A Method of Logically Time Synchronization for Safety-critical Distributed System

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(Pt9)Abstract— **Legacy real-time and embedded systems have been small scale and standalone. However, recently they are increasingly being connected to create large-scale distributed system. Such distributed embedded system is realized in automotive, medical, and manufacturing automation. Also, there are many researches about software platform for large-scale distributed system. Verification of the application is required in SW platform for safety-critical distributed system. However, the verification complexity increases in practice as several factors such as delay, jitter and error. An equivalent synchronized execution of distributed tasks are required in distributed real-time system. Our method is based on the PALS (Physically Asynchronous Logically Synchronous) which is a complexity-reducing architectural pattern for distributed real-time systems. It allows developers to design, verify and implement a logically synchronous implementation of real-time distributed applications. In this paper, we introduce a logical time synchronization for reducing complexity between distributed nodes in distributed embedded system. It make verification and development of distributed software easier. It is helpful to develop distributed embedded system which requires safety and reliability. This paper is useful for application programmer or system manager who wants to establish distributed embedded system which requires safety and reliability.**

(Pt9)Keyword— **Logical Time Synchronization, PALS, Middleware, Safe-Critical System, verification complexity**

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