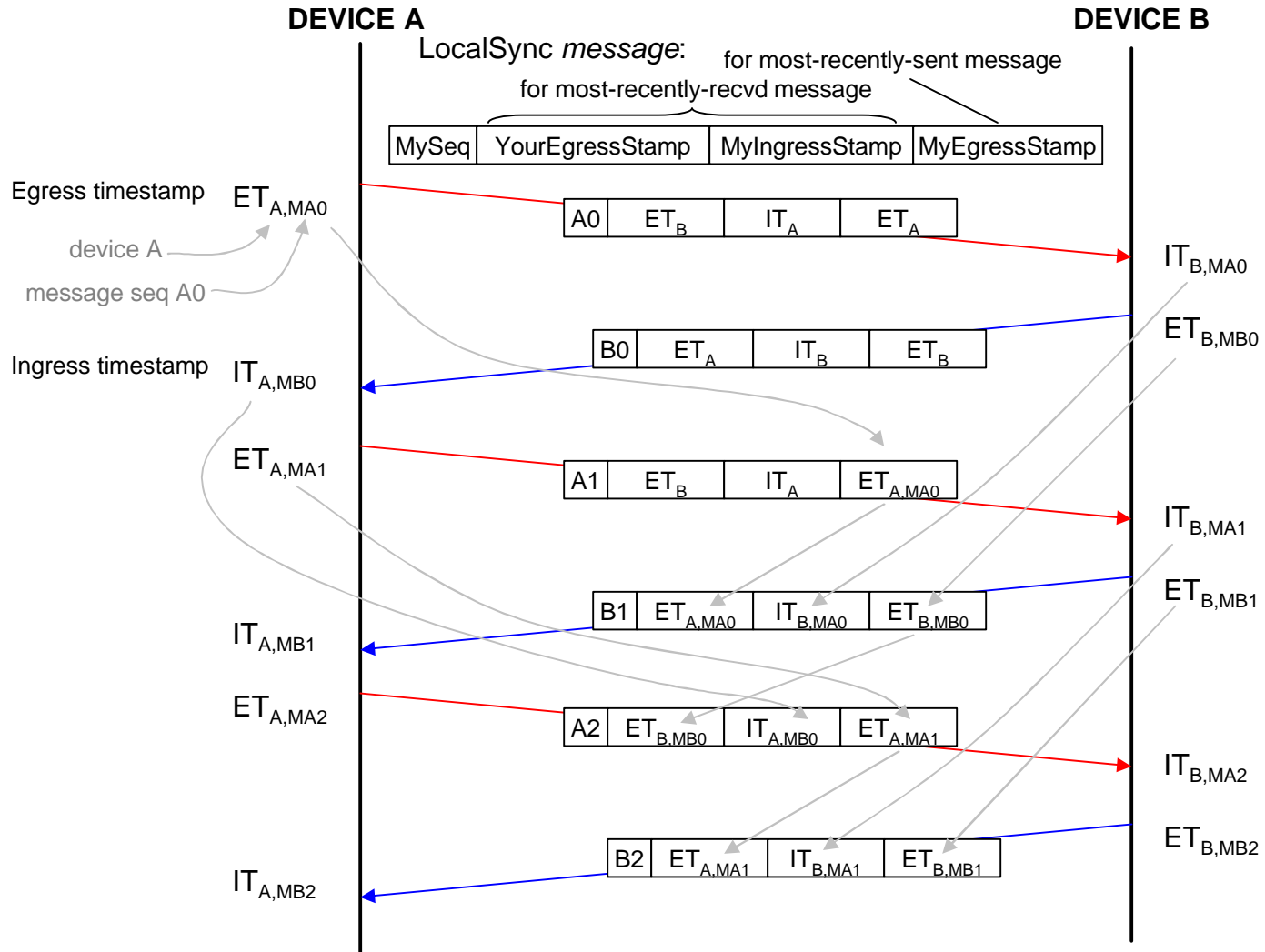


Partner clock calibration protocol for Event-based synchronization

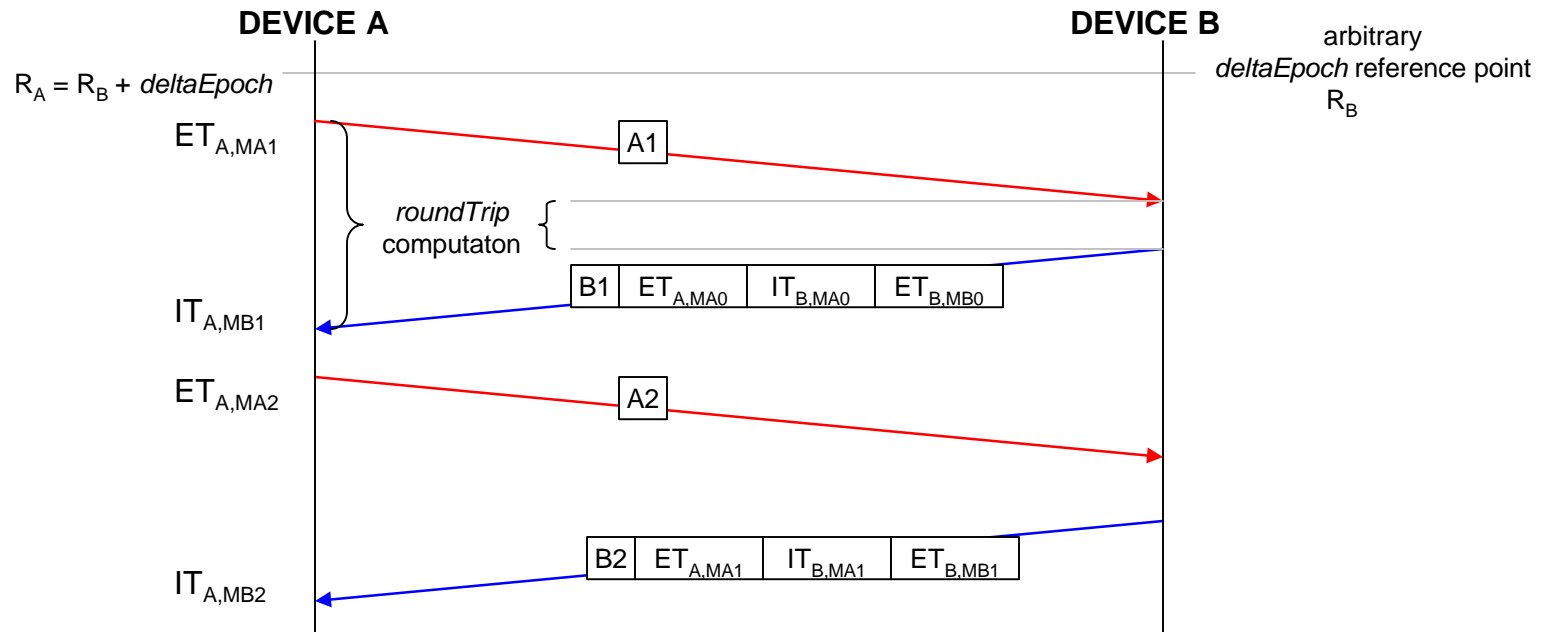
802.1AS Timing and Synchronization for Time-
Sensitive Applications in Bridged
Local Area Networks

Chuck Harrison
15 February 2007

Link partner exchange of LocalSync frames



Partner clock calibration using LocalSync data (view at device A)



Rate computation

$$yourRate = \frac{ET_{A,MA0} - ET_{A,MA1}}{IT_{B,MA0} - IT_{B,MA1}}$$

Epoch difference computation

$$\delta Epoch = IT_{A,MB1} - roundTrip / 2 - ET_{B,MB1} * yourRate + R_B (yourRate - 1)$$

Roundtrip delay computation

$$roundTrip = (ET_{B,MB1} - IT_{B,MA1}) yourRate + IT_{A,MB1} - ET_{A,MA1}$$

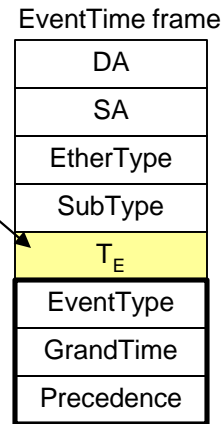
Timescale conversion formula

$$T_A = (T_B - R_B) yourRate + R_B + \delta Epoch$$

Forwarding of EventTime protocol frames by 802.1AS bridge

$$T_E = (T_E - R_B) \text{ yourRate} + R_B + \text{deltaEpoch}$$

Conversion parameters *yourRate* and *deltaEpoch* are maintained by lower level media-dependent 802.1AS partner clock calibration protocol exchanging LocalSync frames



No change at egress

Timescale conversion at ingress

