

From the  
Last Class:

- Backpressure Scheduling

- The Backpressure Collection Protocol (BCP)  
(Max Weight)

→ An algorithm, that under idealized assumptions (such as: global sync, central monitoring, solving NP-hard max weight-independent-

set problem, infinite buffers, etc.) guarantees throughput-optimal performance.

BCP is a practical protocol for collecting data from nodes in a wireless sensor network that is inspired by backpressure scheduling, and removes a lot of

the idealized assumptions.

BCP

- does not require time sync
- uses randomized access (from L2 - CSMA layer)
- focuses only on letting nodes make forwarding decisions.
- doesn't assume perfect quality links: hence the ETX term in the weight calculation.

- Simplifies the problem to focus on a single-commodity flow, i.e. all data goes to one sink. (generalizing to handle more flows will require maintaining additional queues, one for each flow).

- does not assume infinite buffers

Recall BCP:

$$w_{ij} = Q_i - Q_j - V \cdot ETX_{ij}$$

Find  $j^*$  that maximizes  $w_{ij}$ .

If  $w_{ij^*} > 0$ , then  
send next pkt from  $i$   
to  $j$ .

If  $w_{ij^*} \leq 0$ , don't send

pkts.

may happen temporarily at other nodes due to local congestion always happens at sink.