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Implementing Web-Based Computing Services To Improve Performance And Assist Telemedicine Database Management System

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Abstract : *This paper will focus on database management system with application scenarios in real time telemedicine database management systems to maximize care admissions and minimize care difficulties issue such as distance, travel, and time complexity. This paper implements three-fold approach on the basis of database fragmentation, database websites clustering and intelligent data distribution (allocation). This approach reduces the amount of data transmission between many websites during applications execution to achieve cost efficient Communication between websites during applications processing and improves applications response time, reliability, flexibility and throughput. The implemented system will validate internally by checking the impact of using this computing services' technology on different performance characteristics such as communications cost, response time, and throughput . The results show that this combined approach specifically improves the performance of web database systems and outperforms its correlated work.*

Keywords*:-Web-telemedicine Database System(wtds), Database Fragmentation, Data Distribution, Sites Clustering.*

I. INTRODUCTION

Now a days the real world software applications have increasing rapidly and changes continuously, it inspired researchers to propose different computing techniques to achieve more efficient and effective management of web telemedicine database systems (WTDS). Valuable progress has been made in the past few years to improve WTDS activities. The web is an important factor in making available health-care services like telemedicine to serve inaccessible areas where there are less medical resources. It provides an easy and global access to patient's data without having to interact with the patient personally and it provide fast channels to consult specialists in emergency situations. Different types of patient's information such as ECG, temperature, and heart rate need to be accessed by means of various client devices in heterogeneous communications environments. web telemedicine database systems (WTDS) enable high quality continuous delivery of patient's information at any place and whenever required. Data fragmentation, websites clustering, and data allocation are the main attributes of the WTDS that continue to create great research challenges as their current best near optimal solutions are all NP-Complete. To improve the performance of medical distributed DB management a system, this system includes techniques data fragmentation, websites clustering, and data distribution computing services together in a new web telemedicine database system approach. This new approach intends to reduce data communication, increase system throughput, reliability, and data availability.

Now a days many researchers have focused on designing web medical database management systems that satisfy various performance levels. Such performance is calculated by measuring the amount of relevant and irrelevant data accessed and the amount of transferred medical data during transactions processing time. Different methods have been developed in order to improve telemedicine database performance, optimize medical data distribution, and control medical data proliferation. These methods believed that high performance for such systems can be achieved by improving at least one of the database web management services, like—database fragmentation, data distribution, websites clustering, distributed caching, and database scalability. However, the intractable time complexity of processing huge number of medical transactions and managing large number of communications make the design of such methods a non-trivial task. Moreover, none of the existing methods consider the three techniques together which makes them impracticable in the field of web database systems. Additionally, using various medical services from different web database providers may not fulfill the needs for improving the telemedicine database system performance. Furthermore, the services from different web database providers may not be compatible or in some cases it may increase the transaction time because of the constraints on the network. Lastly, there has been lack in the tools that support the design, analysis and cost-efficient deployments of web telemedicine database systems.

Objective of this system are several benefits can be achieved by using web telemedicine services including: transportation cost savings, medical consultation delivery, data storage savings, and mobile applications support that overcome obstacles related to the performance like bandwidth, battery life, and storage, security like privacy, and reliability, and environment like scalability, heterogeneity, and availability. The objectives of such services are to: (i) Develop huge applications that scale as the scope and workload increases, (ii) Achieve precise control and monitoring on medical data to develop high telemedicine database system performance, (iii) Provide large data archive of medical data records, accurate decision support systems, and trusted event-based notifications in typical clinical centers.

In this system, we noticed the previous disadvantages and propose a three-principle approach that manages the computing web services that are required to promote telemedicine database system performance. The main contributions are: 1). Develop a fragmentation computing service method by distributing telemedicine database relations into small disjoint fragments. This method generates the minimum number of disjoint fragments that would be allocated to the web servers in the data distribution phase. This in turn minimizes the data transferred and accessed through different websites and accordingly reduces the communications cost. 2). Introduce a high speed clustering service method 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 capable to be in one cluster to reduce data allocation operations, which in turn helps to avoid allocating redundant data. 3). Propose a new computing service technique for telemedicine data allocation and redistribution services based on transactions processing cost functions. These functions guarantee the lowest communications cost among websites and hence accomplish better data distribution compared to allocating data to all websites evenly. 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 calculating WTDS performance. 5). Combine 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. We call this scenario Integrated-Fragmentation-Clustering-Allocation (IFCA) approach.

II. Related Work Done

Most of the research works have attended to improve the performance of distributed database management systems. these work have mostly investigated fragmentation, data allocation and many times website clustering problem. In this section we show the solutions related to these problems, discuss and compare their contribution with our proposed system.

