NTP Interleaved Modes

draft-mlichvar-ntp-interleaved-modes-00
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Transmit timestamp (Tx)

- Tx can be captured:
  - NTP daemon
  - Network drivers
  - MAC layer (OSI)
  - PHY layer (OSI)
- in basic mode (RFC 5905), Tx captured at NTP daemon
- includes errors - processing and queuing delays.

NTP packet
For more accuracy

• Tx should be captured close to the wire, ideally at PHY layer

• difficult to implement in current packet

• RFC 5905 provides no specification for server to provide this more accurate Tx to clients/peers
Interleaved mode

- NTP packet contains a Tx corresponding to the previous packet sent to the client or peer.
- This draft formally specifies:
  - A new interleaved client/server mode.
  - Interleaved symmetric mode with some modifications to NTP reference implementation.
  - Interleaved broadcast mode based purely on NTP reference implementation.
Interleaved client/server mode

basic client/server mode

interleaved client/server mode
Interleaved client/server mode

Server state:
• for client: \((Rx, Tx)=(T2, T3)\)
• upon getting request:
  check if \(T2=?Rx\)

Client state:
• upon getting response:
  perform all tests as in RFC 5905
  &
  check if \(T4=?Rx\)
Interleaved client/server mode

Server:
- T2
- T3
- T6
- T7
- T10
- T11

Client:
- T1
- T4
- T5
- T8
- T9
- T12

Mode:
- Basic
- Interleaved

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Rx
Tx
- 0
- 0
- T1
- T2
- T3
- T1
- T4
- T2
- T1
- T3
- T4
- T6
- T5
- T6
- T8
- T5
- T10
- T11
Interleaved symmetric mode

- Similar to interleaved client/server mode.
- Modification from NTP reference implementation.
  - Additional restrictions to deal with:
    - unequal peer polling interval
    - packet loss
Interleaved broadcast mode

Based purely on NTP reference implementation.