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CONTENTS

Sr. No.	TITLE & NAME OF THE AUTHOR (S)	Page No.
1.	ROLE OF TRAINING FOR MAINTAINING AN ISO 9001 SYSTEM <i>DR. VINOD N. SAYANKAR</i>	1
2.	AN ANALYSIS OF THE ROLE OF SMALL SCALES INDUSTRIES' SECTOR IN INDIA <i>SONIKA CHOUDHARY & DR. M. L. GUPTA</i>	4
3.	REDUCING PATH CONGESTION AND FAILURE IN AN INTERACTIVE NETWORK APPLICATIONS <i>S. SATHYAPRIYA, A. KUMARESAN & K. VIJAYAKUMAR</i>	7
4.	SEGMENTING THE SHOPPERS OF GREEN FASHION PRODUCTS ON THEIR SHOPPING BEHAVIOUR <i>DR. MANOJ KUMAR</i>	11
5.	SEARCHING THE CAUSES OF ORGANIZATIONAL FAILURE IN CONTROLLING DRUG ADDICTION IN THE PERSPECTIVE OF SOME RELEVANT VARIABLES IN BANGLADESH WITH SPECIAL REFERENCE TO SYLHET <i>ABDUL LATIF & SARUAR AHMED</i>	14
6.	AN ASSESSMENT OF QUALITY OF SERVICE DELIVERY IN ETHIOPIAN PUBLIC HIGHER EDUCATION INSTITUTIONS <i>DR. SOLOMON LEMMA LODESSO</i>	20
7.	A STUDY OF THE EFFECTS OF INSUFFICIENT SLEEP, CHANGES IN THE SLEEPING AND FOOD HABITS OF NIGHT SHIFT WORKERS <i>CHHAYA P. PATEL</i>	26
8.	ELECTRONIC COMMERCE ADOPTION BY MICRO, SMALL AND MEDIUM SIZED ENTERPRISES <i>BISWAJIT SAHA</i>	47
9.	THE WORKING CAPITAL ANALYSIS OF DISTRICT CENTRAL COOPERATIVE BANKS IN TIRUNELVELI REGION, TAMILNADU <i>DR. A. MAHENDRAN & R. AMBIKA</i>	50
10.	QUANTIFICATION OF QUALITY AS PER USER PERSPECTIVE IN SOFTWARE DEVELOPMENT <i>SHABINA GHAFIR & MAMTA SHARMA</i>	58
11.	A STUDY ON CORPORATE SOCIAL RESPONSIBILITY <i>M. UMREZ, B. SWATHI & K. LAVANYA</i>	65
12.	COMPUTERIZED ACCOUNTING INFORMATION SYSTEMS AND SYSTEM RISK MANAGEMENT IN NIGERIAN BANKS <i>DR. DAFERIGHE, EMMANUEL EMEAKPONUZO & DR. UDIH, MONEY</i>	67
13.	EVALUATION OF CUSTOMER SATISFACTION ON BROADBAND INTERNET SERVICE USERS OF ETHIO TELECOM <i>ADEM MOHAMMED HABIB & YIBELTAL NIGUSSIE AYELE</i>	73
14.	EXPERIMENTATION IN OSPF MULTIPATH ENVIRONMENT WITH OPTIMAL INTERFACE TIMERS <i>KULDEEP DESHMUKH</i>	80
15.	FINANCIAL INDICATORS FOR BUY BACK OF SHARES <i>PRERNA SEHGAL & DIMPY HANDA</i>	86
	REQUEST FOR FEEDBACK & DISCLAIMER	90

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REDUCING PATH CONGESTION AND FAILURE IN AN INTERACTIVE NETWORK APPLICATIONS**S. SATHYAPRIYA****STUDENT****DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING****S. K. P. ENGINEERING COLLEGE****TIRUVANNAMALAI****A. KUMARESAN****PROFESSOR****DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING****S. K. P. ENGINEERING COLLEGE****TIRUVANNAMALAI****K. VIJAYAKUMAR****PROFESSOR****DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING****S. K. P. ENGINEERING COLLEGE****TIRUVANNAMALAI****ABSTRACT**

