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SUPERIOR HIGH PERFORMANCE WEB VASED COMPUTING SERVICES FOR TELEMEDICINE DATABASE

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Abstract

Many web computing systems are running real time database services where their information change continuously and expand incrementally. Web data services have a major role and draw significant improvements in monitoring and controlling the information truthfulness and data propagation. Currently, web telemedicine database services are of central importance to distributed systems. However, the increasing complexity and the rapid growth of the real world healthcare challenging applications make it hard to induce the database administrative staff. It builds an integrated web data services that satisfy fast response time for large scale Tele-health database management systems. This focus will be on database management with application scenarios in dynamic telemedicine systems to increase care admissions and decrease care difficulties such as distance, travel, and time limitations. It proposes three-fold approach based on data fragmentation, database websites clustering and intelligent data distribution. This approach reduces the amount of data migrated between websites during applications'execution; achieves cost effective communications during applications'processing and improves applications response time and throughput.

Key Words: *web computing, clustering, intelligent data distribution, data migrated.*

1. INTRODUCTION

The rapid growth and continuous change of the real world software applications have provoked researchers to propose several computing services'techniques to achieve more efficient and effective management of web telemedicine database systems (WTDS). Significant research progress has been made in the past few years to improve WTDS performance. In particular, databases as a critical component of these systems have attracted many researchers. The web plays an important role in enabling healthcare services like telemedicine to serve inaccessible areas where there are few medical resources. WTDS enable high quality continuous delivery of patient's information wherever and whenever needed. Several benefits can be achieved by using web telemedicine services including: medical consultation delivery, transportation cost savings, data storage savings. Recently, many researchers have focused on designing web medical database management systems that satisfy certain performance levels. Such performance is evaluated by measuring the amount of relevant and irrelevant data accessed and the amount of transferred medical data during transactions' processing time.

Several techniques have been proposed in order to improve telemedicine database performance, optimize medical data distribution, and control medical data proliferation. These

techniques believed that high performance for such systems can be achieved by improving at least one of the database web management services, namely database fragmentation, data distribution, websites clustering, distributed caching, and database scalability.

However, the intractable time complexity of processing large number of medical transactions and managing huge number of communications make the design of such methods a non-trivial task. Designing and developing fast, efficient, and reliable incorporated techniques that can handle huge number of medical transactions on large number of web healthcare sites in near optimal polynomial time are key challenges in the area of WTDS. Data fragmentation, websites clustering, and data allocation are the main components of the WTDS that continue to create great research challenges. To improve the performance of medical distributed data base systems, we incorporate data fragmentation, websites clustering, and data distribution computing services together in a new web telemedicine database system approach.

This new approach intends to decrease data communication, Increase system throughput, reliability, and data availability.

1.1 RELATED WORK:

. Recently, many researchers have focused on designing web medical database management systems that satisfy certain performance levels. Such performance is evaluated by measuring the amount of relevant and irrelevant data accessed and the amount of transferred medical data during transactions'processing time.

Several techniques have been proposed in order to improve telemedicine database performance, optimize medical data distribution, and control medical data proliferation. These techniques believed that high performance for such systems can be achieved by improving at least one of the database web management services, namely database fragmentation, data distribution, websites clustering, distributed caching, and database scalability.

1] Some of these data records may be overlapped or even redundant, which increase the I/O transactions'processing time and so the system communications overhead.

2] These works have mostly investigated fragmentation, allocation and sometimes clustering problems.

3] The transactions should be executed very fast in a flexible load balancing database environment. When the number of sites in a web database system increases to a large scale.

4] The intractable time complexity of processing large number of medical transactions and managing huge number of communications make the design of such methods a non-trivial task.

2. Proposed functioning:

This approach integrates three enhanced computing services' techniques namely, database fragmentation, network sites clustering and fragments allocation It's proposed an estimation model to compute communications cost which helps in finding cost-effective data allocation solutions. We perform both external and internal evaluation of our integrated approach.

1]In this proposed system we Develop a fragmentation computing service technique by splitting telemedicine database relations into small disjoint fragments. This technique generates the minimum number of disjoint fragments that would be allocated to the web servers in the data distribution phase. This in turn reduces the data transferred and accessed through different websites and accordingly reduces the communications cost.

2]In the proposed system introduce a high speed clustering service technique that groups the web telemedicine database sites into sets of clusters according to their communications cost. This helps in grouping the websites that are more suitable to be in one cluster to minimize data allocation operations,

which in turn helps to avoid allocating redundant data.

3]It‘s propose a new computing service technique for telemedicine data allocation and redistribution services based on transactions‘ processing cost functions.

4] Develop a user-friendly experimental tool to perform services of telemedicine data fragmentation, websites clustering, and fragments allocation, as well as assist database administrators in measuring WTDS performance.

5] Integrate telemedicine database fragmentation, websites clustering, and data fragments allocation into one scenario to accomplish ultimate web telemedicine system throughput in terms of concurrency, reliability, and data availability.

6] I t‘s integrated approach significantly improves services requirement satisfaction in web systems. This conclusion requires more investigation and experiments

7] This technique generates the minimum number of disjoint fragments that would be allocated to the web servers in the data distribution phase.

8] Introduce a high speed clustering service technique that groups the web telemedicine database sites into sets of clusters according to their communications cost.

2.1 System Architecture:

The data request is initiated from the telemedicine database system sites. The requested data is defined as SQL queries that are executed on the database relations to generate data set records. Some of these data records may be overlapped or even redundant, which increase the I/O transactions‘processing time and so the system communications overhead. To solve this problem, we execute the proposed fragmentation technique which generates telemedicine disjoint fragments that represent the minimum number of data records. The web telemedicine database sites are grouped into clusters by using our clustering service technique in a phase prior to data allocation. The purpose of this clustering is to reduce the communications cost needed for data allocation.

