Link delay protocol: (t2, t3) vs (t3-t2)

Chuck Harrison

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1588 Link delay measurement feature: “Pdelay_Req”

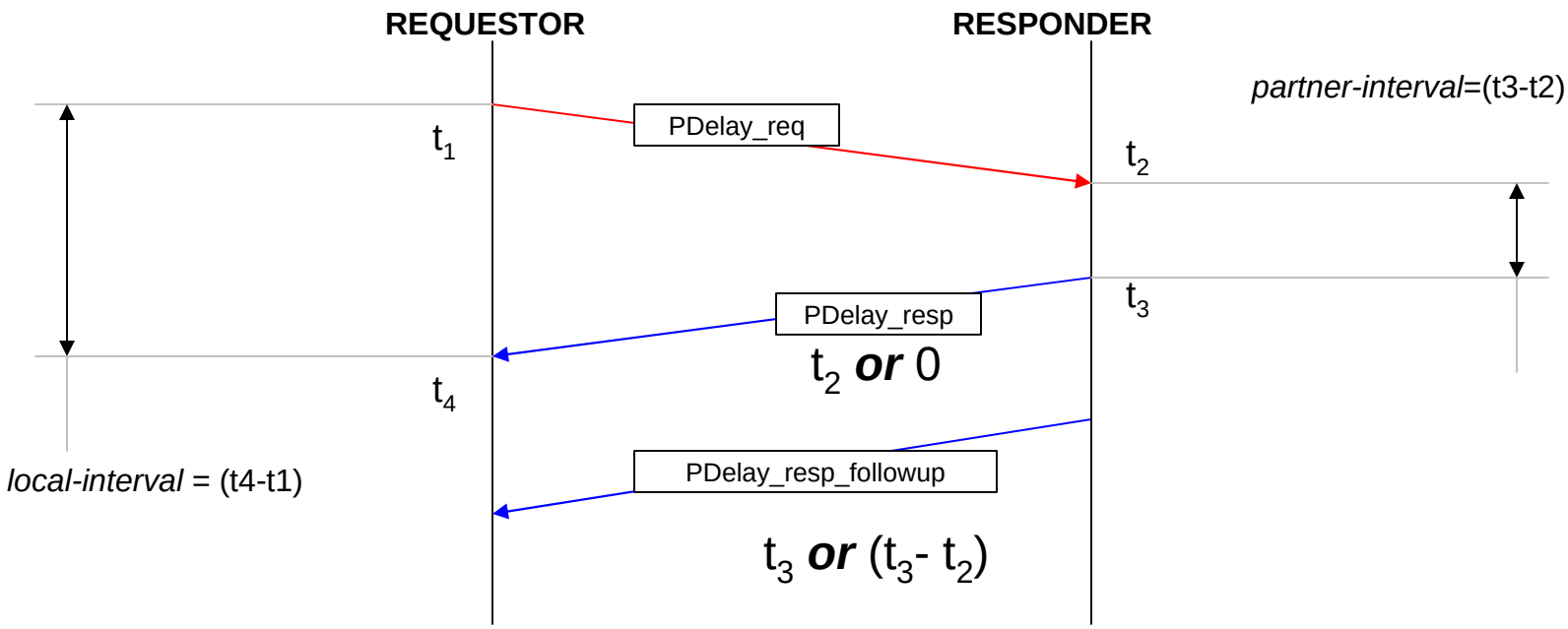
- Consists of a timestamped message exchange between requestor and responder
- Requestor knows his own egress and ingress timestamps (t1, t4 respectively)

  t4-t1 = gross roundtrip time
- Responder knows his own ingress and egress timestamps (t2, t3 respectively)

  t3-t2 = responder turnaround time
- Requestor learns t2,t3 or (t3-t2) from responder, computes link roundtrip:

  t4-t1 – (t3-t2) = net link roundtrip = 2 * link delay
- 1588 provides option of sending t2, t3 or (t3-t2)