Real time interactive applications are utilized in huge network applications such as online trading, online gaming. At present the emerging application is computer gaming. Due to more request from the client side there occurs a traffic which leads to lag or latency. To achieve a equalized delay here an approach called Latency Equalisation Service (LEQ) With network support, the network delay measurement can be performed more accurately throughout the network either at the client or server side with network support. Few routers in the network were picked as hubs to transmit packets. Frequent accessibility can leads to the problem so carried an approach called Htrae where the routers is used for the transmission with a wireless protocol to transmit the information and to reduce the delay. In the Existing system greedy algorithm is used where hub selection remains NP-hard. If it remains as NP-hard, the condition is inapproximable. In proposed approach the delay difference is reduced up to a millisecond.

KEYWORDS

LatencyEqualization (LEQ) Algorithm, router as hubs, Htrae.

INTRODUCTION

In the multiple interactive network applications involve several users taking part during a interactive applications. Increasing popularity and accessibility of internet ends up in traffic during a new generation of frequent net users. The quickest growing segments of the computer market are that of on-line gaming. Contributory to the present growth is especially attributable to the widespread support of networking in PCs. for instance, on-line gaming and e-Commerce, on-line commercialism. The delay distinction minimizing among participants can lead additional period interactivity. In this paper on-line gaming is used as an example that is enforced either at the client or server side with network support. With network support, the network delay measurement can be performed correctly. While using the network there will be some latency occurring in interactive network application. The problem of accessing the internet is particularly latency or lag and the lag is due to packets tending to experience relatively large delays in traversing these networks. Generally latency is the time delay or a short period of delay experienced in the system

In [2]-[4], The author mentioned the delay and also the delay difference practiced by the frequent internet users considerably affects the game quality. to boost the interactive expertise, game servers had enforced by taking part players will vote to exclude players with higher lag times. additionally in [5] particularly in e-commerce, latency variations between pairs of looking agents and evaluation agents may result in unfair advantage to those pairs of agents have lower latency. antecededently they consider application-based solutions to realize equalised delay. Client side solutions are exhausting as a result they require that all clients swap latency information to all other clients. There happens divergence within the network applications need delimited delay difference across multiple clients to avoid traffic. A server-side technique places memory overhead on the applying servers. To scale back delay with network support they show the necessity to scale back delay since the prime supply of the latency distinction is from the network. within the paper [14] utilizing the idea of programmable router. A key element of flexibility is that the programmable router. Here the beginners of 2 totally different routing architectures: one meets the low latency wants of standard applications and also the different meets latency effort (LEQ) needs among a group of interacting users. Overhead of network measurements and also the implementation of latency compensation techniques consume central time on servers and important processing power. we have a tendency to carried an approach of planning and implementing network-based Latency effort. web Service suppliers provides additional careful information of current network traffic and clump among themselves. Therefore, internet Service suppliers will higher support latency effort routing for an oversized variety of players with varied delays. Without network support it is difficult for applications run proper in unusual conditions and failures. Latency Equalisation is done using adjacent nodes and routers. The routing is done by moving information from source to destination Latency compensation techniques are supported on hardware and software improvement in the quality is to speed up the processing. The techniques cannot equalize a group of servers for delay variations.

ARCHITECTURE DESIGN OF LATENCY EQUALIZATION

The basic LEQ architecture is to support access network delay. This section deals with A. Basic LEQ Hub Routing, B. LatencyEqualisation Routing design, C. Comparing alternative Network Based Solutions, D. In the Presence of Access Network Delay.

