

EDF Scheduling Algorithm for Periodic Messages on Switched Ethernet

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Abstract: In the recent years, there is a strong interest of using switched Ethernet in factory automation. The switched Ethernet offers many attractive features such as large throughput, traffic isolation and full-duplex links. However, although using full-duplex switched Ethernet can limit the collisions to each port, the real-time features may be affected due to the collisions on an output port. This paper analyses the schedulability conditions for real-time periodic messages on a switched Ethernet where all nodes operate in a synchronized mode and also proposes a EDF (Earliest Deadline First)-based scheduling algorithm to support the real-time features of the periodic traffic over switched Ethernet without any change in the principles of switched Ethernet. The periodic traffic will be handled by a master node to enhance the real-time performance of switched Ethernet, thus satisfies the requirements of industrial communications.

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