IEEE 802.3cd 100GAUI-2 to 100GBASE-DR Jitter Challenge

IEEE P802.3cd Task Force

Ad Hoc Meeting, October 2017

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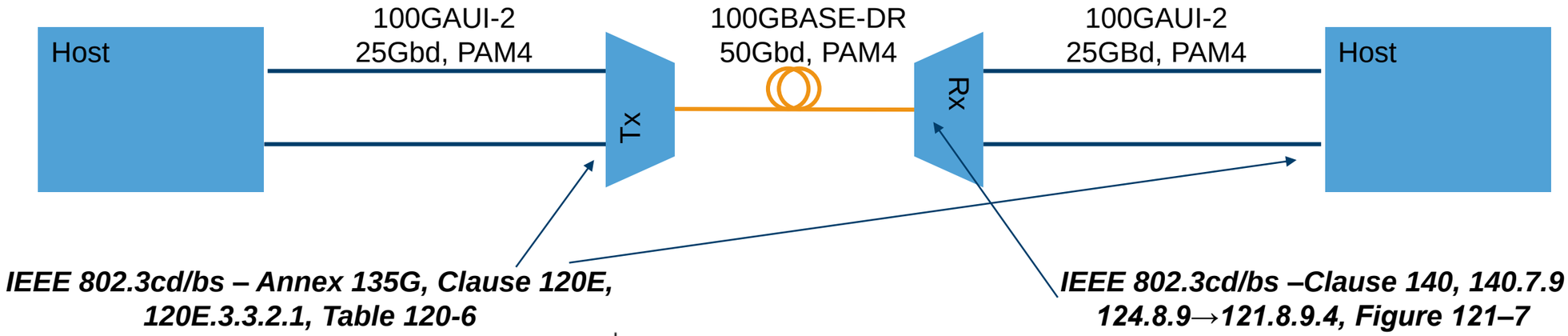
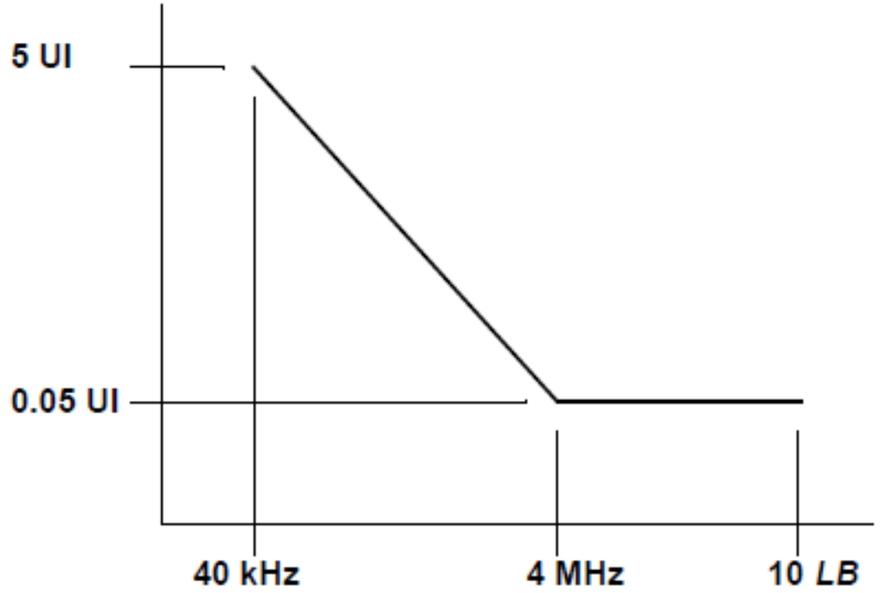
IEEE 802.3cd 100GAUI-2 to 100GBASE-DR Jitter Challenge

