

Precision Time Protocol

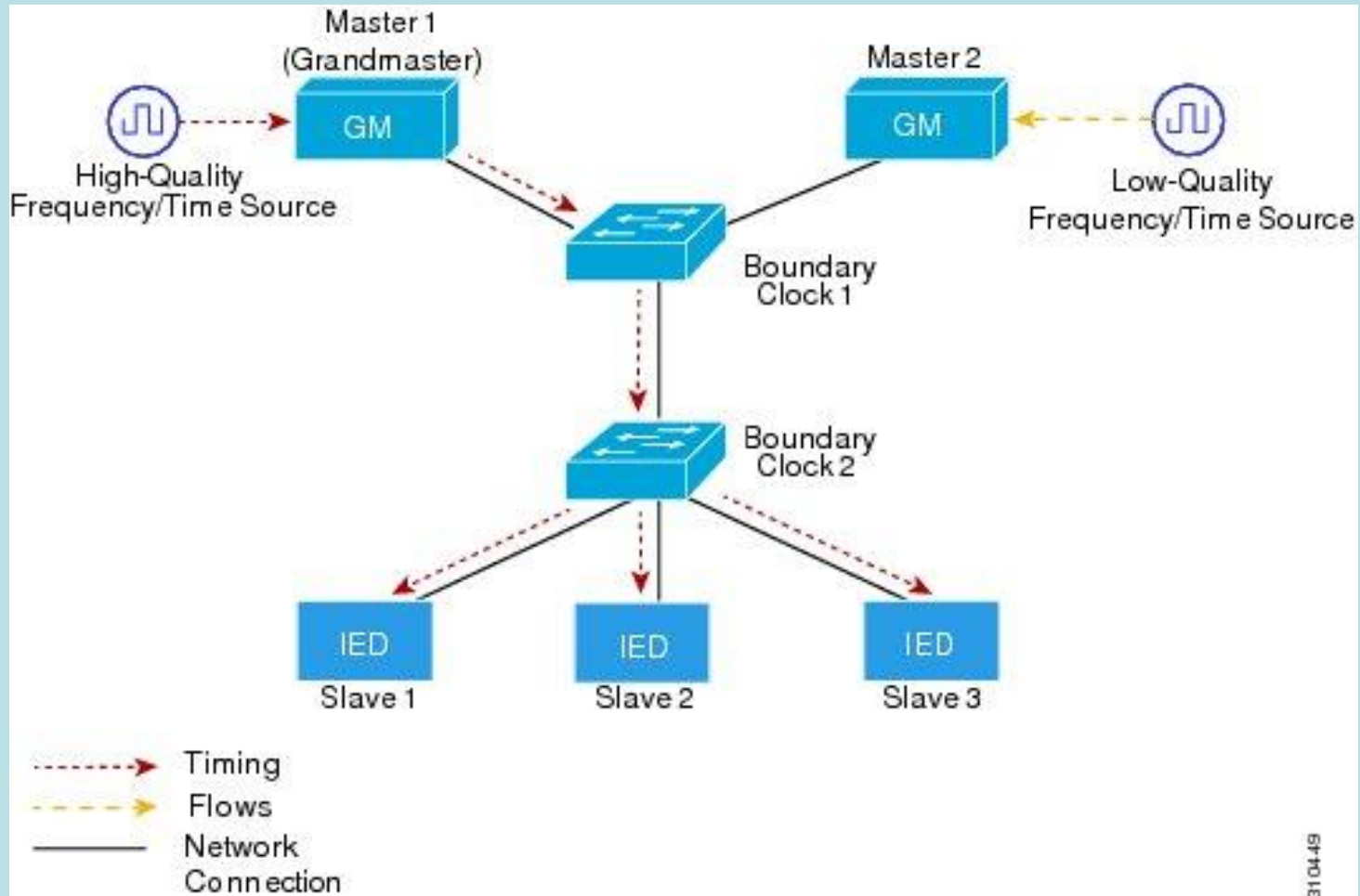
Why PTP?