A. Basic LEQ Hub Routing

First, The LEQ routing is completed employing a hub routing: The hubs within the network are accustomed with the packets the delays is equal for interactive applications. The internet service supplier will enable the projected LEQ routing design to take a note on several applications on a similar network. the fundamental LEQ design focuses on equalizing traffic or congestion delays between the client and also the server edge routers while not considering access delay. currently supported the Latency service the applying traffic from every edge router is assigned to a collection of hubs. These edge routers with the applying packets equivalent to the LEQ service through the hubs to the servers. Redirecting packets through the hubs from totally different client edge routers with different delays to the servers can reach the servers at intervals a assumed delay difference. In different cases or additionally we are able to assume this

type of effort design it depends. for instance, in Figure.1 from the paper [15] the client congestion from a network application enters the supplier network through edge routers R1 and R2. The server is connected to the network through edge routers. R6 and R7 are chosen as hubs for R1. R7 and R8 are chosen as hubs for R2. Using R1, has 2 methods to the server edge router R10: R1-R6- R10 and R1-R7-R10 each of that have a delay of ten milliseconds. R2 additionally has 2 paths: R2-R7-R10 and R2-R8-R10, whose delay is additionally ten milliseconds. Latency service is achieved by optimized hub choice.

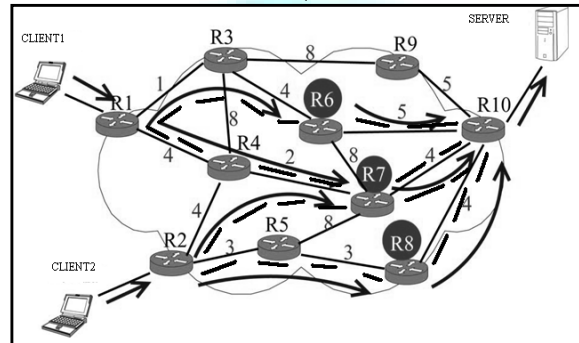
Every client edge router is assigned to over one hub, thus it will simply choose the hubs to avoid congestion. In Figure.1, LEQ architecture (R6, R7, R8 Routers used as Hubs) R1 and R2 are each used 2 hubs. Our LEQ design involves 3 key parts. The hub selection algorithm is chosen because an online hub selection algorithm would require significant monitoring overhead and fast online path calculation and network failures and network congestion.

B. Latency Equalisation Routing design

The algorithm assumes the presence of clients at all edge routers. The inputs are the edge router locations, network topology, and the approximated delay. A group of routers is selected to serve as hubs for each client edge router and sends this information of the assigned hubs to the client edge routers.

Packets are sent through the hubs while not changes to routing design. considering all edge routers as the chosen hub nodes which will be shared among several network applications. analyzing additionally shows that the LEQ design with some hubs scales well with increase within the number of servers. Implementing the higher than LEQ routing design, implementation on totally different delay and delay difference meet the necessities of various forms of interactive network applications. to boost the latency effort performance for the application the edge router initially identifies interactive application packets by their port number and known to the service provider in advance and then redirects the packets by its assigned hubs. once the traffic is found on a path, the sting router will sent packets to a different assigned hub to induce round the purpose of congestion.

FIGURE 1: LEQ ROUTING DESIGN (R6, R7, R8 Routers used as Hubs)



C. Comparing Alternative Network-Based Solutions

Comparison between Latency Equalisation design to different network-based solutions is done in paper [7]. To implement latency effort the LEQ design is scalable to several servers and applications with modifications to the edge routers. The approach of implementing the network is to equalize delays to buffer packets at the edge routers. this needs huge buffers for every interactive application, creating the router expensive and power inefficient. Edge routers want advanced packet-scheduling mechanisms that takes packet delay needs, with different edge routers to determine however long to buffer these packets. Our LEQ design will scale back the delay with and while not compromising delay. Also one could use source routing to address the problem of latency equalization. Source routing is chosen by the sender and the packets are sent the server. All clients are known about the network topology and coordinate with each other to ensure that the delay differences are minimized. Multi-protocol label switching is set up which is essential for service provider and large networks. However this approach is value effective than LEQ design in this it needs product of variety of clients and variety of server methods to be designed.

