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Elastic Routing Table (ERT) Mechanism For Query Load Balancing In Consistent Hashing-Based DHT Networks

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Abstract - **Consistent hashing-based DHT networks have an inherent load balancing problem. The problem becomes more severe in heterogeneous networks with non-uniform and time-varying popular files. Existing DHT load balancing algorithms are mainly focused on the issues caused by node heterogeneity. To deal with skewed lookups, this paper presents an elastic routing table (ERT) mechanism for query load balancing, based on the observation that high-degree nodes tend to receive more traffic load. The in-degree and out-degree of the routing table can also be adjusted dynamically in response to the change of file popularity and network churn. Theoretical analysis proves that the routing table degree is bounded. The ERT mechanism facilitates locality-aware randomized query forwarding to further improve lookup efficiency. By relating query forwarding to a supermarket customer service model, we prove that a two-way randomized query forwarding policy should lead to an exponential improvement in query processing time over random walking. Simulation results demonstrate the effectiveness of the ERT mechanism and its related query forwarding policy for congestion and query load balancing. In comparison with existing "virtual-server"-based load balancing algorithms and other routing table control approaches, the ERT-based congestion control protocol yields significant improvement in query lookup efficiency. DHT routing algorithms may lead to the convergence of query load targeted for an object on a small number of nodes around the destination, leading to bottlenecks.**

Index Terms - **Elastic Routing Table, Heterogeneous Networks, Virtual Server, Load Balancing Algorithm.**

I. INTRODUCTION

Task scheduling, one of the most famous combinatorial optimization problems, plays a key role to improve flexible and reliable systems. The main purpose is to schedule tasks to the adaptable resources in accordance with adaptable time, which involves finding out a proper sequence in which tasks can be executed under transaction logic constraints. There have been a lot of algorithms put forward for task scheduling in many different research fields, whereas few covers the arisen field cloud computing.

Cloud computing, which means assigning computation on a dynamic resource pool composed of massive computers, makes users gain computation capability, memory space and software services online according to different requirements. In cloud computing, resources (including CPUs) are of computational and communication heterogeneity and are always dynamically collocated. This leads task scheduling in cloud computing to be a dynamic scheduling problem. There are mainly two factors of uncertainties.

1. Task flow is uncertain. Instances of task flow are uncertain; the execution path and times of the flow are also uncertain.
2. Resources are uncertain. During the possible long time of execution, available resources with their quantity and form are changing all the way; resources' capability, current load, interests and tasks' requests, which can effect the scheduling a lot, are dynamic too.

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Genetic algorithm, based on natural selection and inheritance theory, has been widely and successfully applied in scheduling problems.

II. SYSTEM STUDY

EXISTING SYSTEM:

Task scheduling algorithm, which is an NP-completeness problem, plays a key role in cloud computing systems. An optimized algorithm based on genetic algorithm to schedule independent and divisible tasks adapting to different computation and memory requirements. Though GA is designed to solve combinatorial optimization problem.

THE PROPOSED SYSTEM:

Genetic algorithm, based on natural selection and inheritance theory, has been widely and successfully applied in scheduling problems. An application of GA in task scheduling in order to adapt to the memory constraints and high request of performance in cloud computing.

III. MODULE DESCRIPTIONS

File Sharing:

This module is, the users can enter into this module and can view the file name which the administrator stored into the servers. The user can select the file from the list and can download from the server which is in idle state. We will get the response time and from which server we are getting the file. Finally we can get the decrypted file from the key pair.

Authentication Module:

This module is to register the new users and previously registered users can enter into our project. The admin only can enter and do the uploading files into the servers.

IP Address and Client Request:

The IP Address Representation module is to give the IP addresses which we are going to assign those as servers. We can enter and view IP addresses from this module. In load balancing system we can connect the three servers [system]. The connection has to be represented by the IP Address representation only.

