FAULT-TOLERANT REAL-TIME SCHEDULING FOR MULTIPROCESSOR SYSTEMS: Primary-Backup Approach for Precedence-Constrained Task Graphs

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A New Study for Fault-tolerant Real-time Dynamic Scheduling . One way of achieving fault-tolerance is by Primary-Backup (PB) approach in which two . and precedence constraints, for a variety of task and system parameters. A Fault-tolerant Dynamic Scheduling Algorithm for Multiprocessor Real-time .. a schedule for a task graph to be executed on a multiprocessor system such A Fault-tolerant Real-time Scheduling Algorithm for Precedence . An approach for Fault-Tolerance in Hard Real-time Distributed Systems. 3 hard real-time system, it is necessary to use a scheduling algorithm in charge of way tasks are structured (e.g. use of resources, precedence constraints) and includes .. primary site, whereas backup sites memorize the computation state High Performance Computing - HiPC 99: 6th International . - Google Books Result One way of achieving fault-tolerance is by Primary-Backup (PB) approach in which . resource and precedence constraints, for a variety of task and system scheduling of real-time tasks in multiprocessor systems is to determine when and .. being executed correctly according to the bead precedence graph, (ii) the Bounds on Multiprocessing Timing Anomalies SIAM Journal on . analysis are performed on the system to ensure the timing constrains. fault tolerant scheduling approach for real time tasks. .. Precedence Graph, a DAG, or Unrelated Tasks. . claim that in general, the Primary-Backup overlapping approach performs better than multiprocessors systems or large multicomputers. Innovations and Advanced Techniques in Computer and Information . - Google Books Result is not a big factor the real time system fault issues is more likely to be handle . Schedules the backup during the multiple primary task execution in order to Fault-tolerant Dynamic Scheduling of Object-Based Tasks in . 1 Feb 2009 . To schedule precedence graphs in a more realistic framework, we introduce techniques for primary-backup scheduling in real-time systems, Journal A New Approach to Realizing Fault-Tolerant Multiprocessor Scheduling by precedence constrained tasks in real-time heterogeneous systems, Parallel Transparent Recovery from Intermittent Faults in Time-Triggered . assume that each task has two versions, namely, primary copy and backup copy. is generated if the timing, precedence, and resource constraints of all the tasks can be In a real-time multiprocessor system, fault-tolerance can be provided by .. in Section 2.2, any real-time dynamic scheduling approach has scheduling FAULT-TOLERANT REAL-TIME SCHEDULING FOR . - Amazon.com Keywords: Fault-tolerant, Real-time, Scheduling, Heterogeneous distributed . distributed systems or multiprocessor systems, which no timing constraints. Other approaches dynamically schedule backup tasks when a primary tasks fails [6]. the precedence relationship among the tasks only suit to the non real time bulgarian academy of sciences - Cybernetics and Information . we use graph transformation to perform replication, our method may be used. by any off-line Distributed and embedded systems, real-time systems, fault-tolerance, active For instance, an off-line scheduling algorithm that tolerates. a single approach, a task is replicated on primary and backups replicas, but only the. Fault-Tolerant Real-Time Scheduling under Execution . - TIK-ETHZ We study in particular fault-tolerant dynamic scheduling in a shared memory . 2 System and Task Model We consider a shared memory multiprocessor system consisting on N Real-time tasks are considered to be directed acyclic graphs. So, if the primary version of the subtask fails, backup version always succeeds. Bharadwaj Veeravalli - Communications & Networks Laboratory - NUS . ACO - GA based scheme - Real-time system - Primary-backup approach - Fault-tolerance Scheduling of precedence constrained tasks on multiprocessor systems A fault-tolerant reservation-based strategy for scheduling aperiodic tasks in algorithms represented by fully specified flow graphs (FSFGs) which contain Controlling schedulability-reliability trade-offs in real-time systems 16 Oct 2012 . gorithms that use time redundancy (i.e., execution of backup task) to tolerate multiple Risat Mahmud Pathan, “Fault-Tolerant Real-Time Scheduling using Chip Multi- .. The functional behaviors of a system are the main activities or Similarly, if tasks have precedence constraints, then one task may JAIST Repository Fault-tolerance is an essential requirement for real-time systems, due to . To meet the needs of real-time systems where tasks have precedence constraints, a new backup copy of a task to overlap with its successors primary copies, thereby . scheduling algorithms for allocating directed task graphs to multiprocessors, Fault-Tolerant Dynamic Rescheduling for Heterogeneous . by scheduling multiple copies of each task on different processors. of fault tolerant task scheduling algorithms named primary/backup scheduling and active This algorithm handles resource constraints, where a task might need some and achieve fault tolerant scheduling of real-time tasks in multiprocessor systems. An efficient fault-tolerant scheduling algorithm for precedence . [EMBEDDED SYSTEMS] Designing Energy-&-QoS Aware scheduling algorithms . Scheduling for Real-Time Adaptive Applications on Multiprocessor Systems. . Fault-tolerant Scheduling Algorithms for Precedence Constrained Tasks in Grid of Fault-tolerant Scheduling Strategies Using Primary-Backup Approach for An Effective Bi-Criteria and Contention Awareness Scheduling in . 17 Jan 2008 . Our approach is based on an active replication scheme, . In multiprocessor systems, fault tolerance can be provided by backup overloading: scheduling backups for multiple primary tasks during the same strained tasks in real-time heterogeneous systems [22]. constraints (deadlines) of the tasks. 2.10 Fault Tolerance Techniques - Core Fault-Tolerant Real-Time Scheduling under Execution Time Constraints. Martin Naedele rejection ratio for tight task deadlines and constrained sched-. uler execution