The specification as it is now



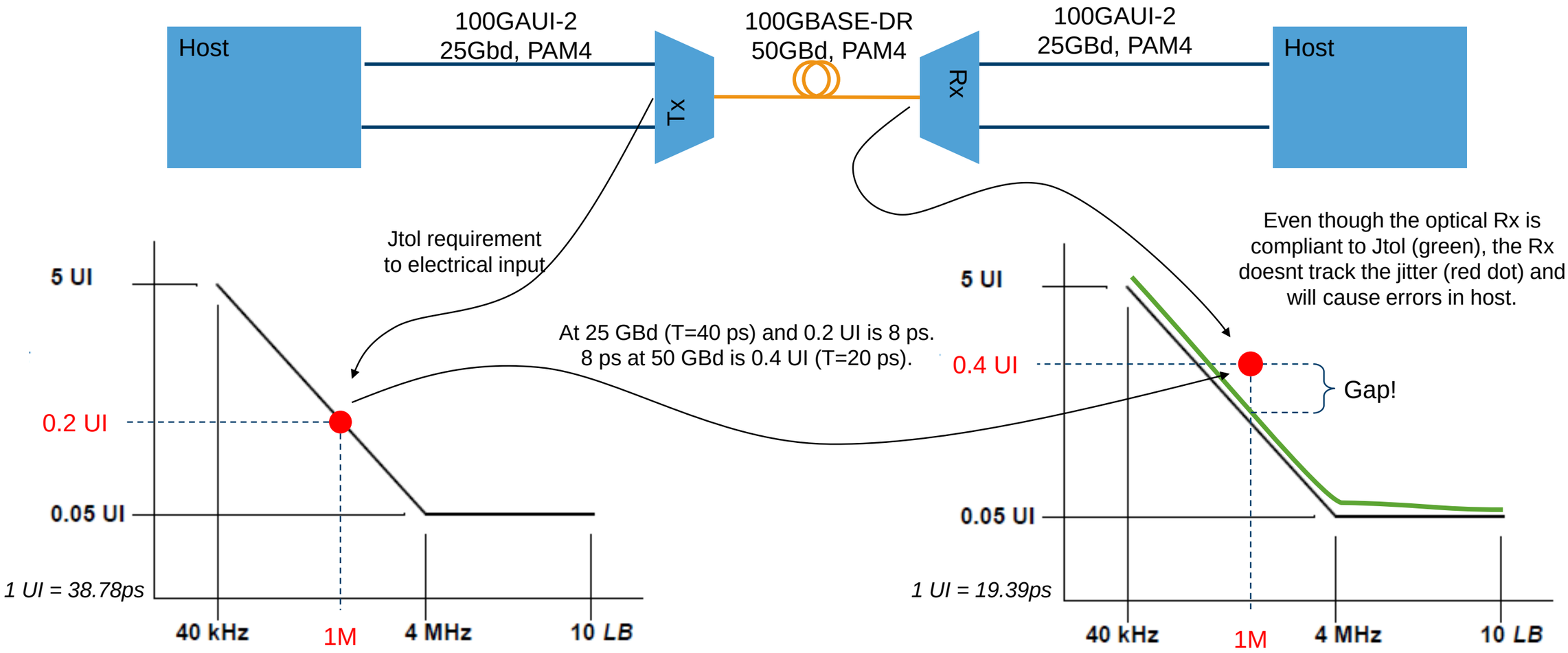
IEEE 802.3cd/bs – Annex 135G, Clause 120E, 120E.3.3.2.1, Table 120-6

