

Pure ACKs in ECN++

Part A: The process about Pure ACKs in ECN++ draft

ECN++ [set ECT on pure ACKs](#).

A host that sets ECT on pure ACKs **MUST reduce its congestion window in response to any congestion feedback**, in order to regulate any data segments it might be sending amongst the pure ACKs.

- Cwnd Response to CE-Marked Pure ACKs
- ACK Rate Response to CE-Marked Pure ACKs
 - AckCC [\[RFC5690\]](#) to regulate the pure ACK rate, but this is **not required**

The question of whether the receiver of pure ACKs is required to feed back any CE marks on them is a matter for the relevant feedback specification ([\[RFC3168\]](#) or [\[I-D.ietf-tcpm-accurate-ecn\]](#)).

- AccECN: count CE marking of any control packet including pure ACKs
- classic ECN: is silent on this point, so feedback of CE-markings might be implementation specific, see [Section 4.4.1](#)

Detection: The receiver of a pure ACK can detect a CE marking on it:

* Classic feedback: the receiver will not expect CE marks on pure ACKs, so it will be implementation-dependent whether it happens to check for CE marks on all packets.

Detection in ECN++: [check for CE marks on all packets](#)

Feedback: TCP never ACKs a pure ACK, but the receiver of a CE-mark on a pure ACK can feed it back when it sends a subsequent data segment (if it ever does):

* Classic feedback: the receiver (of the pure ACKs) would set the echo congestion experienced (ECE) flag in the TCP header as normal.

Congestion response: In either case (classic or AccECN feedback), if the TCP sender does receive feedback about CE-markings on pure ACKs, it will react in the usual way by reducing its congestion window accordingly. This will regulate the rate of any data packets it is sending amongst the pure ACKs.

Part B: Issues

① Pure ACK means data packet with ack or empty packet with ack or both of them?

It is not so clear in the draft. If set ECT in pure ACK with no data, in the responder side things will be disorder such as Figure 2.

So, my opinion is [not set ECT in pure ACK with no data](#). Because in draft, setting ECT in pure ACKs is in order to regulate any data segments it might be sending amongst the pure ACKs.

② Implement AckCC [\[RFC5690\]](#) to regulate the pure ACK rate or Not?

This part is an opinion and not required. So not implement in this GSoC.

