A Novel Routing Protocol Based on Potential Difference and Transmission Rate

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Abstract:*We are proposing a dynamic routing protocol with a hybrid approach of potential fields and transmission in and out parameters. Potential difference computes the time stamp difference between two nodes and number of hops between nodes. Data transmission can be done in terms of QR vector model. In this paper we are proposing a novel routing protocol for optimal path identification based transmission in and out flow of the intermediate .This approach generates the dynamic and secure path with less time complexity and ignores the unnecessary path. Our proposed approach shows more accurate and efficient results than traditional approaches*

I.INTRODUCTION

Remote sensor networks (WSN), in some cases called remote sensor and actuator networks (WSAN),[1][2] are spatially appropriated self-governing sensors to screen physical or natural conditions, for example, temperature, sound, weight, and so on and to helpfully go their information through the system to a primary area. The more present day networks are bi-directional, additionally empowering control of sensor action. The advancement of remote sensor networks was inspired by military applications, for example, front-line reconnaissance; today such networks are utilized as a part of numerous modern and customer applications, for example, mechanical procedure observing and control, machine wellbeing checking, et cetera.

The WSN has worked off "hubs" – from a couple to a few hundreds or even thousands, where every hub is associated with one (or some of the time a few) sensors. Each such sensor system hub has commonly a few sections: a radio handset with an inward reception apparatus or association with an outer receiving wire, a microcontroller, an electronic circuit for interfacing with the sensors and a vitality source, typically a battery or an installed type of vitality gathering. A sensor hub may change in size from that of a shoebox down to the extent of a grain of dust, albeit working "bits" of certifiable minuscule measurements have yet to be made.

The expense of sensor hubs is correspondingly variable, running from a couple too many dollars, contingent upon the intricacy of the individual sensor hubs. Size and cost limitations on sensor hubs result in comparing imperatives on assets, for example, vitality, memory, computational rate and correspondences data transmission. The topology of the WSNs can fluctuate from a basic star system to a progressed multi-bounce remote cross-section system. The engendering strategy between the hops of the system can defeat [3].

A glance at sensor networks uncovers that the essential concern is to minimize the vitality use since the hubs are once conveyed and left after their battery life is over. It is definitely not pragmatic to supplant the battery as the size of arrangement is in a huge number of hubs and frequently the organization situations are blocked off regions like foe region, mines, atomic reactors and so forth. Different necessities like best system usage, guaranteed data transmission, limited postponement might be casual to meet the vitality streamlining necessity. The ideal approach to guarantee this is to assemble ways that transmit to a closest conceivable hub, and consequently utilize least conceivable a measure of vitality [4].

II. RELATED WORK

There is an alternate situation of sensor networks utilized as a part of modern procedures where sensors can be associated with perpetual force sources and there is no prerequisite for least vitality utilization. In such a case, the prerequisite is to augment spatial reuse and henceforth the most extreme measure of information that the general system can convey [5]. The deferral prerequisites might be stringent relying upon the procedure checked. For instance, a weight sensor checking weight inside an evaporator may not require sub -

second overhauls to information as increment in weight is a similarly progressive marvel. Though a comparative weight sensor checking change in weight inside a cryogenic motor may require exact millisecond upgrades. There exist a few systems to upgrade system usage for some known topologies, however for irregular and obscure topologies the outcomes are still a long way from ideal. On the size of stream particular parameters the subject of ensuring QoS to different streams in the meantime is generally unanswered.

Adhoc networks associated with remote connections that shape a subjective remote system topologies without the utilization of any unified access point or framework. Specially appointed remote networks are intrinsically self -creating, self-sorting out and self-overseeing [6][8]. With the expanded exploration in specially appointed networks in later a long time new application areas, for example, correspondence between versatile robots and between vehicle correspondence have advanced. Auspicious correspondence is fundamental to permit applications in these areas to be figured it out. The ongoing occasion based correspondence worldview has been perceived as a fitting abnormal state correspondence plan to interface independent segments in extensively dispersed control frameworks [7].

The effect of versatile impromptu remote qualities especially progressive portability, dynamic availability and restricted asset accessibility on ongoing assurances is examined. In the following segment we talk about the principle attributes of a versatile impromptu remote networks that effect ensured ongoing occasion based correspondence[9][10]. We tail this by an examination of how continuous assurances might be accomplished in a portable impromptu remote system also, complete with a prolog to our continuous work, a novel proactive directing and asset reservation convention that employments expectation and portability attention to decrease the progression of the portable remote environment.