IEEE 802.3cd/bs –Clause 140, 140.7.9 124.8.9→121.8.9.4, Figure 121–7



IEEE 802.3cd 100GAUI-2 to 100GBASE-DR Jitter Challenge

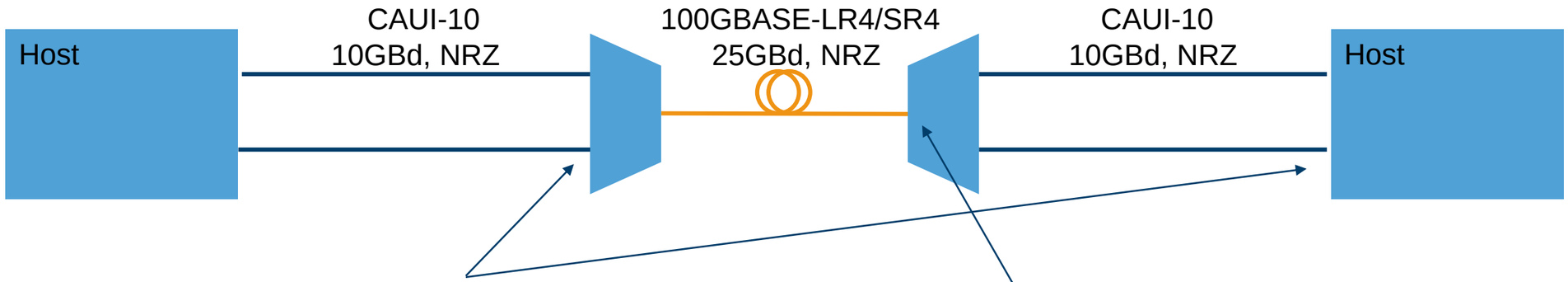
Concern:
The jitter tolerance mask is the same (in UI) for the AUI-8 electrical 25 GBd interface as for the optical 50 GBd receiver. But UI is different.
In the worst case Tx will track the jitter with Jtol mask and the jitter at the optical 50 GBd will be doubled in terms of UI.
An optical receiver Rx marginally compliant will not be able to track this and hence cause bit errors.



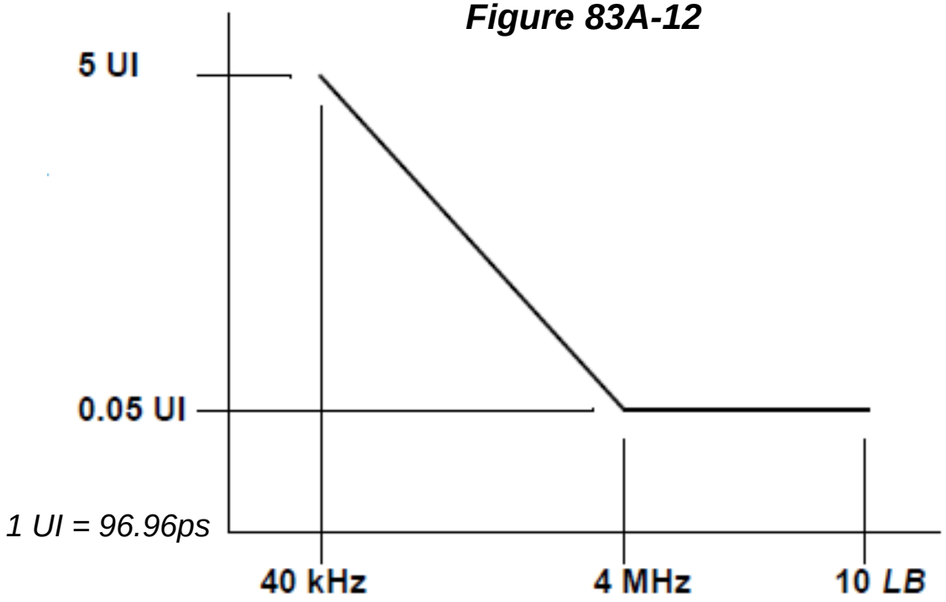
IEEE 802.3 CAUI-10 to 10GBASE-LR4 jitter conversion

How did previous projects address the jitter conversion

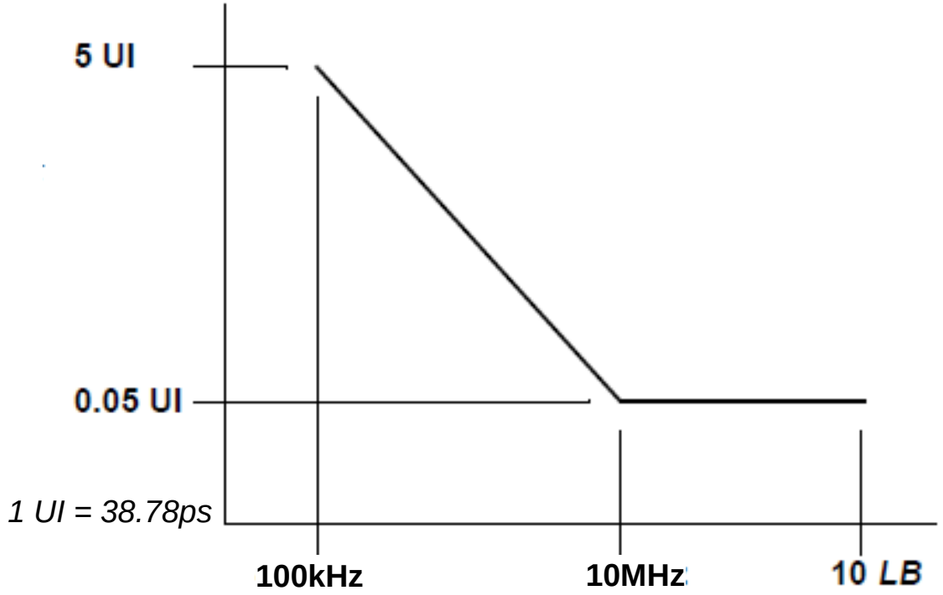
IEEE 802.3 CAUI-10 to 10GBASE-LR4 jitter conversion



