REAL-TIME SIGNALLING IN NETWORKED EMBEDDED SYSTEMS

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Short Paper

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ABSTRACT

Distributed Interrupt mechanism has been proposed for next SpaceWire standard release. According to specification Interrupt codes and Interrupt_Acknowledge codes are low-latency signaling codes and their distribution does not depend on data flow, that makes it useful for real-time distributed systems interconnections. The distributed interrupts service provides applications ability to receive and to send distributed interrupt codes. Control codes, received from SpaceWire network, would be transmitted to user applications as real time signals, using standard POSIX Real time signals mechanism.

SpaceWire standard includes Time Codes mechanism, it was designed for the implementation of the time distribution service. Using time codes the time access service was developed, which provides a consistent application interface to a local time source that is correlated to some centrally maintained master onboard time source. As a source of distributed time applications access to the timer of OS with a standard POSIX interface, conforming to CCSDS 872.0-R-0.3 standard.

Discribed services were developed for Linux OS, which includes patches for running in soft real time. SpaceWire channels are presented as usual network devices, so all TCP/IP applications, using BSD sockets API, would work over SpaceWire without any change.