PDelay_Response options



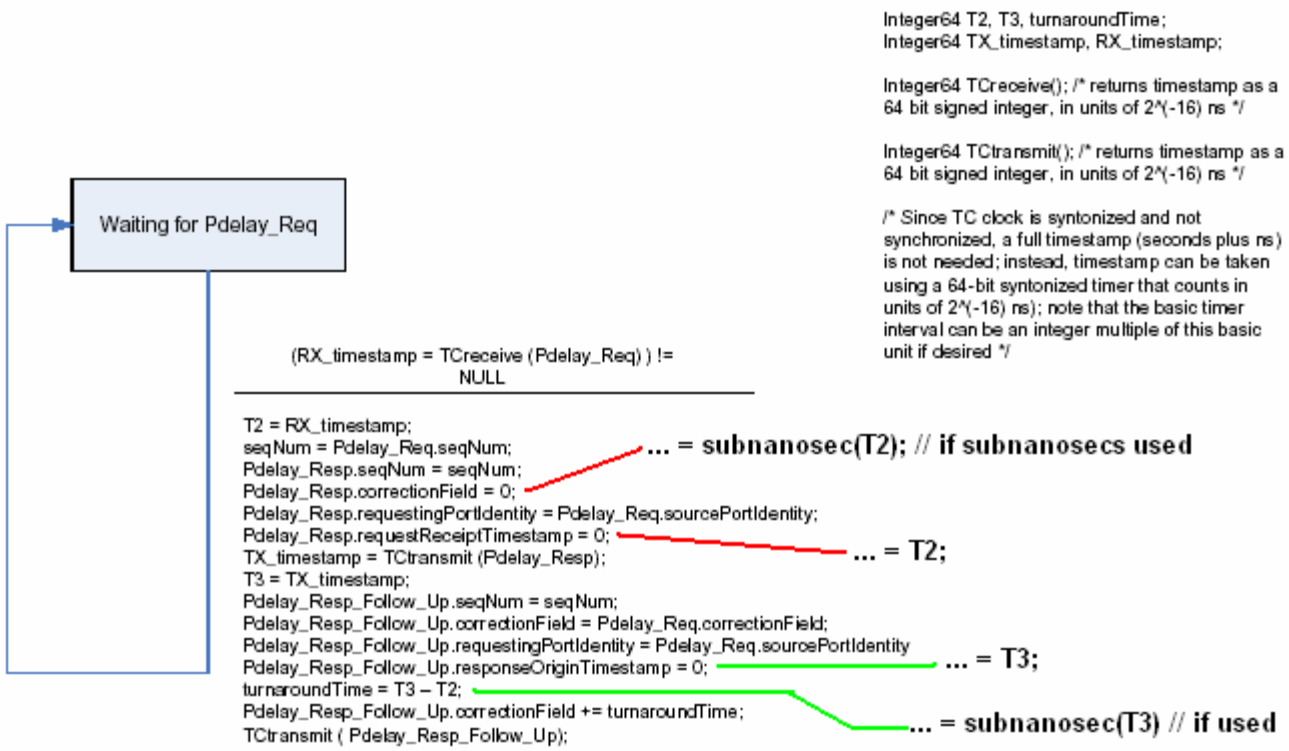


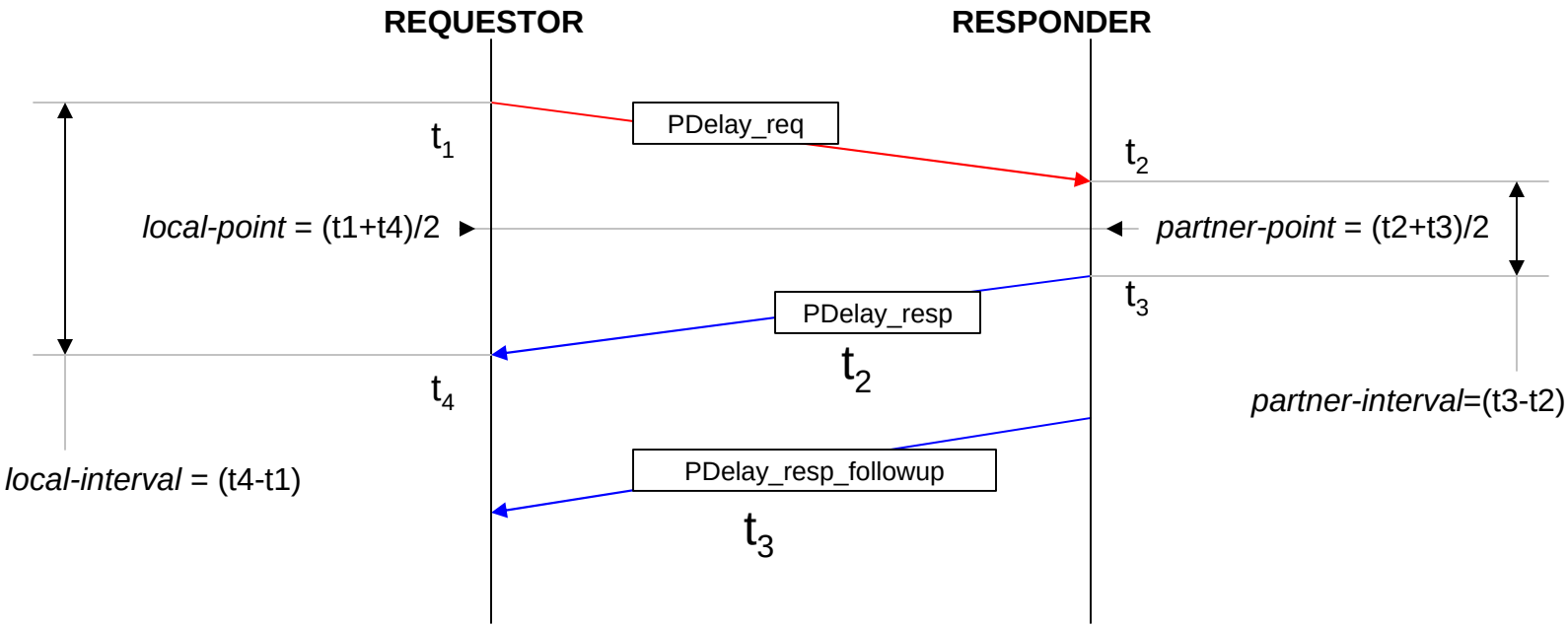
Figure 2-1. State machine, and corresponding C code, for Pdelay responder P2P TC port

Ref: as-garner-protocol-state-machines-frame-formats-0307.pdf

Why?

- Transfer more information at no increase in bandwidth or implementation complexity
- Extra information allows correlation of device epochs and tracking of freq offset
  - Turnaround time can be compensated for freq offset
  - Additional non-1588 services (e.g. Network Event, Proximity Control) can be implemented

Epoch correlation
(supports frequency offset compensation)



Summary

- 1588 allows two alternative modes of operation for PDelay_Response
- We should choose just one for AVB profile compliance
- Choosing (t_2, t_3) rather than (t_3-t_2) costs almost nothing and provides more functionality
- Let’s choose (t_2, t_3) as standard.