III. PROPOSED SYSTEM

In this proposed work we are defining a hybrid protocol with potential difference and transmission in and out parameters. Transmission average can be calculated with mean of in packets and out packets during transmission of data packets through intermediate nodes. Data transmitted through highest transmission average based path of genuine or authenticated nodes for secure data transmission from source node to destination node in terms of QR vector model.

Advantages:

- Optimal path computation is possible with in and out transmission
- Data can be securely transmitted with QR vector model
- Potential factor improves the performance by choosing useful intermediate nodes

Modules:

Nodes construction:

This routing mechanism improves the performance of the routing over TCP IP protocol while transmission of data packets from source to destination, by computing the paths from source to destination, various mechanism uses various way to communicate with over network ,every node contains its independent transmission in and out packet details.

Transmission In and Out and Potential difference:

Potential difference i.e time span can be computed between transmission from one node to another if it is less than minimum threshold ignore the node and choose another path, otherwise check the next following node.

Input and output Reliability packet ratio table maintains number of packets transferred though particular relay node in last minimal time span R_{t1} ,where R indicates the relay node during the time span t1,here we consider the data packets transmitted in and out reliability ratio and status 'S' ,it indicates relay node successfully transmitted the received packets or not, for selection of optimal relay nodes in network.

Routing Implementation:

Nodes or vertices (V) and edges (E).the below graph shows G (V,E), here v indicates the vertices and E indicates the edge between the nodes indicates the weight between source to destination node pair .C indicates total cost between source and destination node Identification if shortest path is a NP hard problem, so we need to compute paths of all possible solution until we reach shortest path. In our proposed model along with cost factor we are considering the in and out reliability ratio of packet (IOR) it needs to be satisfied while computation of cost of the nodes. IOR ration can be maintained at a threshold value, if it meets minimum threshold, it can be set to "TRUE" ,so it can be considering while cost computation

.Let use consider a source node "A" wants to transmits some data packets to destination node "E" and B,C,D are intermediate nodes, path can be

based on highest data rating by computing average of in out packet transmission. The following table shows sample data rating table as follows.

In (data packets in Bytes)	Out (data packets in Bytes)
30	20
40	40
25	22
23	23
45	40
46	44

Data rating can be computed with average of in and out with respect to all intermediate nodes and data transmitted through highest rating path of genuine nodes.

In and Out transmission rate routing Algorithm :

Input: Source Node (SN),Destination Node(DN),IntermediateNode(IN),Cost=0,Path,I_t – In transmission, O_t—Out transmission,avg_diff=0,threshold (t) -user defined

Output: Optimal cost,final_path

Step1 : SN reads the in and out transmission values from next IN

Step2 :while (IN == DN)

GetIn_Out(IN)

Inavg : = sum(I_t)/No of transactions;

Outavg :=sum(O_t)/No of transactions;

Avg_diff:=Outavg-Inavg;

If(Avg_diff>threshold)

begin

Cost:=Cost + Avg_diff;

Path:=path+Path(SN,IN);

end

Next

Step3 : return optimal path to SN

- **MOD-ENCODER Encoding Algorithm:**
  - Input : M $\in \sum$, Δ value
  - N=|M|, i.e length of M
  - Z=n * bit size, i.e bit size is the number of bits require to represent each character
  - For i=1 to n

Read m_i the i^{th}character from M

Find RR[I]=I(m_i)%Δ

Find QQ[I]=I(mi)/Δ

- Representation of R
  - For I=1 to n
  - Represent R[I] in base Δ
- Representation of Q

- **MOD-ENCODER Decoding Algorithm:**
  - Input : Bi-tuple <R,Q>, Δ value
  - Convert Q from Base 10 to Base B
  - Let QB=(q1,q2,….qn) be the representation in Base B
  - Interpret R as a vector of Base Δ number
  - For $1 \leq i \leq n$
  - I=qi × Δ + ri

Where qi the ith digit of QB,ri the ith element of R.

- Mi=I-1(i)
- M=(m1,m2,….mn)

The encoded message is a bi-tuple of which, the first is a vector of quotients denoted as Qand the second is a representation of remainders denoted as Rwith respect to a modulus M. The secrecy of the message is retained by communicating Rover a secure channel using some standard encryption mechanism. The computation overhead is also reduced as the encryption is done only on one half of the encoded message

IV.CONCLUSION

We have been concluding our current research work with efficient over lay and underlay network, intermediate node can be chosen with transmission in and out rate average and data can be transmitted securely through mode encoder and decoder implementation in terms of quotient and reminder vectors. Our proposed implementation gives optimal results than traditional approaches in terms of security and performance.

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