Accordingly, the proposed allocation service technique is applied to allocate the generated disjoint fragments at the clusters that show positive benefit allocation. Then the fragments are allocated to the sites within the selected clusters. Database administrator is responsible for recovering any site failure in the WTDS

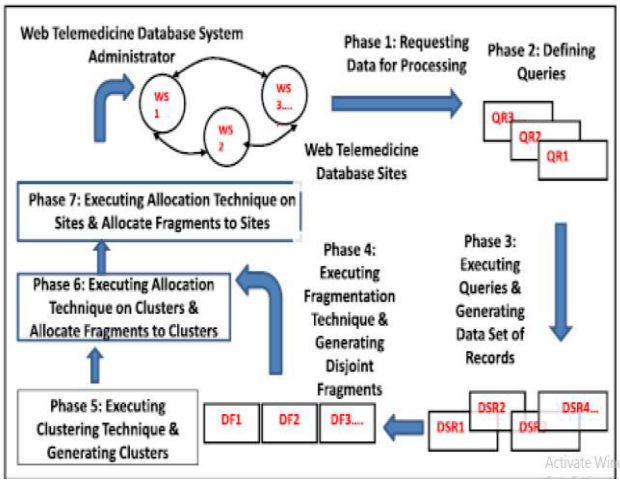

Fig: System Architectures

1. Web Architecture and Communications System Model:

In the first module, the telemedicine approach is designed to support web database provider with computing services that can be implemented over multiple servers, where the data storage, communication and processing transactions are fully controlled, costs of communication are symmetric, and the patients‘information privacy and security are met. It‘s propose fully connected sites on a web telemedicine heterogeneous network sy512 kbps, or multiples. In this environment, some servers are used to execute the telemedicine queries triggered from different web database sites. Few servers are run the database programs and perform the fragmentation clustering- allocation computing services while the other servers are used to store the database fragments. Communications cost (ms/byte) is the cost of loading and processing data fragments between any two sites in WTDS. To control and simplify the proposed web telemedicine communication system, we assume that

communication costs between sites are symmetric and proportional to the distance between them. Communication costs within the same site are neglected.

2. Fragmentation and Clustering:

Telemedicine queries are triggered from web servers as transactions to determine the specific information that should be extracted from the database. Transactions include but not limited to: read, write, update, and delete. To control the process of database fragmentation and to achieve data consistency in the telemedicine database system, IFCA fragmentation service technique partitions each database relation according to the Inclusion-Integration-Disjoint assumptions where the generated fragments must contain all records in the database relations, the original relation should be able to be formed from its fragments, and the fragments should be neither repeated nor intersected.

The logical clustering decision is defined as a Logical value that specifies whether a website is included or excluded from a certain cluster, based on the communications cost range. The communications cost range is defined as a value (ms/byte) that specifies how much time is allowed for the websites to transmit or receive their data to be considered in the same cluster, this value is determined by the telemedicine database administrator.

3. Fragments Allocation:

The allocation decision value ADV is defined as a logical value (1, 0) that determines the fragment allocation status for a specific cluster. The fragments that achieve allocation decision value of (1) are considered for allocation and replication process. The advantage that can be generated from this assumption is that, more communications costs are saved due to the fact that the fragments'locations are in the same place where it is processed, hence improve the WTDS performance.

On the other hand, the fragments that carry out allocation decision value of (0) are considered for allocation process only in order to ensure data availability and fault-tolerant in the WTDS.In this case, each fragment should be allocated to at least one cluster and one site in this cluster. The allocation decision value ADV is assumed to be computed as the result of the comparison between the cost of allocating the fragment to the cluster and the cost of not allocating the fragment to the same cluster.

The allocation cost function is composed of the following sub-cost functions that are required to perform the fragment transactions locally: cost of local retrieval, cost of local update to maintain consistency among all the fragments distributed over the websites, and cost of storage, or cost of remote update and remote communications (for remote clusters that do not have the fragment and still need to perform the required transactions on that fragment). The not allocation cost function consists of the following sub-cost functions: cost of local retrieval and cost of remote retrievals required to perform the fragment transactions remotely when the fragment is not allocated to the cluster.

4. Data Allocation and Replication:

Data allocation techniques aim at distributing the database fragments on the web database clusters and their respective sites. We introduce a heuristic fragment allocation and replication computing service to perform the processes of fragments allocation in the WTDS. Initially, all fragments are subject for allocation to all clusters that need these fragments at their sites. If the fragment shows positive allocation decision value (i.e., allocation benefit greater than zero) for a specific cluster, then the fragment is allocated to this cluster and tested for allocation at each of its sites, otherwise the fragment is not allocated to this cluster. This fragment is subsequently tested for replication in each cluster of the WTDS. Accordingly, the fragment that shows positive allocation decision value for any WTDS cluster will be allocated at that cluster and then tested for allocation at its sites. Consequently, if the fragment shows positive allocation decision value at any site of cluster that already shows positive allocation decision value, then the fragment is allocated to that site, otherwise, the fragment is not allocated. This process is repeated for all sites in each cluster that shows positive allocation decision value.

3. CONCLUSIONS

In this work, we proposed a new approach to promote WTDS performance. My approach integrates three enhanced computing services 'techniques namely, database fragmentation, network sites clustering and fragments allocation. It's develop these techniques to solve technical challenges, like distributing data fragments among multiple web servers, handling failures, and making tradeoff between data availability and consistency. These propose an estimation model to compute communications cost which helps in finding cost-effective data allocation solutions. The novelty of our approach lies in the integration of web database sites clustering as a new component of the process of WTDS design in order to improve performance and satisfy a certain level of quality in web services.

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