802.1AS error-sources for 802.11v Discussion materials

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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 <= (max reflections time) - (Line-of-sight flight time)
      - (70ns-0ns) = 70ns
- **Phase measurement granularity**
  - Timestamp granularity <=40ns, assuming >25MHz crystal

Time budget is 1us/7 hops = 142ns per hop

→ Adding values above: 30 + 70 + 40 = 140ns