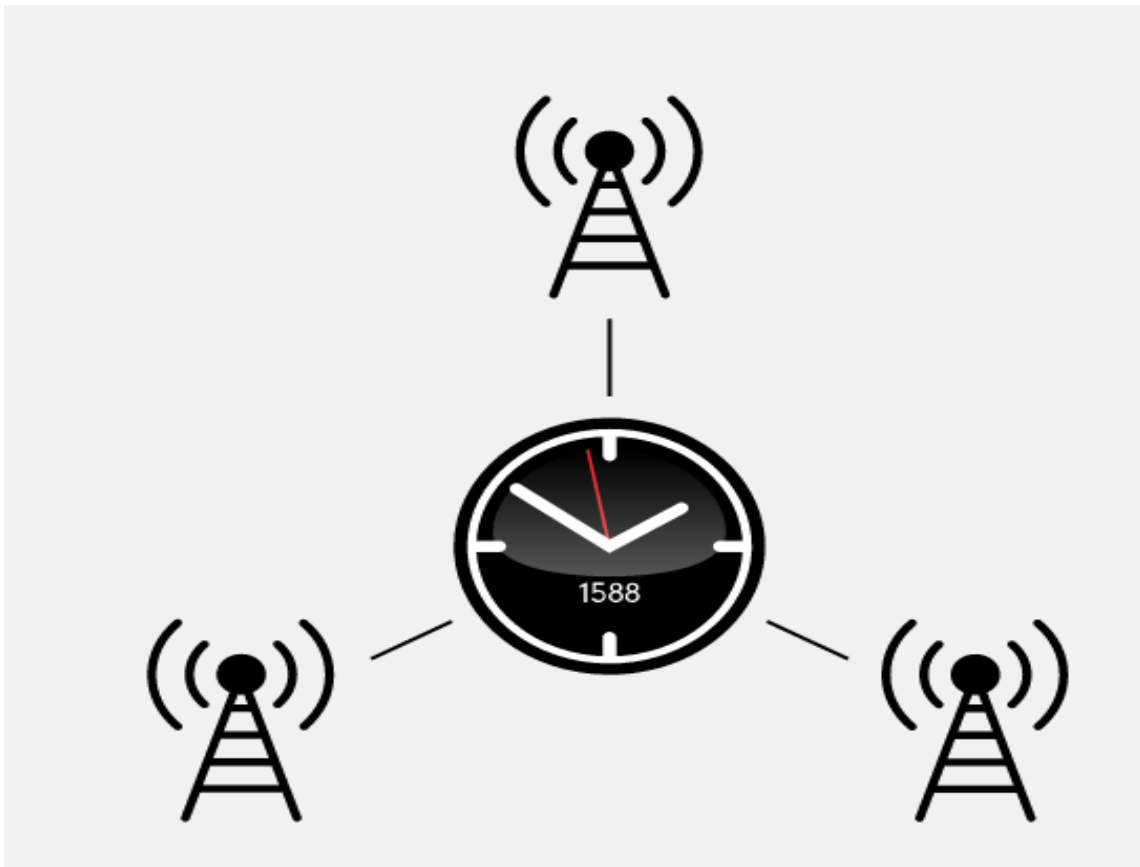


The IEEE 1588 Standard

Precision Time Protocol (PTP) for Synchronization



The PTP protocol defined in the IEEE 1588–2002 and IEEE 1588-2008 standards allows for precise synchronization of distributed networks. The packet based networks carry time stamps in standard Ethernet format. Accuracies from milliseconds to nanoseconds can be achieved using software or hardware generated timestamps. Qulsar is developing product platform support for this standards using its processor architecture which is very well suited for the time critical processing of the time stamps. More exact time and frequency synchronization can be achieved using its integrated hardware support.

In 2008 the second iteration of the standard was released, IEEE 1588-2008. This new standard is designed to cope with more complex networks and increased performance.

Already in April 2007 our company presented the first implementation at the ESC 2007 in San José. The device was one of the first optimized solutions in the market at that time where most of the implementations were based on FPGA technology. The release of the the first generation of the hardware timestamping platform and later the availability of the 1588 Protocol Stack from Zurich University Applied Sciences was the company's first product for this application. Today Qulsar products incorporate a leading implementation of the protocol standards known for its standards compliance and fast network response.

Applications - IEEE 1588 is of interest for many Deterministic behavior by network clients is of big importance in automation, motion control, military, measurement and numerous other applications. Ethernet equipped products are now becoming a commodity and the multitude of

nodes need to be synchronized as precisely as possible over the network.

New companies are addressing the vast need of synchronization by new add-on products replacing traditional, much more expensive technology. Especially the applications for power grids and telecommunication networks are of short-term interest for the market. The synchronization of new energy sources and smart grids base stations is necessary as the numbers increase to cope with demands for higher capacity.

Industrial support of IEEE 1588 Many groups in the industrial sector have decided to adapt the protocol in their Ethernet-based devices. The ODVA, www.odva.org, has decided to use IEEE1588 for CIPSync, the real-time extension for Ethernet/IP - CIP. There is an adaptation option made for Profinet. Companies in the test and measurement industry have been in the forefront in the development and adoption of the standard, see www.ixistandard.org for further reading. This organization has now adopted the IEEE 1588-2008 standard. More and more companies come from telecommunications and electrical power distribution.