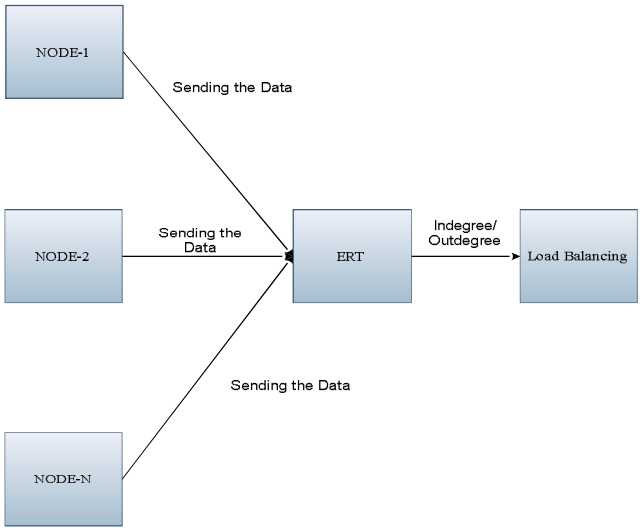
Task Scheduling:

The Load Servers module has the authentication for the administrator only can enter into this module. The administrator will do the encryption of the text file and store into the servers which we are assigned in IP representation module. This module will make the both public and private key for the cryptography

Download:

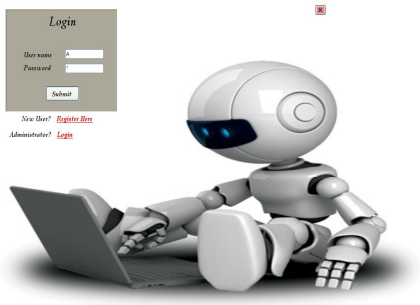
We will get the response time and from which server we are getting the file. From the response time produce the chart report here. It compares the response time between the servers and downloads the given file in the better performance response time server.

IV. SYSTEM ARCHITECTURE



V. OUTPUT SCREENS

Login Form



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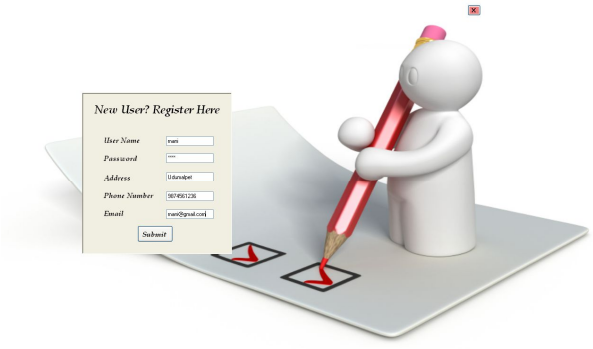
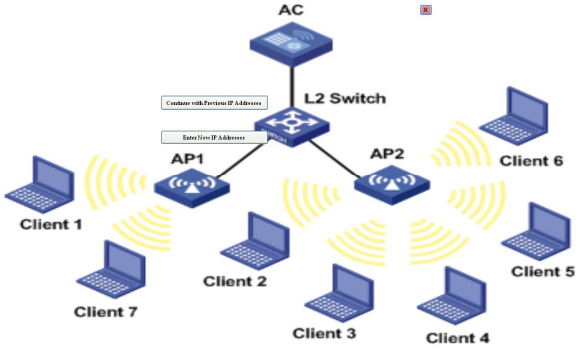
New User Registartion

