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AN ADAPTIVE APPROACH FOR TCP VARIANTS APPLYING WIRELESS MULTIHOP NETWORKS

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ABSTRACT

TCP- Transmission Control protocol is a connection oriented and reliable process-to-process communication on the transport layer of tcp/ip model. TCP guarantees with the end-to-end flow control, error control and congestion control. In the past, tcp was brought to work with the bulky networks where the cause of losses is specially the network congestion. TCP was introduced to work with the wired networks where the cause of losses is mainly the network congestion. In recent years, wireless networking is becoming more and more popular. Wireless Sensor Networks consists of hundreds and thousands of micro sensor nodes that monitor a remote environment by data aggregation from individual nodes and transmitting this data to the base station for further processing and inference. The energy of the battery operated nodes is the most vulnerable resource of the WSN, which is depleted at a high rate when information is transmitted, because transmission energy is dependent on the distance of transmission. In a clustering approach, the Cluster Head node looses a significant amount of energy during transmission to base station. So the selection of Cluster Head is very critical. An effective selection protocol should choose Cluster Heads based on the geographical location of node and its residual energy

KEYWORDS: TCP, wireless, NS 2.35.

I. INTRODUCTION

A growing number of devices are getting equipped with networking capabilities. Many of these devices are mobile and communicate using a variety of wireless technologies, such as Bluetooth, Wi-Fi, etc., which allow them to connect to existing telecommunication networks and to each other. If these devices also support routing, they can forward data for each other. One can then combine a number of such devices with minimal planning to form a network. Such a network would be an ad hoc multi-hop wireless network.

A multi-hop wireless network is a network of computers and devices (nodes) which are connected by wireless communication links. The links are most often implemented with digital packet ratios. Because each radio link has a limited communications range, many pairs of nodes cannot communicate directly, and must forward data to each other via one or more cooperating intermediate nodes. The user has found that Network coding techniques are used with wired networks and hence decided to design an algorithm with the network coding functionality for multi-hop wireless networks. To do this researcher has identified TCP New Reno protocol to be modified

A. Types of performance analysis

There are there techniques that are observed for analyzing the performance of wired and wireless network. Our observations are stated below.

Analytic Modeling

In this model we perfume analysis using numerical calculations with mathematics using probability, calculus, operation research, queuing networks, etc

Computer Simulation

Here modeling is developed on simulator where realization of physical behavior of developed network model is set and developed using probability, statics and queuing theory.

Real Time Physical Measurement

Actual test are performed over the network under this test. Generation of actual situation is done and test data are fed to the network situations. Each, actual data are sued for analysis.

Analytic model is pure mathematics base and so very tedious which if not computer with accuracy, may give us inaccurate results. Real Time physical measurement so not feasible approach especially when network includes hindered of modes and costly routers with costly other network components. This do not permit us to go with the option of costly Real Time Physical Measurement nor tedious and error pron Analytic Modeling. Thus, we have limited our study methodology up to network simulator as there are a number of advantages to this approach. Lower cost, ease of implementation, and practicality of testing large-scale networks. Simulators provide support for Applications, Protocols, Network Types , Network Elements and Topologies, can as implement Traffic Models using set dest..

II. RELATED WORK

In this sub section we summarize the most interesting capabilities, advantages, Base language and Type of existing simulation tools for wired and wireless networks in given table. Table 4.1 has all simulators considered in the previous section listed in the consecutive columns and main features and its base in the contest of all simulators in the consecutive rows, respectively.

Wireless Networks simulators exhibit different features and models. Each has advantages and disadvantages, and each is appropriate in different situations. In choosing a simulator form the available tools, the choose of a simulator should be driven by the requirements. Developers must consider the pros and cons of differ t programming languages, the means in which simulations is driven , component base door object oriented architecture , the level of complexity of the simulator, features to include and not include, use of parallel execution, ability to interact with real nodes, and other design choices[1][2]

III. METHODOLOGY

The central TCP mechanism here is for a connection to adjust its window size. A smaller winsize means fewer packets are out in the Internet at any one time, and less traffic means less congestion. A larger winsize means better throughput, up to a point. All TCPs reduce winsize when congestion is apparent, and increase it when it is not. The trick is in figuring out when and by how much to make these winsize changes. Many of the improvements to TCP have come from mining more and more information from the stream of returning ACKs
Fast Retransmit requires a sender to set cwnd=1 because the pipe has drained and there are no arriving ACKs to pace transmission. Fast Recovery is a technique that often allows the sender to avoid draining the pipe, and to move from cwnd to cwnd/2 in the space of a single RTT. TCP Reno is TCP Tahoe with the addition of Fast Recovery.

The idea is to use the arriving dupACKs to pace retransmission. We set cwnd=cwnd/2, and then to figure out how many dupACKs we have to wait for. Initially, at least, we will assume that only one packet is lost. Let cwnd = N, and suppose we have sent packets 0 through N and packet 1 is lost (we send Data[N] only after ACK[0] has arrived at the sender). We will then get N-1 dupACK[0]s representing packets 2 through N.
During the recovery process, we will ignore cwnd and instead use the concept of Estimated FlightSize, or EFS, which is the sender's best guess at the number of outstanding packets. Under normal circumstances, EFS is the same as cwnd, at least between packet departures and arrivals.[3][4]

At the point of the third dupACK, the sender calculates as follows: EFS had been cwnd = N. However, one of the packets has been lost, making it N−1. Three dupACKs have arrived, representing three later packets no longer in flight, so EFS is now N−4. Fast Retransmit had the sender retransmit the packet that was inferred as lost, so EFS increments by 1, to N−3. The sender expects at this point to receive N−4 more dupACKs, plus one new ACK for the retransmission of the packet that was lost. This last ACK will be for the entire original windowful.