D. In the Presence of Access Network Delay

In paper [9] and [10] access network delay depends on the technology used, For different access network types, the average access network delay can be: 180 millisecond for dial-up, 20 ms for cable, 15 millisecond for asymmetric digital subscriber line (ADSL). Multiple nodes may connect to the same client edge router through different access networks. The proposed LEQ routing in the backbone network can also be used in conjunction with Quality of Service

NOTATIONS FOR LATENCY EQUALISATION

Initially the basic hub selection problem is formulated without considering access delay and prove that it is NP-hard [15]. The key component of our LEQ architecture is the hub selection algorithm, which focuses on the problem of hub selection and the assignment of hubs to the client edge routers. Hubs are selected with the goal of minimizing the delay difference and the delay across all client edge routers. This shows that delay variations can be significantly reduced using the selected hub nodes as compared to shortest-path routing. It focuses on the client side routers.

NOTATIONS USED IN BASIC HUB SELECTION PROBLEM

FIGURE 2: HUB SELECTION NOTATION

$d(u,v)$	Propagation delay between router u and v
Sc_i	Set of servers associated with client edge router C_i
Hc_i	Set of nodes assigned to client edge router C_i
R	Number of servers associated with client edge router
N_s	Number of servers in the network
M	Total number of hubs
M	Number of hubs selected for each edge router

Hub Selection with Access Delays: we can partition clients of an edge router into four groups with access delays. The edge router forwards the packets from the new client to the hubs associated with its client group. We can sporadically measure access delay changes and accordingly we can assign the client to different delay groups accordingly

ALGORITHM 1 GREEDY ALGORITHM FOR BASIC HUB SELECTION

Step1. All the delays are sorted from client edge router C_i Server S through hub h in increasing order, which is denote as array A

Step2. For each $A[i]$, binary search to find the min delay difference:

For each delay $A[i]$ left = 0, right = dmax - $A[i]$

while (left not equal right)

$\partial_i = (\text{left} + \text{right}) / 2$

$l_i = \text{greedycover}(A[i], \partial_i, m, \{d(u,v)\}, d(j,k))$

If $(|l_i| > M)$ left = ∂_i else right = ∂_i ,

Step3. pick l_i with smallest ∂_i , if multiple solutions achieve the minimum ∂_i , pick the smallest $A[i]$. If $\partial_i = \text{dmax}$ then Output no solutions found.

Optimal Algorithm for $m=M$: We prune a candidate hub if the delay from edge router to server edge router through it exceeds the bound. Denote the records sorted in increasing order respectively

Step1. Let $A1$ and $A2$ be the candidate hub records sorted by their min delay and max delay in increasing order

Step2. For each $b_t \in A1$ in sorted order $l_t = \{b_t.h_i\}, \partial_t = d_{\max}$

For each $b_i \in A2$ in sorted order If $(b_i.\min d > b_t.\min d$ and $|l_t| < M)$ $l_t = l_t \cup \{b_i.h_i\}$
 $\partial_t = b_i.\max d - b_t.\min d$

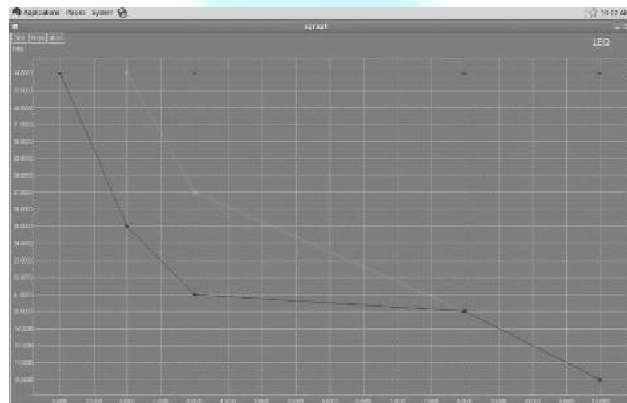
Step3. pick l_t such that ∂_t is the smallest

