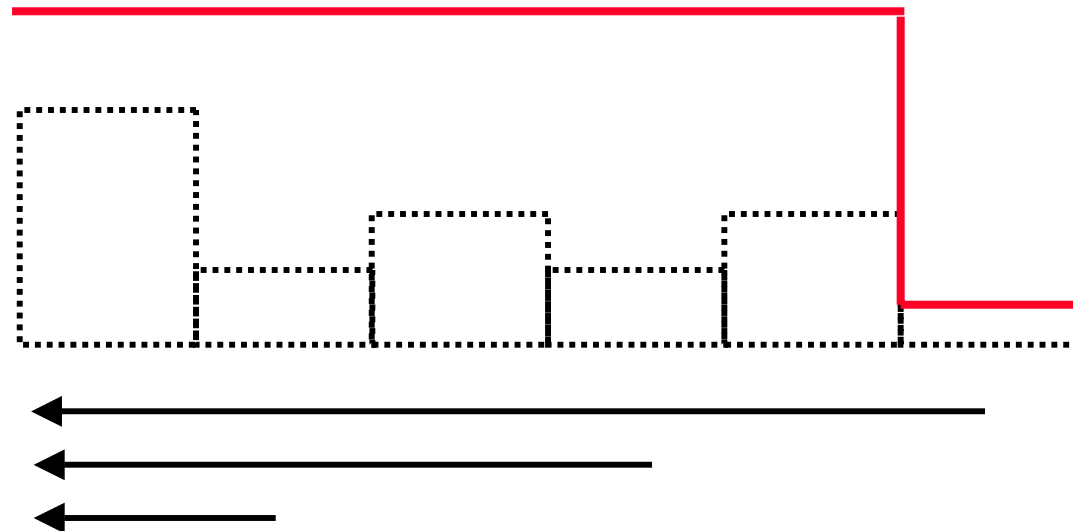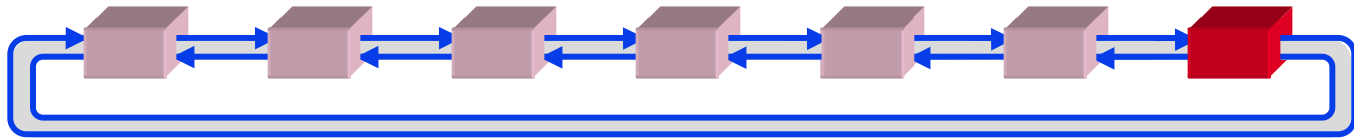*remainBw*

desiredBw

chokeBw

partialBw=0

addBw

totalBw= upsBw+addBw+partialBw
targetBw= remainBw*(addBw/totalBw)
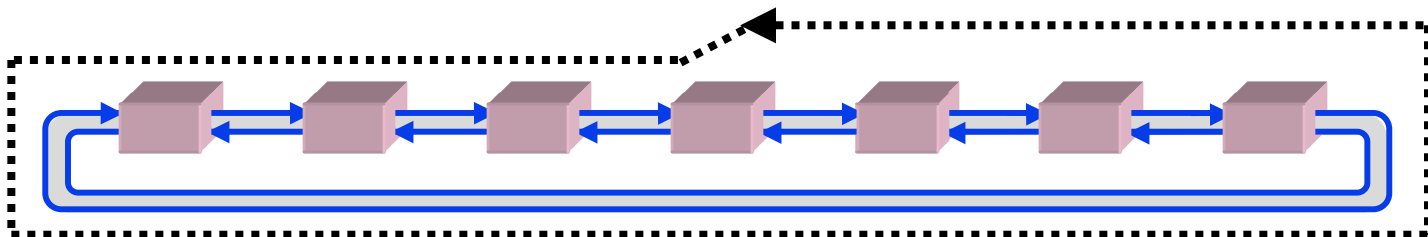
Multichoke resolution

