AV bridging:

Time-synchronization clocking

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RE-SG basic requirements

• Media friendly
  – Link-dependent time-sync intervals
  – Clock-master or clock-slave initiated

• Accurate
  – Errors limited by snapshot accuracies
  – Eliminate: gain peaking
  – Incorporate: per-stage low-pass filtering

• Responsive
  – RX: linkDelay—neighbor local-clock syntonization
  – TX: Minimal grandTime syntonization

• Simple
  – Minimal residence-time constraints
Cascaded TOD synchronization
(a nonscalable approach)

10 ms interval

0.0-2.5 ms delays

degraded intervals

7.5 – 12.5 ms intervals

0.0 – 30 ms intervals
Reclocked TOD synchronization
(a scalable approach)

10 ms interval
0.0-10.0 ms phase offsets
sustained intervals

7.5 – 12.5 ms intervals

7.5 – 12.5 ms intervals
Slave-triggered synchronization

(a more heterogeneous cascade)

10 ms interval

0.0-10.0 ms phase offsets

clock-slave triggered

7.5 – 12.5 ms intervals

37.5 – 40.5 ms intervals
Rate conversion overview

(decoupled processes)

(GM selection)

{txGrandTime, txTime} → rxAdjust

{rxGrandTime, rxTime} → txResample

{txGrandTime, txTime} → {txGrandTimed, txTime}
Gain-peaking suppression

(distinct calibration & deviation indications)
**Time formats**

grandTime (NTP RFC-1305, SNTP RFC-2030)

- **seconds**
  - >150 years

- **fractions**
  - <250 ps

**extraTime**
Interpolation concepts

(interpolation range)
Interpolation intervals

(interpolation range)

interpolation range

rx[n-N] rb[m] rx[n] tx[m]

↑ compTime = backTime

← backTime