Instructions for Authors of SBC Conferences Papers and Abstracts

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Abstract.

Resumo.

1. Introduction

2. Related Concepts

2.1. Time

It's important to understand what is time and it's related concepts. For this purpose, the definitions provided by [Kopetz 2011] will be considered:

1. The flow of time is a directed time line that extends from the past into the future.
2. A cut of the time line is called an instant.
3. Any ideal occurrence that happens at an instant is called an event.
4. The present point in time, now, is a very special event that separates the past from the future.
5. An interval on the time line, called a duration, is defined by two events, the start event and the terminating event of the interval.
6. The instant when a result must be produced is called a deadline.

In the context of deadlines, [Kopetz 2011] also provides a good definition, classifying them in three different ways:

1. Soft deadline: If a result has utility even after the deadline has passed,
2. Firm deadline: If a result does not matter after the deadline.
3. Hard deadline: If severe consequences could result if a firm deadline is missed.

2.2. Real-time systems

For [Kopetz 2011], a real-time computer system is a computer system where the correctness of the system behavior depends not only on the logical results of the computations, but also on the physical time when these results are produced. [Lichtenstein et al. 1985] states that a real-time system is a reactive system, that is, it must react to stimuli from its environment within time intervals dictated by its environment. According to [Stankovic and Ramamritham 1990], a real-time computer system can be classified in 2 different ways:

1. Static real-time system: where all deadlines can be guaranteed a priori.
2. Dynamic real-time system: large, complex, distributed, adaptive, contain many types of timing constraints, need to operate in a highly nondeterministic environment, and evolves over a long system lifetime.

The type of the deadline affects the real-time system. If the system must met at least one hard deadline, it's called a hard real-time computer system. If no hard deadline exists, then the system is called a soft real-time computer system. The design of a hard real-time system is fundamentally different from the design of a soft real-time system. While the first must sustain a guaranteed temporal behavior under all specified load and fault conditions, it is permissible for the second to miss a deadline occasionally [Kopetz 2011]. [Stankovic 1996] also points that hard real-time systems usually cause several consequences, even death, when missed an important deadline.

2.3. Tasks

For [Stankovic 1996] tasks can be classified as:

1. Periodic task: activated every T units. The deadline for each activated instance may be less than, equal to, or greater than the period T.
2. Aperiodic task: activated at unpredictable times.
3. Sporadic task: an aperiodic task with the additional constraint that there is a minimum interarrival time between task activations.

Real-time scheduling is the process of creating start and finish times for sets of tasks such that all timing, precedence, and resource constraints are met.

3. Proposal

4. Experiments and Evaluation

5. Conclusion

Referências

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