Data fragmentation:

Considering Fragmentation, the amount of data distribution is an important issue. It has become important to divide the relation into smaller data fragments and distribute it over the networking sites. The authors in have considered each record as separate relation and allocated a disjoint fragment to it causing high communication cost for transmission and processing of fragments. Another author in have considered whole relation as a fragment but this research concludes in data redundancy and fragment overlapping.

Website clustering:

Clustering websites service identifies groups of networking websites and enables distributions Among large web database systems. This technology is considered as an effective method that has a vital role in minimising processing of data during its transformation and access process. Mostly, grouping distributed network websites into clusters helps to reduce the communication-costs between the websites .In a distributed system environment number of websites has increased and amount of its data has increased tremendously, having transparency issue. For reliable database system environment, the transaction should be carried out very fast maintaining load balancing in database. However, clustering of networking websites is still a crucial issue and the optimistic solution to this issue is NP-Complete . But, in this complex networking, large numbers of sites are inter-connected with each other and a large number of transaction are required, but it increases the system load management and decreases its performance. The authors in have proposed a technique called hierarchical clustering which states similar upper approximation derived from a tolerance(similarity) relation and based on rough set theory that does not require any prior information about the data. The technique concludes, rough clusters in which an objects are used of more than one cluster. Clustering values are required in many techniques for quantify the structural networking.

Data Allocation (Distribution):

Data allocation is the technique for allocating fragments to the websites clusters. this approach addresses the assignment of networking nodes to each of the fragment .But, to find a perfect data allocation is NP-complete problem . The efficiency of data allocation technique is measured in term of responsive time. Author of have proposed dynamic approach to data Fragmentation and data allocation technique. Aim of this method is to reduce the communication-cost for data access, re-fragmentations of data and reallocations management. DYFRAM technique in this approach determines access to every replica and results in defragmentation and re-allocation on the basis of recent history. This algorithm executes after a interval, individually for each replicates. But data consistency, data availability ,system reliability and concurrency control are not considered in DYFRAM approach.

The authors of proposed a system for modelling distributed data fragmentation by using UML 2.0. This technique works on a probability distribution in which execution is estimated beforehand. However, the most likely time is not determining for distinguishing the priorities between transactions. Additionally, many designed parameters need to be estimated before and entered by designers where different results may be generated for the same application case.

III. Proposed System

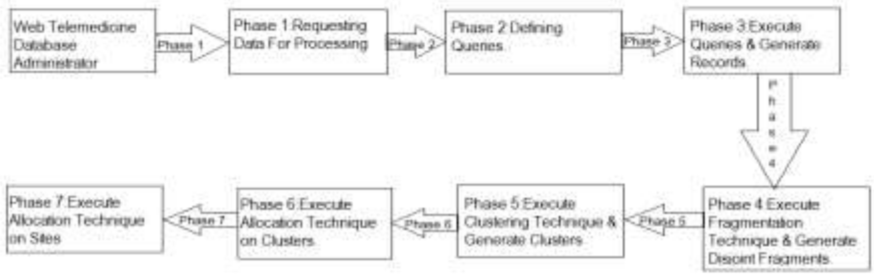

Fig 1 . IFCA system architecture

The Telemedicine IFCA architecture has six phases. In phase one Generally the data request is started from the telemedicine database system sites. In phase two queries are defined for all the requested data which will be executed on database relation to generate data sets in phase three. Phase 4 executes fragmentation technique which in-turn produces disjoint fragments. Phase 5 executes clustering technique and generates number of clusters. Phase 6 and phase 7 will execute allocation and distribution technique on clusters and sites respectively.

Telemedicine IFCA Services

3.1 Data Fragmentation services-

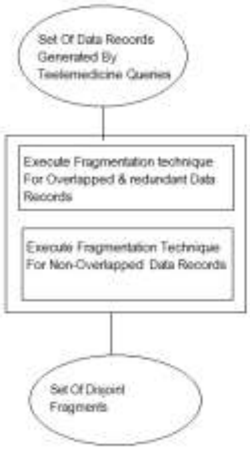

Fig.2:Data fragmentation services architecture.

In data Fragmentation computing services each database relations are partitioned in data sets which ensures data inclusions, data integration and non-overlapping of data. The fragmentation computing services basically has two internal processes: (1) Process for Overlapped and redundant data records and (2) Process for non-overlapped data records.

ALGORITHM FOR DATA FRAGMENTATION.