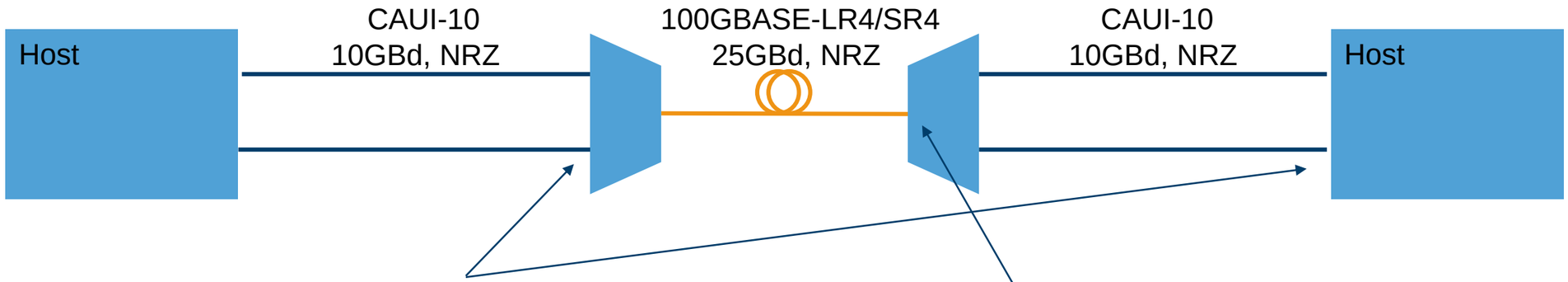
IEEE 802.3 – Clause 83B.2.3→83A.3.4.6
Figure 83A-12



