C M Krishna Real Time Systems Pdf

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abstract. in this paper we present a new theory of stochastic processes which is useful in modeling the reliability of complex systems. the theory provides a more complete and intuitive description of a class of stochastic processes that are useful in modeling the reliability of such systems. we show that stochastic processes can be used to capture the resilience of a system against various types of fluctuations in the workload. we also propose a framework for the evaluation of real-time systems that use stochastic processes. we show that the real-time characteristics of a system can be captured using a set of non-negative random variables and that these random variables can be used to evaluate the reliability of a real-time system. in this paper, we present new measures for real-time system reliability. these measures are application-sensitive rather than application-centric, and are especially suitable for systems executing various applications with di erent attributes, some of which may not be known in advance. our proposed measures capture the capability of a real-time system to respond successfully to unexpected surges in the workload. these surges may result from a phase change in the system's mission, an application-related emergency situation or the failure of some system resources. the ability of the system to handle such surges determines, to a large extent, its chances of survival and meeting its applications'deadlines. the paper consists of 6 sections: the traditional reliability measures for computer systems can be classi ed into computer-centric or application-centric categories. the former concentrate on the hardware resources while ignoring the application's needs. the latter focus on the requirements of a speci c application which is being executed, thus requiring the knowledge of all the details of the application; information which may not always be readily available. also, the narrow view on the system's reliability through a single application is too restrictive and provides very limited information regarding the way the system will handle other applications. in this paper we present new measures for real-time system reliability. these measures are application-sensitive rather than application-centric, and are especially suitable for systems executing various applications with di erent attributes, some of which may not be known in advance. our proposed measures capture the capability of a real-time system to respond successfully to unexpected surges in the workload. these surges may result from a phase change in the system's mission, an application-related emergency situation or the failure of some system resources. the ability of the system to handle such surges determines, to a large extent, its chances of survival and meeting its applications'deadlines. the paper consists of 6 sections:

shared data structures are data structures shared by different real-time tasks. these data structures are designed to reduce synchronization costs. hence, the shared data structures provide temporal coherence for real-time tasks. this paper shows how to use shared data structures to realize hard real-time systems on multiprocessor platforms. amit kumar, venkatesh sambamurthy, ramakrishna sunkar, real time control systems for hard real-time systems on multi-core platforms: a survey , in proceedings of the 13th international symposium on modeling and simulation for computer, communication and energy efficient systems, pp. 1-6, springer, doi: 10.1007/978-3-319-00379-9_11, 2012. [pdf] this paper surveys recent advances in real-time control on multi-core platforms and the challenges posed by real-time systems on multiprocessor platforms. the paper also surveys real-time control approaches for hard real-time systems. marina spichkova, experimental evaluation of a vlsi implementation of balanced clock domains for hard real-time systems on smp platforms, performance evaluation of a vlsi architecture for hard real-time systems on smp platforms, ph.d. thesis, dept. of computer science, stanford university, 2007. [pdf] in this thesis, the development and the analysis of a vlsi architecture for hard real-time systems on smp platforms is described. the thesis presents a hard real-time architecture and a vlsi implementation of that architecture. this paper presents a survey of execution models for real-time systems. it discusses existing execution models and their applicability to specific problem domains and environments. it surveys the existing real-time execution models and presents a taxonomy of the real-time execution models. 5ec8ef588b