
802.1AS error-sources for 802.11v

Discussion materials

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2008-11-24

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Background

In 2007 the 802.1 AVB TG created time error budgets for various scenarios for Ethernet configurations in:

<http://www.ieee802.org/1/files/public/docs2007/as-garner-assumptions-for-error-sources-time-synch-0507-v03.pdf>

The following slide is NOT a proposal, but is rather intended to guide a discussion of the appropriate distribution of the error budget for 802.11 links.

The goal is to maintain +/- 500ns time accuracy across 7 network hops.

802.11v time error budget

- **PHY latency asymmetry**

- Will have constant and variable components
- Constant bias:
 - Max uncompensated asymmetry between the timestamp point and the antenna in the Tx and Rx paths
 - 30ns
- Variable error:
 - Multipath delay error $\leq (\text{max reflections time}) - (\text{Line-of-sight flight time})$
 - $(70\text{ns} - 0\text{ns}) = 70\text{ns}$

- **Phase measurement granularity**

- Timestamp granularity $\leq 40\text{ns}$, assuming $>25\text{MHz}$ crystal

Time budget is $1\mu\text{s}/7$ hops = 142ns per hop

→ Adding values above: $60 - 80 = 140\text{ns}$