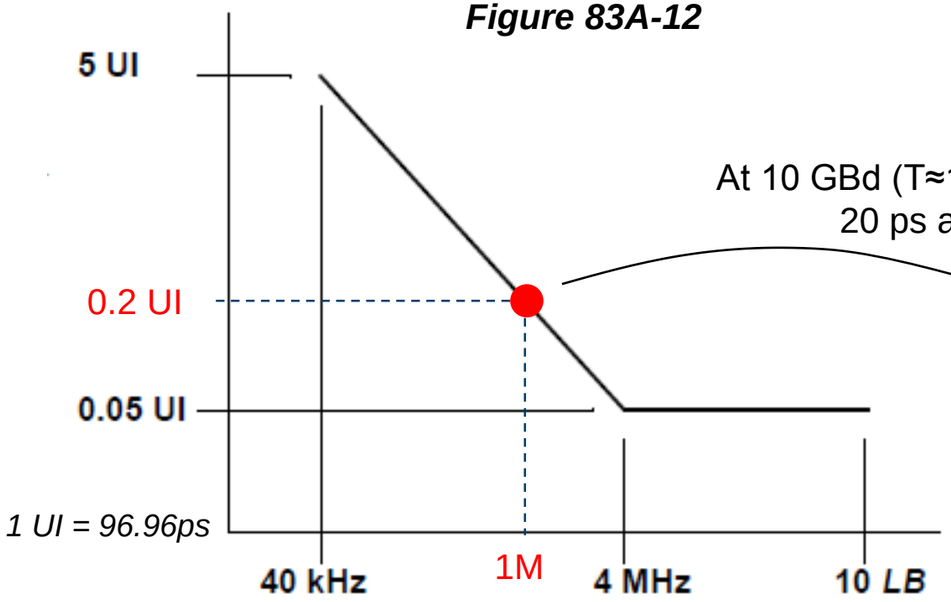
IEEE 802.3 – 88.8.10



IEEE 802.3 CAUI-10 to 10GBASE-LR4 jitter conversion

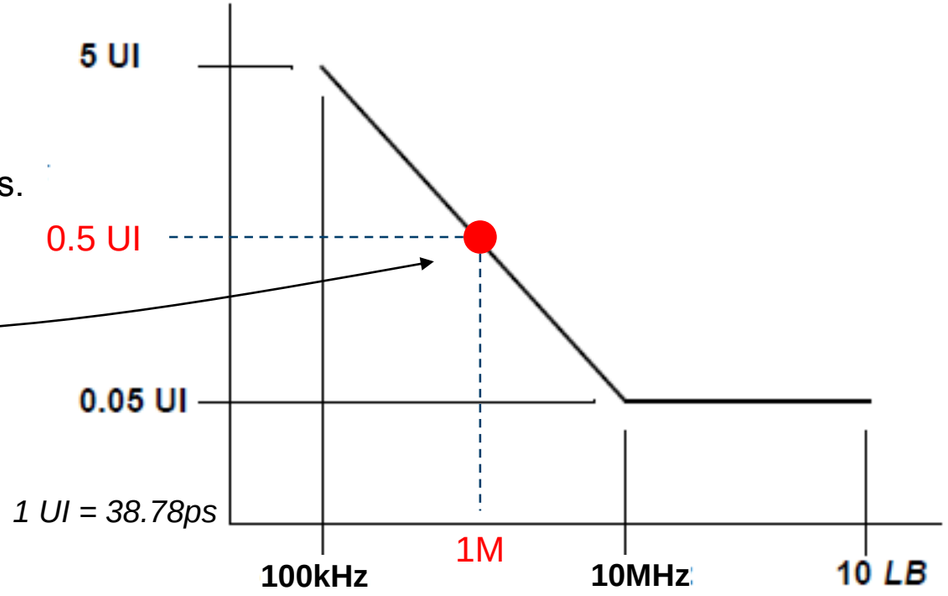


IEEE 802.3 – Clause 83B.2.3→83A.3.4.6
Figure 83A-12



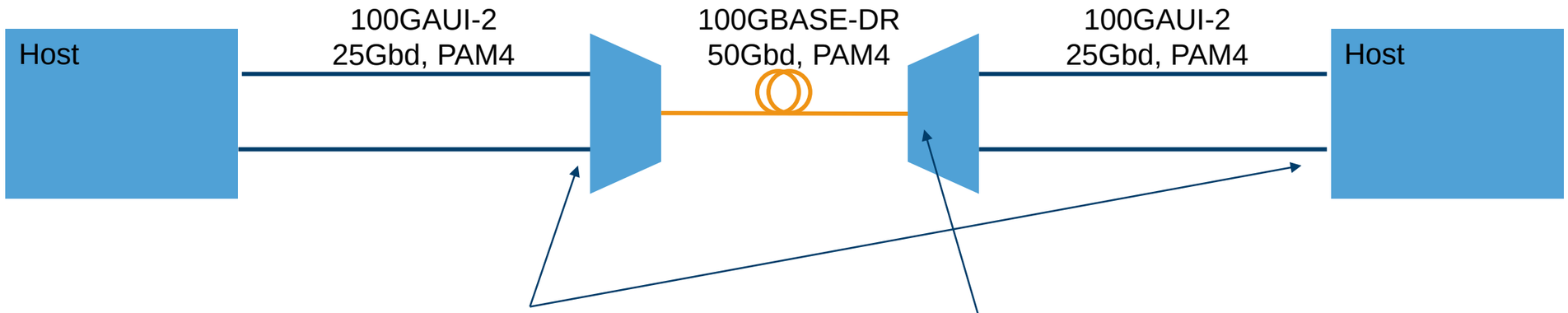
At 10 GBd (T≈100 ps) and 0.2 UI is 20 ps.
20 ps at 100 GBd is 0.5 UI