- The benefits of using PTP in an Ethernet network include:
 - Low cost and easy setup in existing Ethernet networks
 - Very little network bandwidth is needed for PTP data packets

Ethernet Switches and Delays

- Adding PTP to a network can compensate for the latency and delay problems by correctly adjusting device clocks so that they stay synchronized with one another. PTP enables network switches to function as PTP devices, including boundary clocks and transparent clocks.
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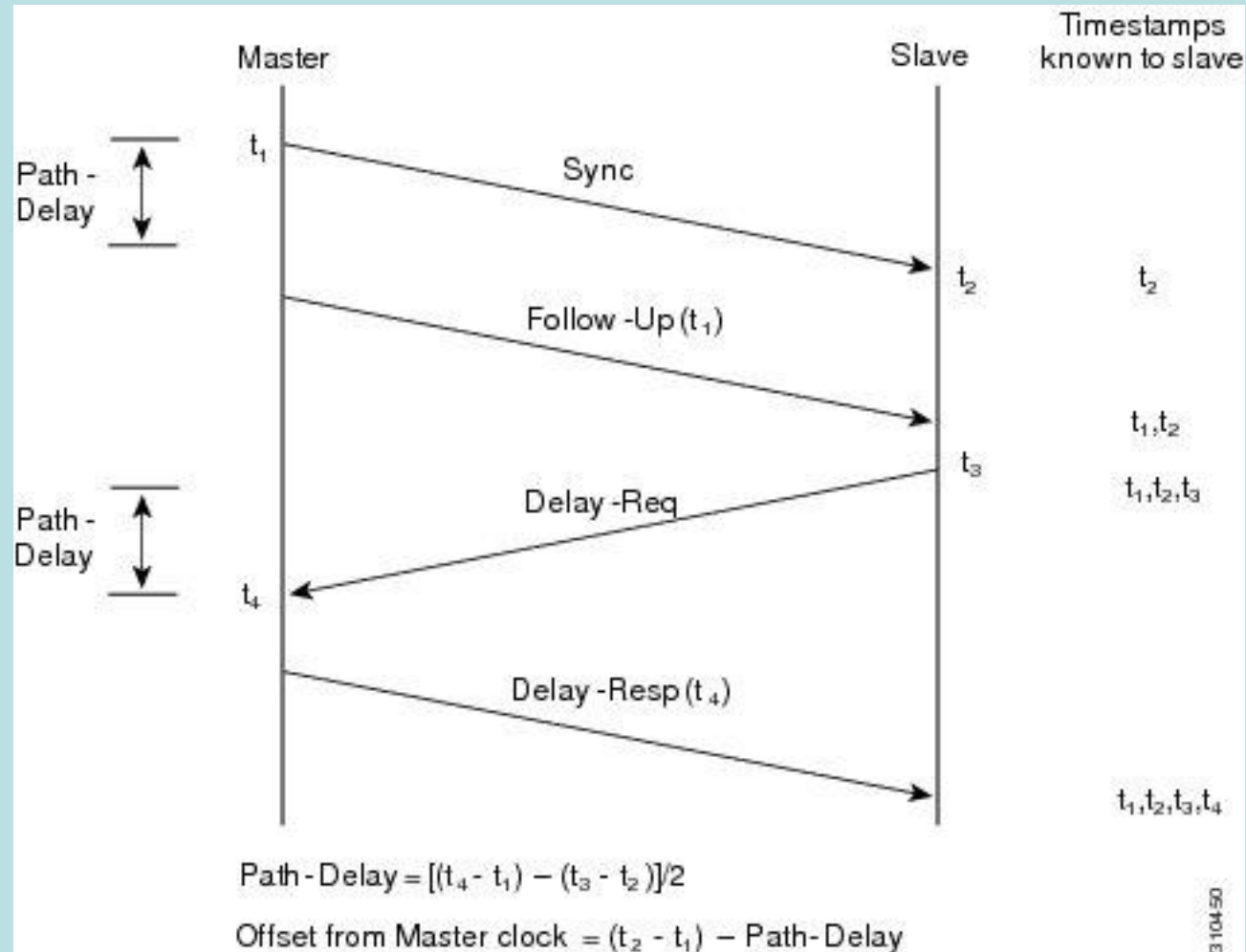
Message-Based Synchronization



Synchronizing with Boundary Clocks

- The ordinary and boundary clocks configured for the delay request-response mechanism use the following event messages to generate and communicate timing information:
 - Sync
 - Delay_Req
 - Follow_Up
 - Delay_Resp

