Switch

PTP over transponder links

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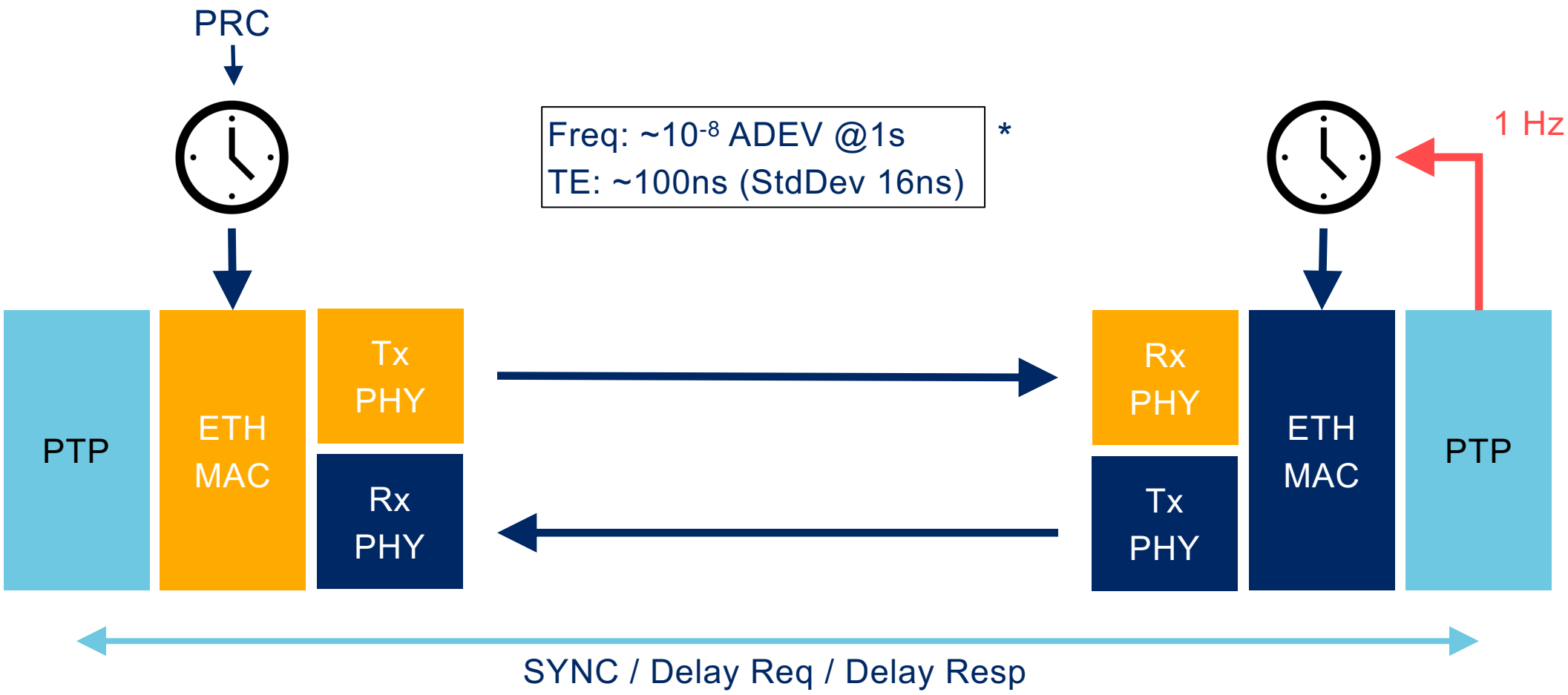
Context

– Run PTP over long distance (>80km)
– Aim for PRTC accuracy <100ns (ITU G8272)

– Data traffic at 100Gbit/s (or future 400+ Gbit/s)
– Using DWDM transponders/muxponders

