Software-as-a-Service using Heterogeneous Distributed System for User Specific Applications

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ABSTRACT

In this paper, major goal is to achieve distributed environment configuring heterogeneous system framework using existing machines and high-end workstations as servers without involving extra cost. Feasibility of proposed system network is main concern in this paper having cost minimization. Data replication is responsible for enhancing dynamic scheduling in run-time. Dynamic scheduling is going to be exploited determining possible sub-network and related servers for specific user targeted tasks using active status and busy status of servers. Server-side background mode of operation is to be conducted for accessing dedicated or non-dedicated servers. Minimization of time and maximization of speed are objectives of proposed system structure.

Keywords: Data Replication, Distributed Computing, Distributed Environment, Distributed System, Heterogeneous Network, Software-as-a-Service (SaaS)

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INTRODUCTION

Heterogeneous distributed system for user specific applications is essential in today’s world where multiple services are going to be executed using sharing modes of resources having distinct configurations. Therefore numbers of processes are to be executed in different angles within the system network. The use of concurrent processes that communicate by message-passing has its roots in operating system architectures studied in the 1960s. The first widespread distributed systems were local-area networks such as Ethernet that was invented in the 1970s. E-mail became the most successful application of ARPANET, and it is probably the earliest example of a large-scale distributed application. In addition to ARPANET, and its successor, the Internet, other early worldwide computer networks included ‘Usenet’ and ‘FidoNet’ from 1980s, both of which were used to support distributed systems. Distributed system means a computer system containing a group of independent computers connected by a network and equipped with software that allows computers to synchronize their activities and to distribute the resources of system hardware, software, and data, so that users distinguish a separate, integrated computation skills. The computers that are in a distributed system can be physically close together and connected by a local area network, or they can be geographically distant and connected by a wide area network (Andrews, 2000).

Main Goal

Main goal is to achieve distributed environment having heterogeneity using proper data replication in a synchronized way exploiting dynamic scheduling.

Motivation

Distributed computing in a heterogeneous network environment has become an attractive option for delivering high performance on a range of applications. Distributed processing has been based on advances in technology areas like local-area and wide-area high performance networking. Existing application packages enable network based distributed processing, task multi-programming, and compilation techniques for distributed-memory multiple instruction multiple data (MIMD) computers.

RELATED WORKS

Distributed performance computing (Buschmann, Henney, & Schmidt, 2007; Spinnato, Albada, & Sloot, 2004) in heterogeneous systems employs the distributed objects as applications (Radojevic, Salcic, & Roop, 2011). These applications are arranged in such a manner that the same type of user requests can be executed in distinct machines which are situated in different locations. Sometimes, these machines fall in the same group or cluster at same location (Liu, Xiao, Liu, Ni, & Zhang, 2005). Huge collection of heterogeneous resources offers an opportunity for delivering high performance on a range of applications. Successful scheduling of system resources achieves high performance (Xu, Tang, & Lee, 2006). Formation of distributed network requires transferring information in a high speed (Eckart, He, Wu, & Xie, 2010). High performance can be achieved using cluster of workstations (Pakin, 2007). These workstations can be of similar types or distinct types in respect of configurations. Therefore, practical situation of the distributed network needs multi-processing power within the network activities to speed-up the task with synchronization (Arcangeli, Cao, McKenney, & Sarma, 2003; Hart, McKenney, & Brown, 2006). Whenever a transaction is taking place in a server-side machine for a particular process, all other processes would wait till its completion (Dice, Shalev, & Shavit, 2006; Herlihy, 2005). Another important point is transactional memory and garbage collection comparison which is dealt in (Grossman, 2007). Proper management of central processing unit, memory and network bandwidth is required while the external users access server-side resources having limitations (Urgaonkar & Shenoy, 2004).
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