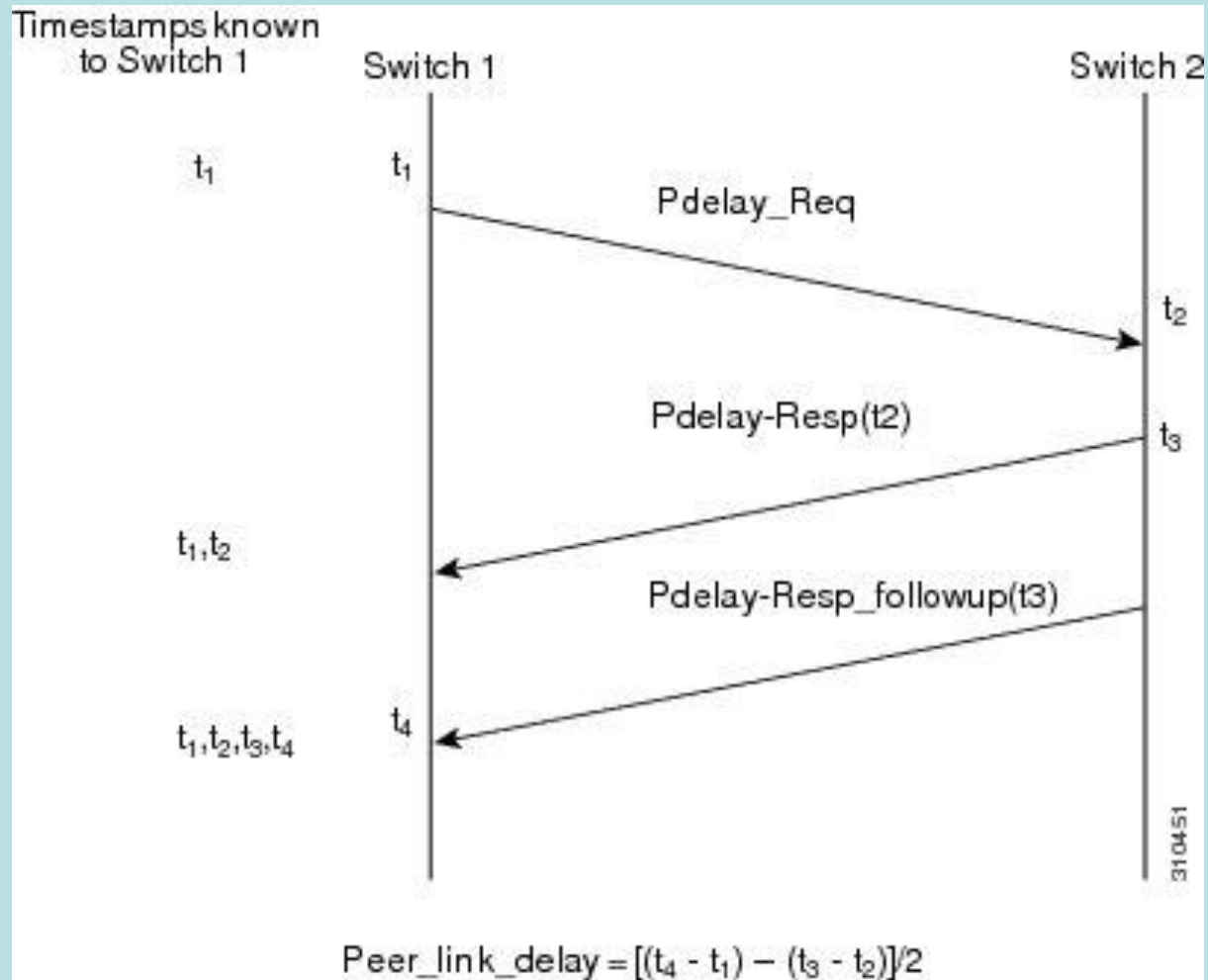
Detailed Steps—Boundary Clock Synchronization



Synchronizing with Peer-to-Peer Transparent Clocks

- Peer-to-peer transparent clocks measure the link delay between two clock ports implementing the peer delay mechanism. The link delay is used to correct timing information in Sync and Follow_Up messages.
- Peer-to-peer transparent clocks use the following event messages:
 - Pdelay_Req
 - Pdelay_Resp
 - Pdelay_Resp_Follow_Up

Detailed Steps—Peer-to-Peer Transparent Clock Synchronization



PTP Clocks

- A PTP network is made up of PTP-enabled devices and devices that are not using PTP. The PTP-enabled devices typically consist of the following clock types, which are described in this section:
 - Grandmaster Clock
 - Ordinary Clock
 - Boundary Clock
 - Transparent Clock

Linux PTP/Macnica PTP

- Linux PTP supports hardware and software time stamping via the Linux `SO_TIMESTAMPING` socket option.
- Macnica PTP supports software time stamping.
- There are no transparent clocks in the Macnica PTP network.