Most data collection applications use push, even if latency requirements would allow for pull.

Transform push-based protocol into pull-based one:
– Split operation in sleep and data collection phases.
– Sink triggers phase changes by setting the phase ID in its beacons.

Buffer management and flow control maximize data yield.

Pull-specific protocol optimizations due to decoupling data sampling from data transmission.

Feasibility demonstration with a basic implementation of the Collection Tree Protocol (CTP) [1] running on top of X-MAC [2]:
– 35-node sensor testbed equipped with Tmote Sky devices running the Contiki OS.
– Compare power consumptions of push and pull, due to reliability modifications 100% data yield achieved.

Pull consumes 90% less power in the sleep than in the data collection phase.

30% to 40% energy gain with pull, provided application has relaxed latency requirements.