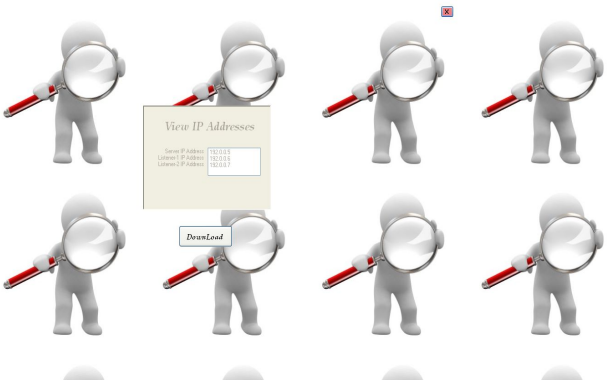


IP Address Manage Form

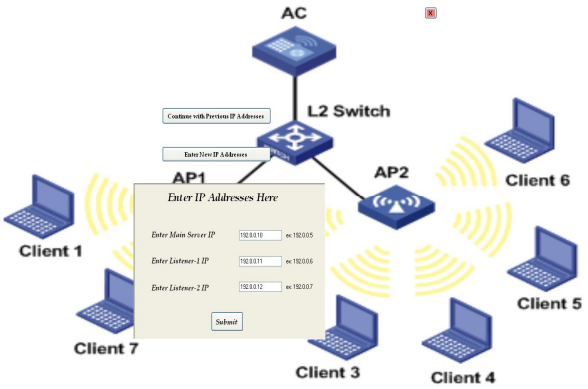


File Download

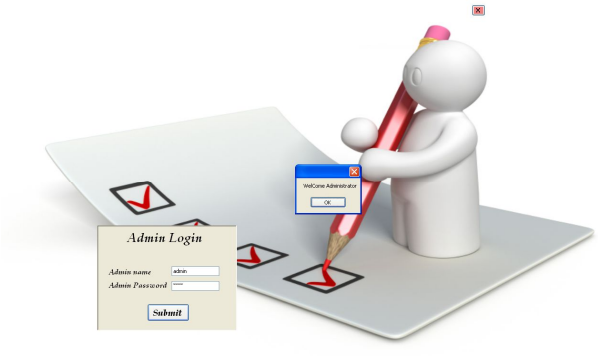
New IP Address Form

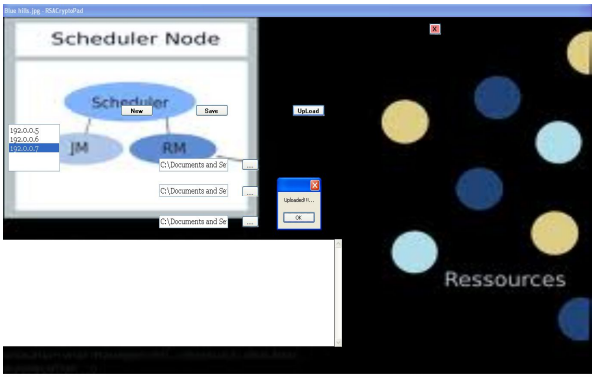


Admin Login



File Upload Form





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IV. CONCLUSION

DHT networks have an inherent congestion problem caused by query load due to the nature of heterogeneity and dynamism of nodes. Nonuniform and time-varying file popularity makes the problem more severe. This paper presents a ERT-based congestion control protocol for DHT networks, which consists of three components: indegree assignment, periodic indegree adaptation, and topology aware query forwarding. Theoretical analysis establishes the bounds of the indegree and outdegree, and proves the performance of the protocol in general in terms of both query load balance factor and query processing time. Simulation results show the superiority of the congestion control protocol compared with other methods in static network, skewed lookups, and in churn, and show the effectiveness of each algorithm in the protocol. It makes full use of each node's capacity while control each node's load below its capacity. It improves the lookup efficiency in DHT network by reducing lookup latency.

REFERENCES

[1] Steve Harris and Robmac Donald, "Web Development with VB.NET" -A press.

[2] Matthew Macdonald, "Microsoft Visual Basic.NET Programmer's Cookbook" -Tata Mcgraw Hill Edition

[3] Chris Goode, John Kauffman, "Beginning ASP.NET 1.0 with Visual Basic.NET" -Wrox Programmer to Programme.

[4] Douglas O.Reilly, "Designing Microsoft ASP.NET Applications -Tata Mcgraw Hill Edition.