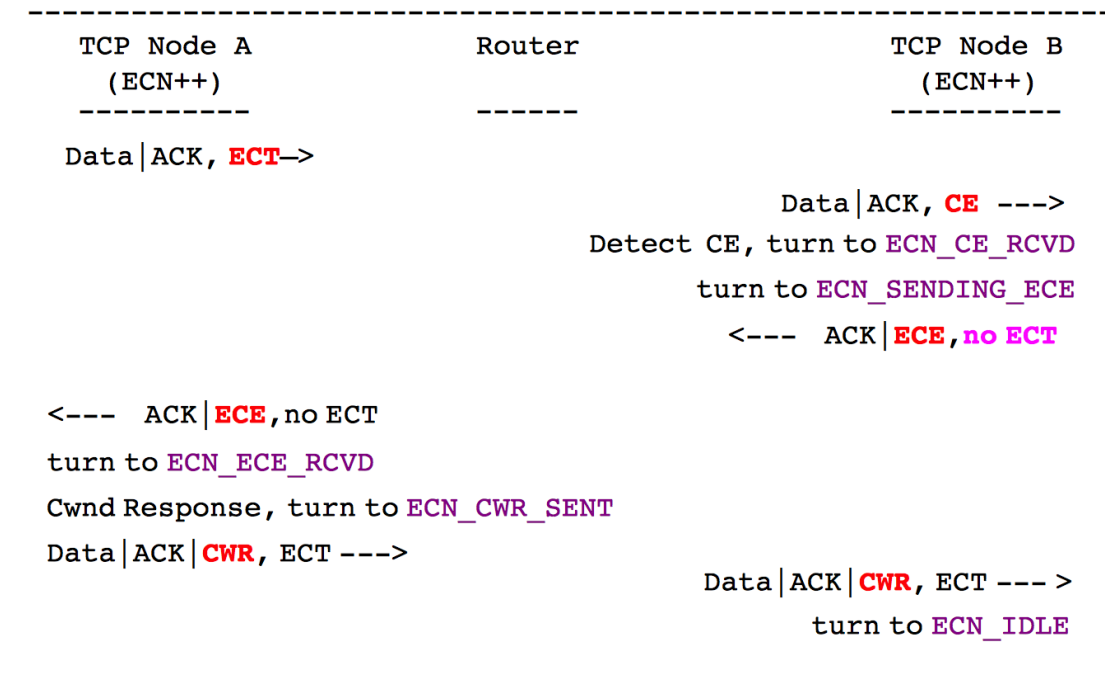


Figure 1: Not Set ECT in pure ACK with no data

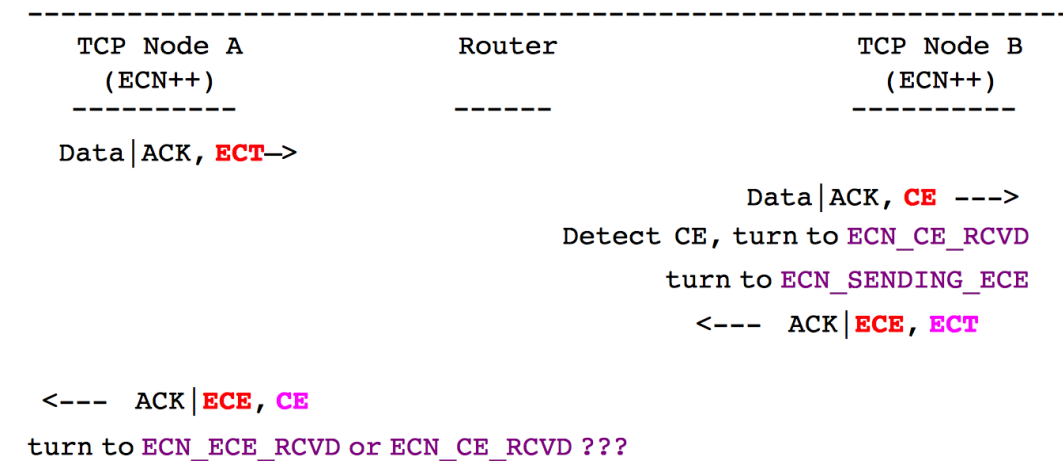


Figure 2: Set ECT in pure ACK with no data

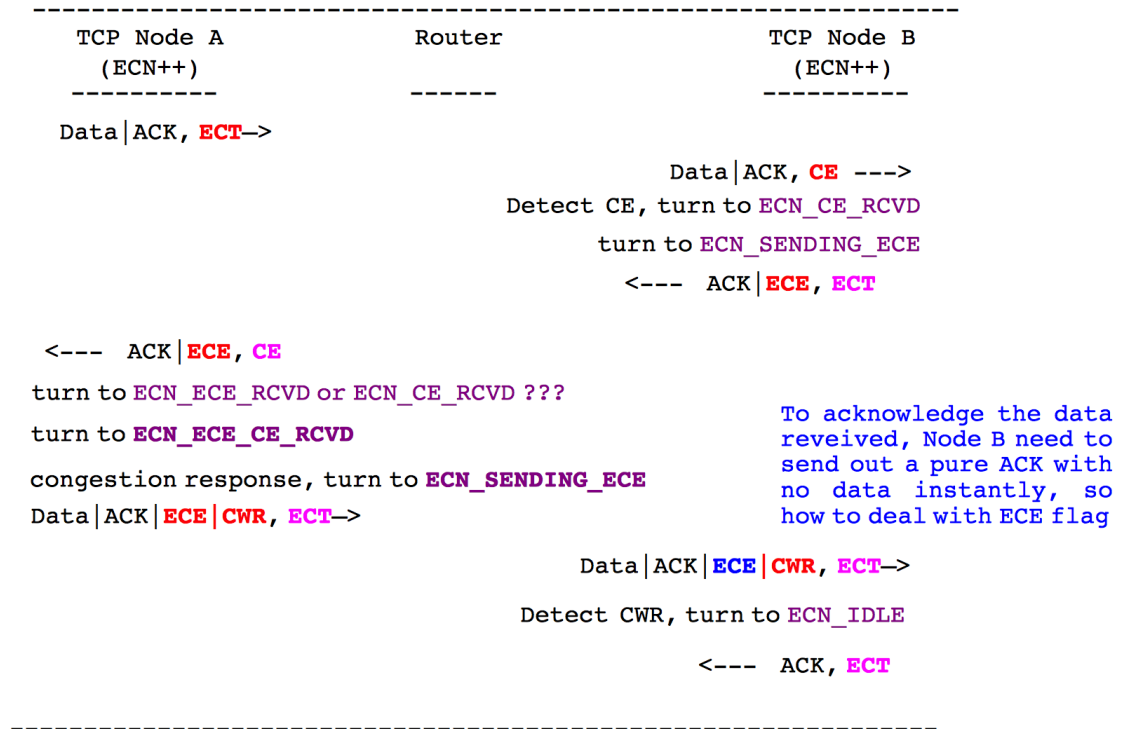


Figure 2: Set ECT in pure ACK with no data