Step 1:Take two random variables a,b and initialize it with 1.
Step 2:do steps(3-) until a>F.size() and j>f.size().
Step 3:if a is not equal to b and Fa or Fb belongs to f then goto step 4.
Step 4: Add common elements or data of Fa and Fb into one fragment Fk.
Step5: Create new fragment Fk+1=Fa-Fk add it to F.
Step 6:Create another fragment Fk+2=Fb-Fk add it to F.
Step 7:delete Fa and Fb.
Step 8.Stop.

3.2 Site Clustering Service:

#Site	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7
Site 1	0	6	11	10	7	8	9
Site 2	6	0	10	10	2	3	2
Site 3	11	10	0	6	3	2	5
Site 4	9	2	7	0	7	2	3
Site 5	5	7	1	8	0	5	2
Site 6	4	1	2	5	4	0	2
Site 7	2	4	2	1	1	3	0

Fig 3..site clustering service architecture

Clustering of web telemedicine database sites speeds up the process of data allocation by distributing the fragments at the clusters that accomplish benefit allocation rather than distributing the fragments once at all websites.

Thus, the communication costs are minimized and the WTDS performance is improved. In this work, we introduce a high speed clustering service based on the least average communication cost between sites. The parameters used to control the input/output computations for generating clusters and determining the set of sites in each are computed as follows:

_ Communications cost between sites CC(Si, Sj) ¼ data creation cost þ data transmission cost between Si, Sj.
_ Communication cost range CCR (ms/byte) which is determined by the telemedicine database system administrator.
_ Clustering Decision Value (cdv): cdvðSi; SjÞ ¼f1 : IF CCðSi; SjÞ _ CCR ^ i 6¼ j and
0 : IF CCðSi; SjÞ > CCR _ i ¼ j.

ALGORITHM FOR WEBSITE CLUSTERING TECHNIQUE.

Input: Communication Cost Matrix CC(Si,Sj), Communication Cost Range CCR, List of WTDS sites N.
Output: Clustering Decision Value CDV(Sn,Sn).
Step 1: for i=1,N.size(),do steps (2-8).
Step 2: for j=1, N.size(), do steps (3-7).
Step 3: if i is not equal to j and CC(Si,Sj)<=CCR, go to step 4 else go to step 5
Step 4:Set 1 to both CDV(Si,Sj) and CDV(Sj,Si) go to step 6.
Step 5: Set 0 to both CDV(Si,Sj) and CDV(Sj,Si)
Step 6: End if.
Step 7: End for.
Step 8: End for.
Step 9: Stop.

3.3 Data Distribution:

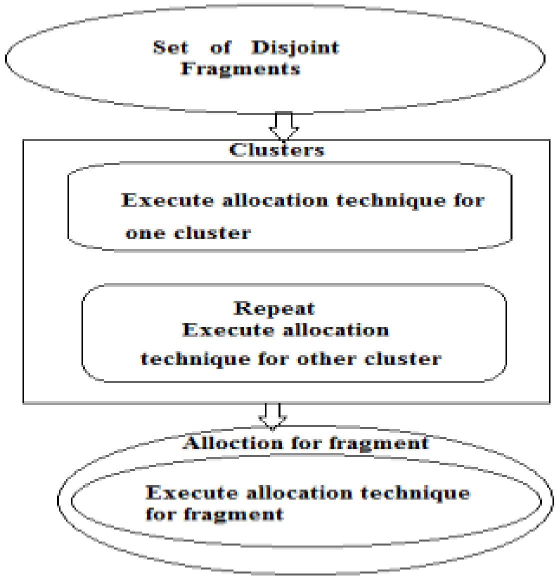

Fig.4 Data allocation and distribution.

In data allocation and distribution fragments are allocated to all the clusters. In this method algorithms and rules are essential used to notice that exactly one and only one copy of fragment across all the sites. The allocation of fragments is done on the basis of Allocation Decision Value (ADV). If the allocation decision value is positive then the fragment is allocated and if the allocation decision value is negative then the fragment is not allocated.

IV. Conclusion

This work introduced three fold approach. This paper combines three approaches likely data fragmentation, web-site clustering and data allocation. The main aim of the system is to accomplish the system throughput in terms of reliability, availability, and data consistency. the system improves the communication and reduces communication cost.

References

[1] Clustering Large: Scale,Distributed Software Component Repositories(2012) presented by M.P.Paixao,L.Silva.
[2] Dynamics Fragmentation And Replica Management in Distributed Database System(2012) presentedby J.Hauglid,N.Ryeng
[3] A New Technique For Database Fragmentation In Distributed System(2011) presented by H.Khan
[4] Modeling Of Mixed Fragmentation In Distributed Database Using UML2.0 Presented By T.Kumar And M.Mrunalini.