DXD

Basic PTP Troubleshooting

In its essence, PTP is a fairly simple method of synchronizing clocks on a network by exchanging messages. First, the devices on the network select a Grandmaster based on the information in the Announce messages. The Grandmaster then sends Sync messages to the Followers (or Slaves). And the Followers send Delay Request messages to the Grandmaster which responds by returning Delay Response messages. With timestamps attached to the different messages, the network delays can be calculated and the Followers' clocks adjusted. Pretty simple, right?

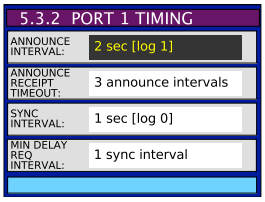
Keep in mind however that, for this to occur as designed, two things need to happen:

1. The timing of the Announce messages need to be the same on all devices.
2. The messages need to arrive at their intended destination.

• ANNOUNCE MESSAGES TIMING:

Using the BMCA (Best Master Clock Algorithm), a Grandmaster is chosen based on the information in the Announce messages (priorities, clock quality…). When no Announce message is received within the Announce Receipt Timeout time, it is assumed the Grandmaster is offline and another one is chosen.

For successful operation, all devices should have the same value for Announce Interval and the same value for Announce Receipt Timeout. It is easy to see that, with different values on the different devices, the BMCA will not function properly.



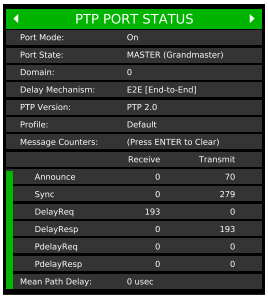
For more information, see "How to deal with multiple Grandmasters".

• PTP MESSAGES MUST ARRIVE AT THEIR INTENDED DESTINATION:

Announce messages are transmitted automatically to determine which device will be chosen as the Grandmaster. Sync and Delay Request messages are also transmitted automatically, for sync purposes. A Delay Response message on the other hand will only be transmitted after a Delay Request message has been received.

In a complex network, PTP messages may not arrive at their intended destination which will cause sync errors.

The PTP Port Status page on the DXD includes message counters indicating the number of messages transmitted and received by the DXD.



This should be the first thing to check when troubleshooting. Are PTP messages transmitted and received properly by the different devices on the network? If not, some network and switch settings should be checked, especially IGMP and DSCP values and priorities.

For more information, see "Advanced Networking Notes for the DXD Universal Clocks".