Fundamentals of Fault-Tolerant Distributed Computing in Asynchronous Environments

Name

Class

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Fundamentals of Fault-Tolerant Distributed Computing in Asynchronous Environments

What problem does the paper address?

The paper addresses a problem that increased reliance of society on well-functioning and well developed computer system has resulted into a greater urge for dependable systems that have reliable and quantifiable characteristics.

Till the start of 1990s, research on fault tolerant computing has laid increased emphasis on particular kind of applications and technologies, which eventually resulted in independent sub disciplines with different methodologies and concepts. Although efforts have been made to integrate its concepts, it still appears to be highly fragmented. Therefore, individuals who access the field appear to feel highly frustrated at times.

What are key paper's insights?

The paper has made use of the formal strategy to describe significant concepts like redundancy, fault tolerance and fault. This has enabled the researcher to identify four different kinds of fault tolerance and two major stages to acquire them: correction and detection. This enabled the researcher to demonstrate inherently important systems that make important contribution in integrating and gaining a deeper insight into the concept of fault tolerant distributed computing system.

It has been reported that matter is further complicated by the occurrence of fault possibility, but faults should be controlled in order to ensure reliability and dependability that is highly essential in different practical applications. However, the benefits of a formal strategy, however, is present in the fact that it reported some limitations of fault tolerance methods and their communication with system models.

What are paper's key scientific and technical contributions?

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The paper has described state machine approach in which replication of servers are made, as a result of which they become fault tolerant and their behavior is coordinated through the use of consensus algorithms. It has further been reported that it is easier to carry out corrections in local scenarios. For instance, once the identification of single bit error takes place across the line of communication, it is possible to correct situation through data retransmission. In retransmission, the correction will occur that will give rise to a situation in which data is correctly received.

What are its shortcomings or flaws?

The article did not provide any practical implications of the research paper. Moreover, it has not characterized current information technology in the light of fault classes and models. Moreover, the research lack behind in conducting qualitative or quantitative analysis of the paper. The researcher should have collected data from target audience to analyze and define the concept in more detail. The paper also did not included a separate methodology section that might have helped readers in understanding the method being followed by the researcher.

Discussion Questions

Following discussion questions have been proposed for the current research study.

1) How the simulation and evaluation of practical system is carried out?
2) How the task of maintaining, implementing and designing fault tolerant distributed systems can be eased?

Reference

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Gartner, F. C. (1999). Fundamentals of Fault-Tolerant Distributed Computing in Asynchronous Environments. *ACM Computing Surveys*, 31 (1): 1-26.

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