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Critical task re-assignment under hybrid scheduling approach in multiprocessor real-time systems
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Abstract
Embedded hard real time systems require substantial amount of emergency processing power for the management of large scale systems like a nuclear power plant under the threat of an earth quake or a future transport systems under a peril. In order to meet a fully coordinated supervisory control of multiple domains of a large scale system, it requires the scenario of engaging multiprocessor real time design. There are various types of scheduling schemes existing for meeting the critical task assignment in multiple processor environments and it requires the tracking of faulty conditions of the subsystem to avoid system underperformance from failure patterns. Hybrid scheduling usually engages a combined scheduling philosophy comprising of a static scheduling of a set of tasks and a highly pre-emptive scheduling for another set of tasks in different situations of process control. There are instances where highly critical tasks need to be introduced at a least expected catastrophe and it cannot be ensured to meet all deadline in selected processors because of the arrival pattern of such tasks and they bear low tolerance of time to meet the required target. In such circumstances an effective switching of processors for this set of task is feasible and we describe a method to achieve this effectively.

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