Uncovering
PTP Master Clocks in the Wild

The Precision Time Protocol (PTP) is a clock synchronisation protocol designed for local networks. Compared to the Network Time Protocol (NTP) it promises better accuracy with a sub-microsecond range. Even though it is specifically designed for local networks, so called master clocks are publicly available in the Internet. Triggered with the correct PTP message, these master clocks start sending PTP messages. As shown in the image, some clocks even initiate a connection that sends 1000 packets with a frequency of 1 pps. Because PTP promises a high accuracy, most of these clocks are attached to a precise time source, e.g. GPS. Knowledge about responsive clocks in the Internet, their location and their behavior provides a promising pool of precise time sources for future measurements.

The goal of this thesis is to find a possibility to identify PTP master clocks in the Internet and extend ZMAP to be used for active scans. After supervised scans in close collaboration with your advisors, the behavior of found master clocks should be analyzed and categorized.

- Develop an approach to effectively detect PTP capable device in the Internet
- Set up supervised scans based on ZMAP
- Extend a pcap library to parse PTP
- Analyze reachable PTP hosts

- Basic programming knowledge in Python or Go
- Familiarity with GIYF-Based work approaches

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