IEEE 802.3 – 88.8.10

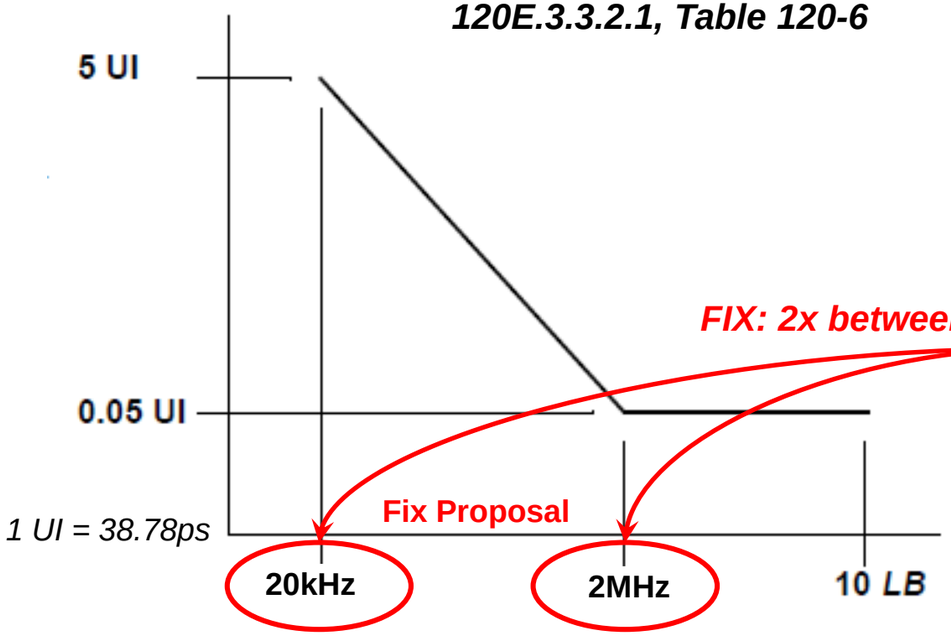


Fix Alternatives

IEEE 802.3cd 100GAUI-2 PLL Solution Example



IEEE 802.3cd/bs – Annex 135G, Clause 120E, 120E.3.3.2.1, Table 120-6



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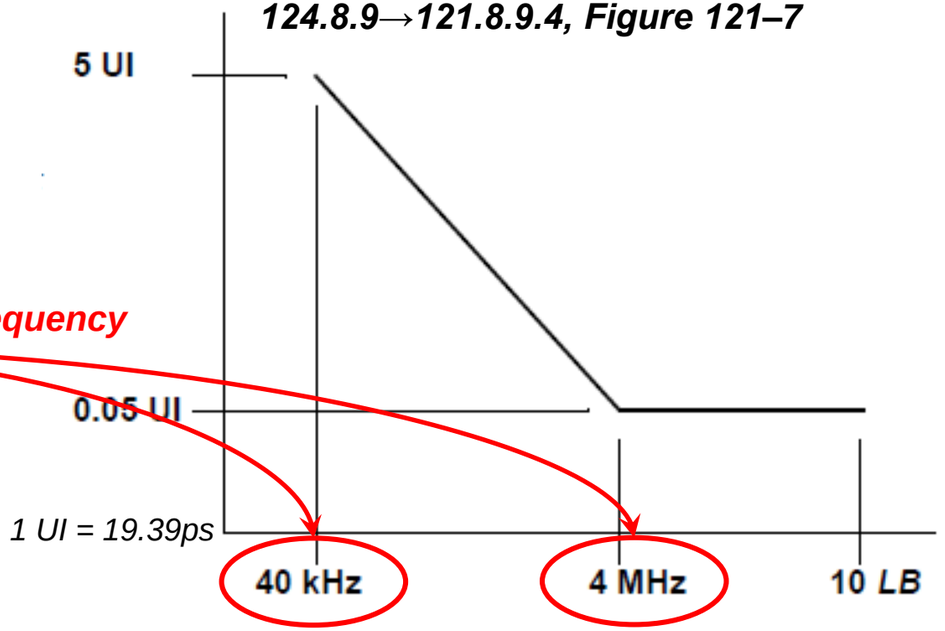
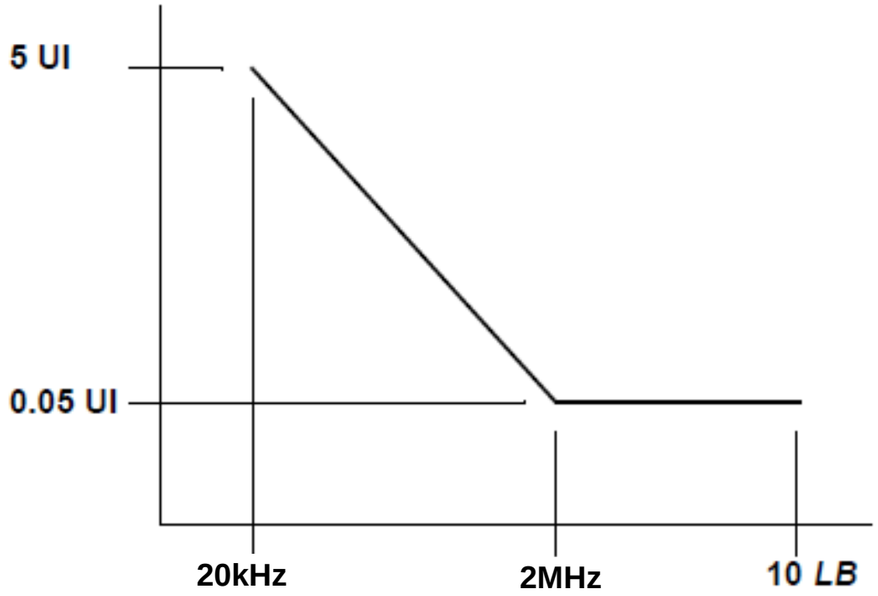