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IV. RESULTS AND DISCUSSION

Input
N: the wireless sensor network
nn: the absolute amount of nodes in N
k: the accepted amount of clusters for each annular a : a node in N
T: a about called amount for acceptable a CH candidate
chance(a): the adventitious of the node to be CH, affected based on currentEnergy and ambit from BS
probability(a): accurate for the node which has chance(a) amount aloft beginning bucket(a): the node a is a affiliate for accidental alternative of CH candidate(a): a is a applicant for array head

Output
cluster(a): the CH of the node, which is a node from a part of nn nodes

Function
broadcast(data, ambit of distance); send(data, receiver); fuzzylogic(currentEnergy, ambit);
findMinDist(nodesX1[], nodesY1[], nwSize1, nodesX2[], nodesY2[], nwSize2, nodeIndex, clusterIndex) ;
/* FOR EVERY CLUSTERING ROUND */
/* SET-UP Phase */
/* AT NODE

send(data[currentEnergy, distance], BS);
/* AT BASE-STATION */
foreach node nn do
chance(a) < − fuzzylogic(currentEnergy, distance);
probability(a) ¡- false;
if (chance(a) > T) then
probability(a): true;
count++;
bucket(a);
else
probability(a):false;
end
end
candidate(a) = random(bucket); /* k different nodes are called about from "count" amount of nodes in "bucket[]", as applicant for CH */
amount = findMinDist(nodesX1[], nodesY1[], k, nodesX2[], nodesY2[], nn, nodeIndex, clusterIndex);
minCost = cost;
itr = count*count;
while itr do
candidate(a) = random(bucket); /* k different nodes are called about from "count" amount of nodes in "bucket[]", as applicant for CH */
cost = findMinDist(nodesX1[], nodesY1[], k, nodesX2[], nodesY2[], nn, chIndex, clusterIndex);
if (cost < minCost) then
minCost = cost;
cluster(a) = clusterIndex(a);
end
itr−−;
end
broadcast(cluster[], N);.

Here in simulation and results section, we present the output of experimental simu- lations to prove the effectiveness of the proposed approach. The proposed clustering algorithm for electing a cluster head in movable. The simulation results prove that the approach selected in the work reveals better performances

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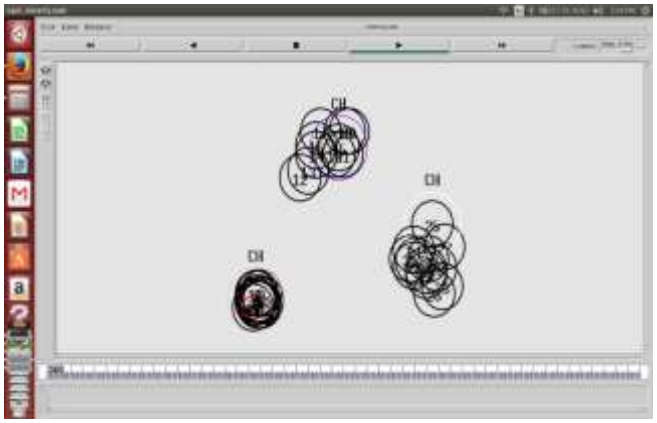
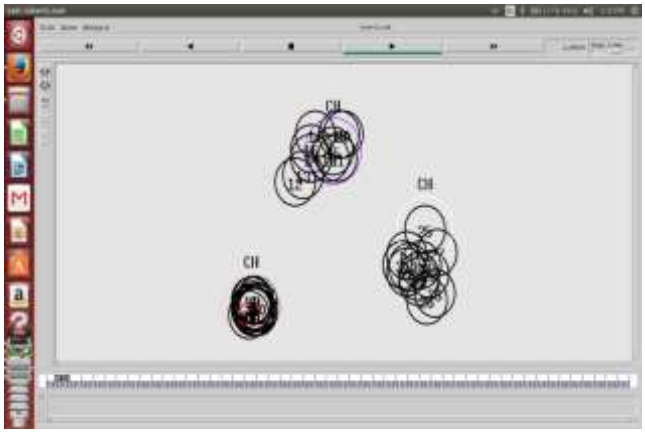
All nodes are in their own cluster and each cluster have their cluster head



Nodes are move in any direction as shown below.



Now the situation arise to move cluster

V. CONCLUSION AND FUTURE SCOPE

The arrangement life-time, which is abased on activity actual in the sensor nodes, is a above agency to be advised if designing WSNs. For an activity able WSN, abounding WSN architectures and absorption algorithms accept been proposed a part of which Leach is a mile-stone. LEACH makes use of the probabilistic archetypal for distributing activity burning of the CHs a part of the nodes. The agreement does not agreement for the adjustment and calculation of amount for CH nodes. Appropriately a poor array if start-up for a round, may aftereffect the all over performance[38]. LEACH-C is a centrally controlled agreement and produces bigger array forms by overextension the CH nodes all through the network. Along with free bigger clusters, the BS aswell ensures that activity administration is appropriately disconnected a part of all the sensor nodes.

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