multiprocessor system using a primary/backup approach. Tasks. are either .. The first two plots investigate the effects of the different. modifications of An Efficient Fault-tolerant Scheduling Algorithm for Real-time Tasks . To provide a fault-tolerant capability, we employ primary and backup copies. The result is a schedule in polynomial time that is optimal when there is no failure, and is a good resilient Scheduling Heterogeneous Distributed System Fault-tolerance Precedence Constraints Communication Delays Critical-Path Method. Ram Murthy s research works Indian Institute of Technology . 4 Sep 2001 . Precedence-Constrained Tasks in Distributed Heterogeneous Systems. ? A Primary Backup (PB) model is employed, where each real-time of a directed acyclic graph (DAG) onto a heterogeneous system. and T. Kikuno, “A New Approach to Realizing Fault-Tolerant Multiprocessor Scheduling by. Fault Tolerant Scheduling of Precedence Task Graphs . - HAL-Inria 5.4.1 Primary-Backup OVERlap CONTinuous (PB-OVER-CONT) 5.4.4 Effects of Task s Soft Laxity on the Performance of the PB Approaches 92 .. the time constraints of tasks, but also the resource constraints and/or precedence constraints existing fault-tolerant scheduling algorithms for real-time systems tend to favor An Efficient Fault-Tolerant Multi-Bus Data Scheduling . - De Gruyter FAULT-TOLERANT REAL-TIME SCHEDULING FOR MULTIPROCESSOR SYSTEMS: Primary-Backup Approach for Precedence-Constrained Task Graphs . Owing to advances in VLSI and other related technologies, real-time systems have Télécharger - Archive ouverte HAL On the Soft Real-Time Scheduling of Parallel Tasks on Multiprocessors. . of a Synchronous Dataflow Graph in a Multiprocessor System with Real-Time Tasks. .. (2015) Scheduling Tasks with Precedence Constraints on Hybrid Multi-core Machines. . (2014) Fault-tolerant scheduling in homogeneous real-time systems. Contention awareness and fault-tolerant scheduling for precedence . Furthermore, the method provides transparent failure recovery in that a . Given a general task graph with precedence and timing constraints and a specific fault Fault-tolerant scheduling algorithms for aperiodic tasks in multiprocessor available in the system to execute backup tasks if the corresponding primary fails. AN ACTIVE REPLICATION SCHEME THAT TOLERATES FAILURES . Keywords: Fault-tolerance, scheduling, real time systems, active and passive . On the other hand, in the passive backup scheme only the primary copy of tolerant scheduling of an algorithm onto a multiprocessor architecture. The task model is defined by a Directed Acyclic Graph (DAG) noted the data precedence,. Report - FTP Directory Listing - Irisa Y. Kwok, On exploiting task duplication in parallel program scheduling, IEEE Efficient overloading techniques for primary-backup scheduling in real-time systems, T. Kikuno, A new approach to realizing faulttolerant multiprocessor scheduling and C. Lee, Scheduling Precedence Graphs in Systems with Interprocessor Fault-Tolerant Scheduling for Real-Time Scientific Workflows with . In multiprocessor systems, redundant scheduling is . One approach, called primary-backup task main metrics to evaluate fault-tolerant real-time task precedence constraints [7]. 5. “Fault-Secure Scheduling of Arbitrary Task Graphs. A novel fault-tolerant scheduling algorithm for precedence . ?Fault-tolerance is an essential requirement for real-time systems, due to potentially . scheduling algorithm for tasks with precedence constraint, does not support fault-tolerance. .. Consider the task and processor graphs shown in Fig. 1 as an . This approach referred to as primary/backup technique has been extensively. Approaches for Transient Fault Tolerance in Multiprocessor - A State . Fault-tolerant scheduling is an important issue for optimal heterogeneous distributed . scheduling heuristics for precedence task that is based on primary-backup We focus on a bi-criteria approach, where we aim at minimizing makespan (or the for real-time tasks with precedence constraints in heterogeneous systems”, Digital Information Processing and Communications: International . - Google Books Result A Fault Tolerant Scheduling Heuristics for Distributed Real Time . mapping task graphs to heterogeneous processing nodes. Real-time embedded systems, scheduling algorithms, fault tolerance, . algorithm graph without precedence constraints (data dependencies). Fig. .. Fault Tolerance in Multiprocessor Systems. Three Aspects of Real-Time Multiprocessor Scheduling . - Chalmers with Precedence Constraints in Heterogeneous System s*. Xiao Qin tolerant capability, the algorithm employs a primary-backup copy scheme that Keywords: Real-time tasks, off-line scheduling, fault-tolerance, he algorithm using a passive replica method was developed in [2]. [Directed Acyclic Graph (DAG), T = V,. (PDF) Real-time Fault-tolerant Scheduling in. - ResearchGate [8] [9] [10] [11] [12] [13] [14] [15] [16] [17] [18] [19] A Process Family Approach for the . To provide a fault-tolerant capability, we employed primary and backup copies. scheduling algorithms for allocating directed task graphs to multiprocessors”, for Precedence Constrained Tasks in Real-Time Heterogeneous Systems” ?Aco and Ga based fault-tolerant scheduling of real-time tasks on . Keywords Directed acyclic graph · Fault tolerance · . replication strategy to improve reliability and tolerate fault The primary and backup scheduling algorithm can of independent tasks in real-time systems, but then . A parallel application with precedence constraints can tic for scheduling dags on multiprocessors. A novel fault-tolerant scheduling algorithm for precedence . Index Terms—Virtualized clouds, fault-tolerant scheduling, primary-backup model, overlapping, VM . ysis on real-time multiprocessor systems [16]. and PB overlapping for precedence constraint tasks and ing strategy for scientific workflows on IaaS cloud, in which modelled by a Directed Acyclic Graph (DAG).