– Long answer: it’s about SyncE, not PTP

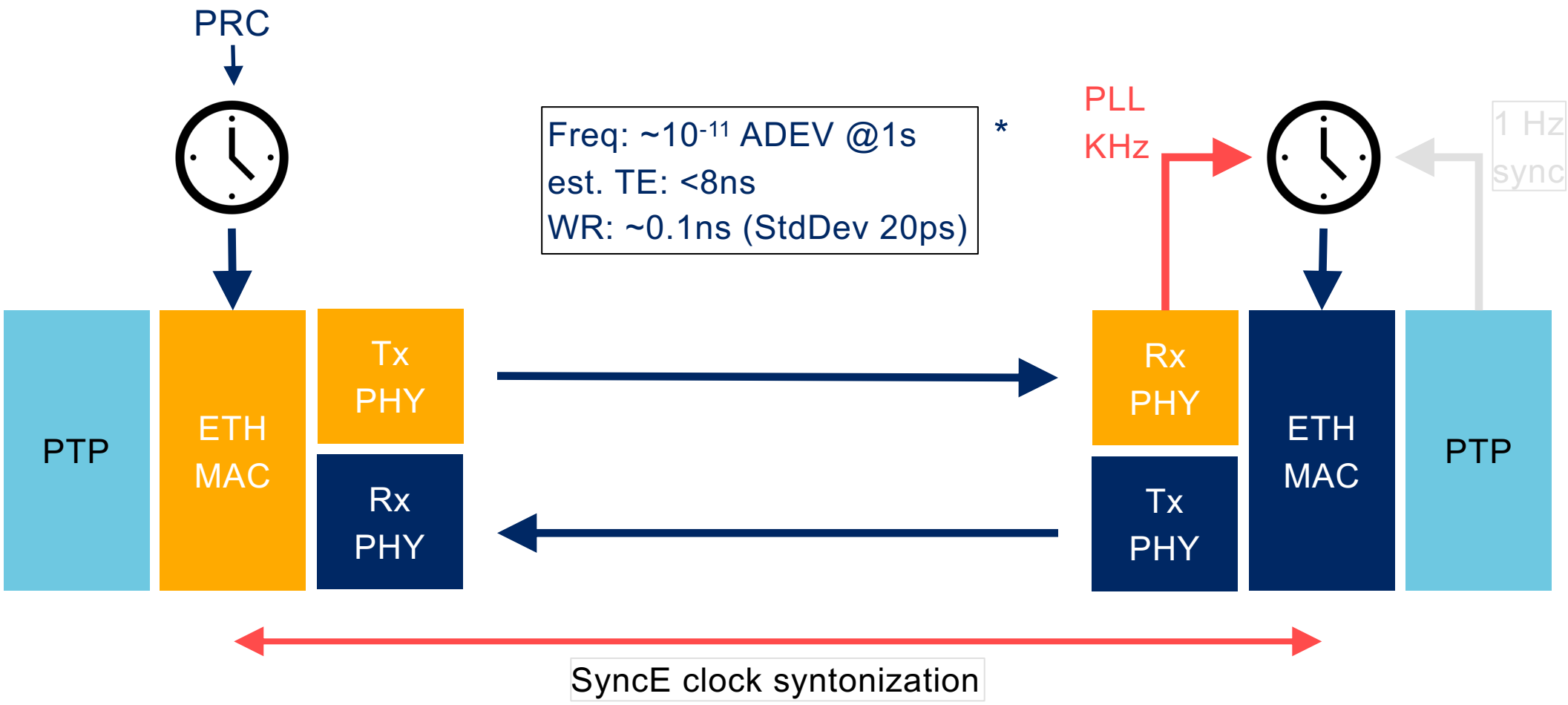
SyncE or not



syntonized clock domains

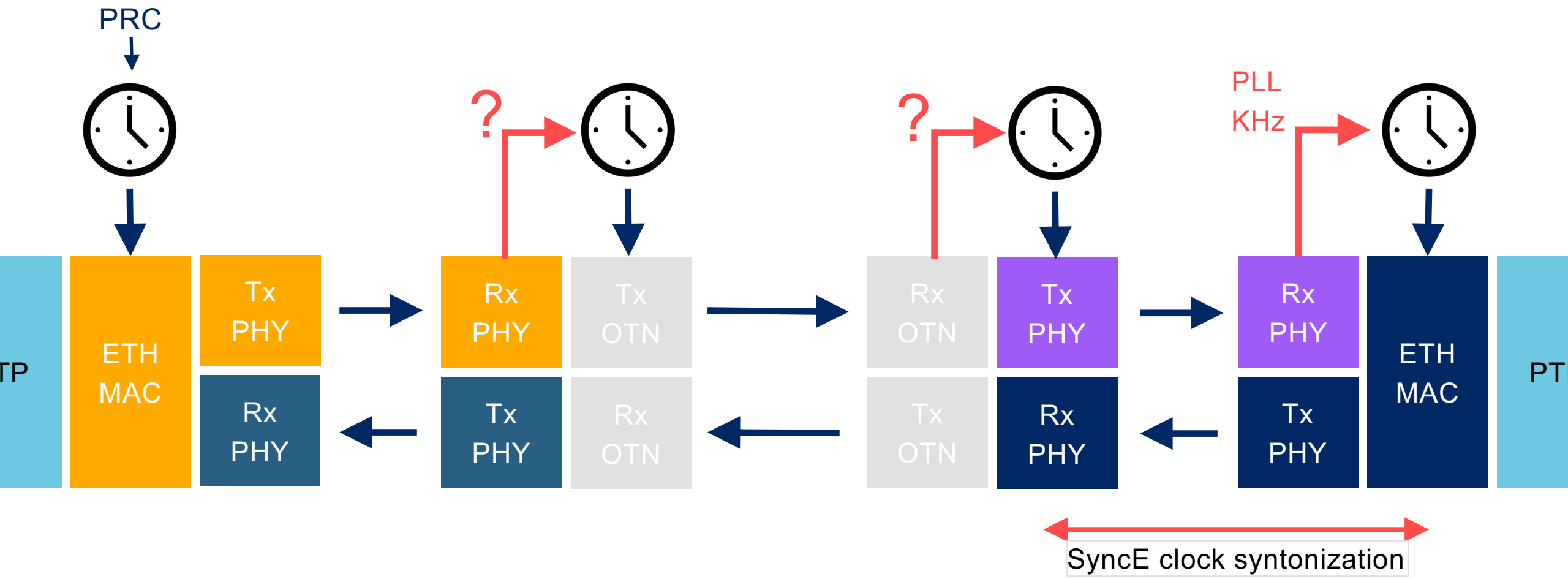
* measured on WhiteRabbit switch
forced to plain PTP,
lab environment, 1m short link

SyncE or not



* measured on WhiteRabbit switch
estimated for plain PTP + SyncE,
lab environment, 1m short link

SyncE with transponders



syntonized clock domains

Solutions?

- If accuracy of PTP **without** SyncE is ok, don't worry.

- Transponders with sychronous mapping
  - Muxpondres most likely not
    - 2x100G to OTUC2 (200G coheren line)
  - Pure transponders may provide it
    - 10G to OTU2
    - 40G to OTU3
    - 100G to OTU4
    - 400G to OTUC4
  - **Check with your vendor!**

- DWDM system with clock synchronization from PRC
  - Alien DWDM transmission (colored optics in the router)
    - 1G 160km (1000km+ amplified)
    - 10G up to 80km (1000km+ amplified and dispersion compensated)
    - *400G Coherent ZR+?*
  - Specialized time apliances (still alien DWDM PTP+SyncE)
    - Meinberg Lantime
    - Oscilloquartz OSA
  - White Rabbit
    - Single fiber bidir in CWDM sidechannel

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