A Review on Mobility in Distributed System

[1]Harpreet Kaur, [2]Usvir Kaur
[1,2]Dept. of CSE, SGGSWU, Fatehgarh Sahib, Punjab, India

Abstract
Distributed computing system consist of various autonomous computers, each computer perform some part of whole task, to get the result more quickly as compared to single computer. "Mobility is the one of the problem in the Distributed system which is discussed in this paper". Though mobile agents offer much more flexibility, but it has some additional costs and issues such asreliability, security, and fault tolerance which required to be addressed for successful adaptability of mobile agent technology for developing real life applications. In distributed system the master node divide the overall task into slave nodes but when the mobile node moves during task execution then the master node reallocate the task by selecting the best candidate node.

Keywords
Distributed System, Fault Tolerance, Task Reallocation, and Multiagent System

I. Introduction

Distributed computing system is a combination of multiple computers where each computer has its own capabilities and speeds which results in heterogeneous nature of distributed system [1]. In distributed system the task is not performed by a single node instead of it the task is divided into various parts by the initiator agent and allocated to the sub nodes which results in parallel execution of the task due to which, we get the results more quickly. The task is said to be accomplished successfully, if all the resources required by that task is available, allocated agents are available and free to perform the task and the task is completed within its deadline without any conflict [2].

The main advantage of distributed system is that the task is performed by multi-agents which results in better response time and high performance. The presence of mobile agents in distributed system results in higher flexibility. Distributed system provide us the facility of openness which means to what extent a system is designed using standard protocols to provide interpretability. Distributed system results in reproducibility of events [3].

The main characteristics of DCS that if one sub node fails while performing the task, it does not affect the other nodes and the task is executed by other nodes until it completes, it results in high.

A. Challenges of Distributed System

The main challenge of distributed system is fault. It refers to disturbance in network. It mainly affects the normal behavior of network. Fault tolerance is the ability of a system to respond properly to an unexpected hardware and software failures. Delay is also the biggest challenge. It occurs due to the inefficient distribution of network load which leads to increase in network delay. In distributed system it is difficult to provide the good quality of service because of the mobile devices; it is difficult to establish dedicated links. In distributed system communication between the nodes is very high which results in large number of message exchange between nodes. An additional threats to agents systems due to the failure originating from bad communication, security attacks, agent server crashes, system resource unavailability, network congestion or even deadlock situation. In such events, mobile agents either get damaged (partially or totally) or lost during execution [4].

B. Architecture of Distributed System

In distributed system multiple autonomous computers are connected to each other through a communication network, among all the nodes, one node act as a master node or initiator agent which performs task allocation to the sub nodes that are suitable or capable of performing the task.

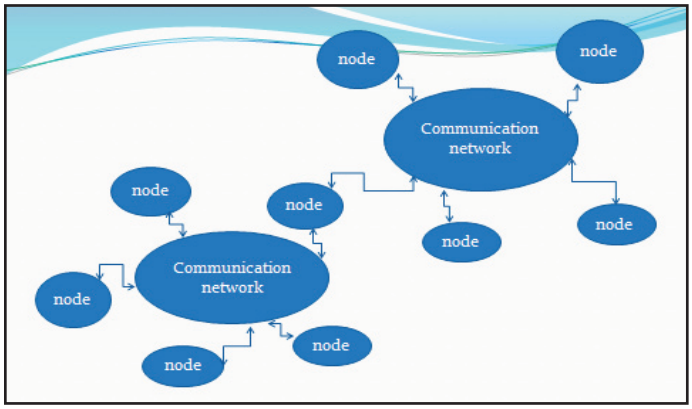

Fig. 1: Distributed System

II. Fault tolerance in Distributed System

Fault tolerance describes a component or computer system that is designed in a way that in the event if a component fails, a backup procedure or component can immediately take its place with no loss of service. A highly fault-tolerant system might continue at the same level of performance even though one or more components have failed.It is the capability of a system to respond gracefully to an unexpected software and hardware failure.Fault tolerance is a major concern to guarantee reliability and availability of critical services as well as application execution. Fault tolerance is very good method that provide us greater reliability by applying group of hardware like processors resources and communication host [5].

Faults can be classified into one of three categories:

A. Transient Faults

These faults occur once and then vanish. For example, a network message doesn't reach its destination but does when the message is redeliver.

B. Intermittent Faults

Intermittent faults are characterized by a fault occurring, then disappearing again, then reoccurring, then disappearing. These can be the most annoying of component faults. A loose connection is an example fault.

C. Permanent Faults

This type of failure is persistent: it continues to exist unless the faulty component is repaired or replaced. Some examples are disk head crashes, software bugs, and burnt-out power supplies.

III. Literature Survey

Zhongkui Li et.al(2013)[6] in this paper distributed tracking control problem for multi-agent systems with diversified uncertainties and a leader whose control input will be nonzero and not available to any follower. Both distributed continuous static and adaptive controllers have been designed to guarantee the uniform boundedness of the tracking error for each follower.

Asma Insaf Djebbar et.al(2007)[7] presented in this paper a service for faults tolerance which describes an algorithm of modeling in group in Ad hoc networks for then applying the tolerance to the faults by replication which is based mainly on the prediction.but this service of fault tolerance needs to be implement in a simulator of network Ad hoc such as NS2 or GloMoSim.

Rajwinder Singh et.al(2013)[4] proposes a novel parallel checkpointing algorithm in mobile agent systems. By recording the dependency relation in mobile agents in antecedence graphs we can reduce the time latency for a global checkpointing and we can enhance the applicability of fault tolerance approach using antecedence graphs for mobile agent systems.

Vahid Ebrahimirad et.al(2013)[8] Al describes Scheduling algorithms used in the data centers have focused on enhancement of performance metrics. The algorithm decreases energy consumption of the computation and communication by dynamic voltage frequency scaling (DVFS) and task packing.

Mobile Agent technology is the powerful of the agent, to know where the agent is and what is it mechanism to improve the flexibility. The architecture proposed in this paper satisfy all the requirements that can be used to extend to give a secure and reliable architecture.But in future authentication centers can be added at different levels and security properties of the proposed protocol can be verified, its performance with respect to time required for the verification and in terms of of simplicity ,usability ,accuracy and efficiency can be evaluated[9].

An approach used for task allocation in Distributed Processing Environment provide efficient solution to the dynamic allocation problem and an optimal allocation has been obtained with phase wise optimal costs [1].

IV. Conclusion

It is concluded that the tasks among the nodes should be allocated carefully. In this paper, existing techniques of handling mobility are discussed which has limitations such as communication overhead, more delay in message exchange,more fault detection time in network, more resource consumption and maximum failure rate to execute allocated task. In future, we would try to develop such technique using Multi-agent algorithm that leads to reduce the processing time, decrease delay and less message exchange and try to overcome other limitations as well.

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