- ❍ **Baseline constraints**
    - – **Constrained to the fairness frame**
    - – **Constrained to the fairness-frame rate**
- ❍ **Additional resolution**
    - – **16-bit weighting is a concern for A/B**
- ❍ **Additional parameters**
    - – **Target upstream bandwidth**
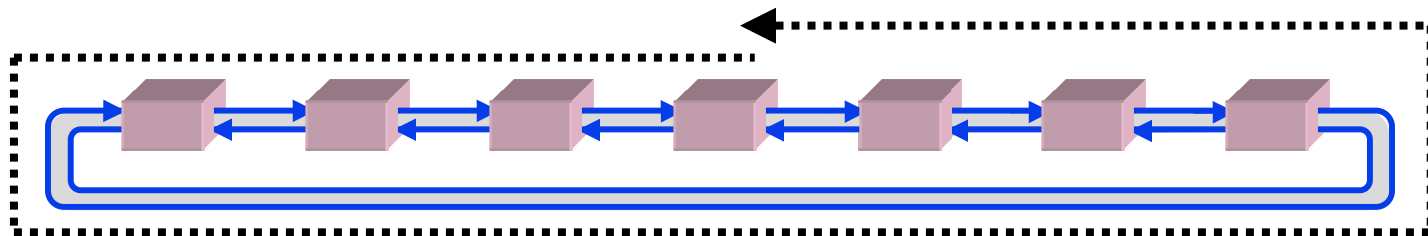   - – **Cumulative downstream bandwidth**

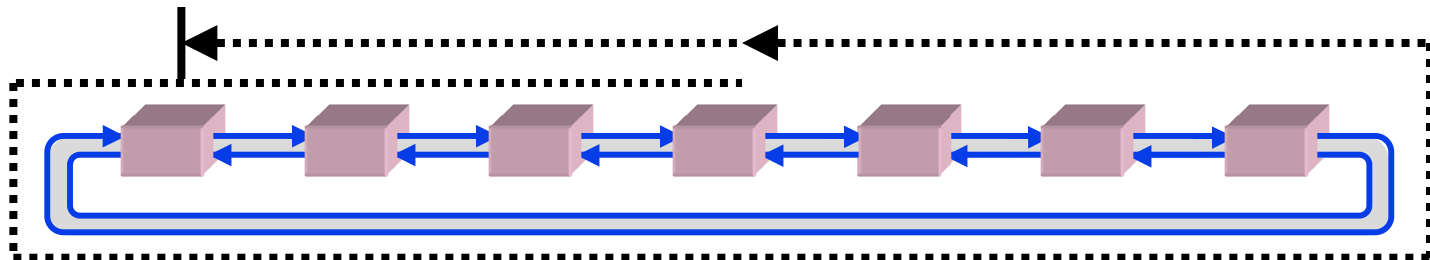# Multichoke profiles
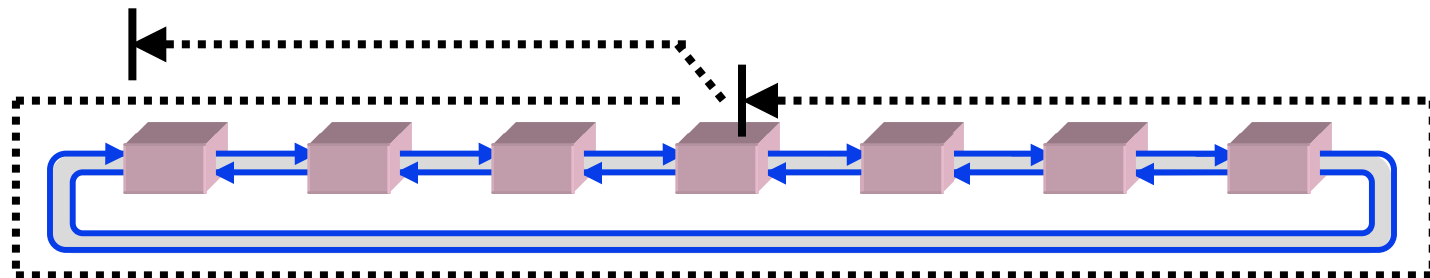
Single-choke sensing

1) Continuous choke

2) Transient choke

Multi-choke sensing

1) Continuous choke

2) Transient choke

Bandwidth "ramping"

- Basic computation
  - goal= rateC*MIN(MAX(2*target,1/16),TARGET)
  - target= target+(goal-target)>>N; // Periodically
  - rateC is blocked-from-sending duty cycle
  - Time constant driven, not period and k