FIX: 2x between loop filter cut off frequency

Fix Proposal

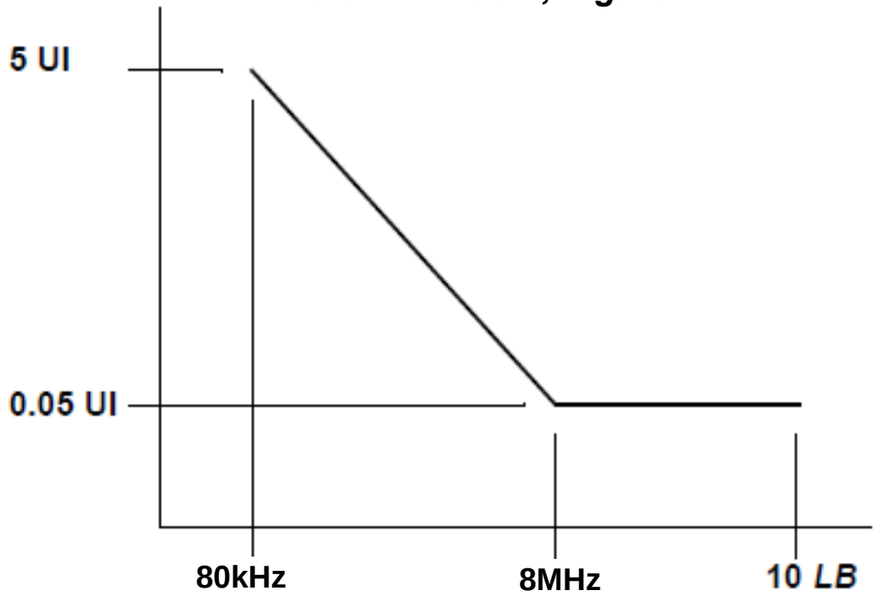
Fix Options, 2 of Many

IEEE 802.3cd/bs – Annex 135G, Clause 120E, 120E.3.3.2.1, Table 120-6



- Change the 100GCAUI-2 down in frequency

IEEE 802.3cd/bs –Clause 140, 140.7.9 124.8.9→121.8.9.4, Figure 121–7



- Change the 100GBASE-DR4 up in frequency

Thank You