EVALUATION

The Latency Equalisation routing architecture is evaluated with and without access delay. Our evaluation uses several parameters which defines the routing architecture the total number of hubs M , the number of hubs selected as edge routers and randomly choose edge nodes as the location of servers. Then run the Latency Equalisation routing and shortest-path routing algorithms to compute the paths between these clients and servers. The LEQ path computation is based on the computed delay in the network. The computed delay of these networks based on the geographical distances between any two nodes. The delay and delay differences obtained using Open Shortest Path First routing are compared to the Latency Equalisation routing. This latency equalization is achieved using OSPF. In [11] the author mentioned the consistent with the working where they show that end-to-end delay can be reduced by packet indirection. The end-to-end delays of individual clients are not compromised. In a service provider network, OSPF weights are arranged for traffic engineering [11], and thus OSPF paths may not always leads to lowest delay paths.

A. Simulation

For the simulation we use two topologies AT&T and Telstra [12]. We run the LEQ routing and shortest path between client and servers Network topology is created for creation of nodes and transmission of packet in a simple network LEQ with and without compromising End-to-End Delay. The evaluation is between Open Shortest Path First and Latency Equalisation without compromising delay (AT & T network, $N_s=1, m=3$) Figure.3 is implemented with delay difference and delay. The average delay difference is 60%, but LEQ reduces the delay by LEQ scheme with packet indirection. In the case of with compromising delay 85% of reduction for both AT&T and Telstra topologies. In this topologies while providing more than five does not yield better significance improvement.



CONCLUSION

With multiple servers the Delay difference, Compared to LEQ, with Latency Equalisation routing the total number of servers does not have significant performance. This reduction improves the performance which is given below. The implementation in this paper is based on network support with Htrae support. It can predict latencies between machines which is mainly designed for game matchmaking. While using this nearly 90% delay is minimized. The prediction system Htrae is implemented where the Round Trip Time is calculated which yields minimum delay than OSPF and LEQ. Round Trip Time is the measure of time it takes for a packet to achieve a node and that latency will not change in the very near future.

RELATED WORK

In [1] the approach called Colyseus which support low latency gameplay also meet tight latency state. The method distributed hash table with additional interface method is used. The technique called box grouping technique and incorporating proximity routing where the architecture is used for multiplayer games. By using this approach nearly 60% is improved also leads to better scalability, load balance and to detect violations. In another paper [2] discrepancy occurs in online gaming that used a paradoxical outcomes and impose stringent constraints on responsiveness. The method called First person shooter is used where latency compensation method is used. The result called trading and training consistencies to manage fairness. Center server approach to improve the performance.

In [3], an approach called Quake II game traffic method is used to evaluate counter strike between client and server. As a result simulation on QoS metrics for adequate evaluation of simulation results. From LAN the measurement between client and server. The quality of graphics will continue to increase. For additional voice communication be incorporated in the online games soon. In the paper [4] the effect of latency in football games carefully designed between players. The technique called latency compensation mechanism leads to low, internet latency over compensating games. The result is latency difference is 500ms. To determine more effective ways to evaluate latency on passing performance and to determine their susceptibility of latency.

The author in paper [5] resolve the problem, an implementation called SAGLU (self-adjusting game lagging utility) technique can be used where an artificial delay is added. It automatically equalizes the participants delay. The delay equalization is done by knowing the participant such as IP address, port, also by adding this artificial delay the packet loss due to congestion is very less. SAGLU is like proxy between client and server. Delay adjustment algorithm is used to implement SAGLU. Delay based algorithm adapts to the transmission rate and improve TCP connections. Real time transport protocol is used. This congestion control algorithm is used along with TCP/RENO. It reduces the loss ratios and improve the bandwidth utilization while using algorithm the increase in transmission rate increases and reduce the congestion periods. Packet losses also adjusted by the transmission rate of various applications.

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