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Efficient Video Streaming Using JOKER an Opportunistic Routing Protocol

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Abstract— The expansion in mixed media administrations has put vitality saving money on the highest point of current requests for cell phones. Shockingly, batteries' lifetime has not been as reached out as it would be alluring. Hence, lessening vitality utilization in each undertaking perform by this gadgets essential. In this work, a novel artful steering convention, called JOKER has been presented. The opinion present in both the applicant choice and coordination stages, has increased the performance in network supporting sight and sound traffic In the proposed system client has to send the request the videos to file server, and file server takes responsibility for distributing the frame to the neighbors. In this system we are considering the two neighbors, neighbour1 and neighbor2 and both neighbors are receiving the frames from file server alternatively, finally client receiving the videos from the neighbors. By using this proposed system we can reduce the time consuming between sender and user..

Keywords—Opportunistic routing, QoE, SOAR, ad-hoc networks, JOKER.

I. INTRODUCTION

Routing has become an important research issue in wireless sensor network. Many Opportunistic Routing networks have emerged which have become an interest for research community and due to having the factors of capability for enhancing; it has been attracting many researches. Routing is the central and one most important area of wireless ad-hoc and multi-hop network architectures. only some real world experimental study have investigated routing, in spite of several routing protocols proposed over the decade. Different routing protocol have been proposed to improve the performance. routing protocol have different behaviors than others for improving and maintaining the routing performance. The two different types of routing protocols are reactive (e.g. DSR) and proactive routing protocols (e.g. OLSR, BATMAN).The Opportunistic networks evolve from the Mobile Ad-hoc Networks called MANETs, which include various new functionalities that make them efficient use. These In specially appointed multi-hop systems, customary steering conventions, for example, OLSR [Link State Routing], AODV [Ad-hoc On-Demand

Distance Vector] or BATMAN (Better Approach To Mobile Ad-hoc Networking) compute a remarkable course
amongest transmitter and beneficiary. Along these lines, every hub just thinks of one as a single neighbor as the following jump to achieve guaranteed goal [1].Nonetheless, with deft directing conventions every hub chooses an arrangement of its neighbors, allude to as applicants, as the potential next jumps towards the last goal. The principle capacity of the Routing is course determination and information sending. The course determination incorporates selecting course between two hubs. The information transmission has finished by selecting the following hub or bounces to forward the information. The parcel sending in the conventional Routing approaches for multi-hop remote systems is finished by selecting the hub proactively at the sender.

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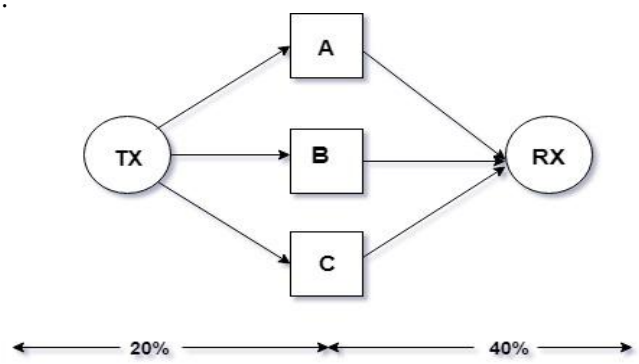

Figure1: Representation in which every transmitter node has various intermediate nodes for information transmission to the receiver node.

A. Motivation

The opportunistic routing can improve the network capability successfully compared with the deterministic routing, especially the packet delivery ratio between the sender and the candidate set (PDRsc). The PDRsc is define as probability the data packet dispatched by sender must be received by least one relay node in candidate set. The PDRsc been utilized in routing algorithms design. However, in the WSNs, the PDRsc changes as network topology changes to control and improve PDRsc and how this PDRsc affect routing performance is not investigated. There are two parameters can affect the performance of PDRsc in opportunistic routing (the number of node in candidate set and the packet delivery ratio between sender and one of its neighbors (PDRsc)) , so for improving the routing performance, the opportunistic routing algorithm should be able to aware and control:

1)number of relay nodes: opportunistic routing, large number of relay nodes means high PDRsc; however, the energy consumption and interference increase when the relay nodes is large the number of relay nodes in opportunistic routing should in an appropriate level;

2) link availability: the transmitted data packet received by the receiver is successful related to both the transmission power lost and the interference of the receiver; so for improving the PDRsc, this algorithm able to adapt the changing of transmission power loss and interference, especially in WSNs.. The key thought behind PDR is to utilize the tele-com nature of the remote system to such an extent that transmission from one hub can be caught by different hubs. Rather than picking the following forwarder hub early, the PDR picks the following hub progressively at the season of transmission. Consider the accompanying case as appeared in figure 1 , Here the source hub TX has three transitional hubs with bundle conveyance likelihood of 20%. Every transitional hub has bundle conveyance likelihood of 80% to the goal. Customary directing will pick as it were one transitional hub for information sending, while Opportunistic Routing will consider every one of these hubs for information sending. Therefore, Opportunistic Routing turns out to be more productive and dependable than customary directing.

II. RELATED WORK

A.SOAR SOAR[2] is opportunistic Adaptive Routing and proactive link state routing following optimization is done in SOAR for best performance in larger range topology in traffic demands. By considering the present network topology in current network re transmissions. forwarding node selection is main task in routing. This forwarding nodes coordination improves throughput. In SOAR, this nodes are selected based on priority timer. The SOAR performs as follows: 1. Deciding Adaptive Transmission Path: In SOAR, the sending hubs determination relies on default way. basic Path is utilizing ETX metric. The ETX metric determined by quantity jumps expect to transmit data to receiver. In the pool of path default path is having minimum ETX. The constraint has been given for selecting forwarding nodes from the default path is given by (2): a) The forwarding node's ETX to the destination is lower than the node's ETX (in default path) to the destination. b) The forwarding node's ETX to default path node is within a threshold. c)Each forwarding node is near in any event one node at the default path(i.e., with ETX underneath an edge).(i.e., with ETX below a threshold). d) The ETX of a link between any pair of forwarding nodes is within a threshold. Forwarding nodes assigned with priority and uses forwarding timer for each packet transmission to avoid replicate transmission as well as re-transmissions. recovery used in this forwarding nodes is used to backup, it transmits data if the data doesn't reach destination[3]. SOAR utilize rate control by sending rate adapts along path capability to transmit the data to destination and it uses end to end acknowledgement. . priority based forwarding timer schedule and uses ETX metric to allot priority. But SOAR doesn't use batches as like EXOR, because it needs more computations[4].

B. POR POR [5] is a Position based Opportunistic routing which uses location information, to utilize wireless medium. POR uses MAC dependent opportunistic routing technique. POR, this forward node is selected based on destination node near to destination. This property improves the robustness and scalability of POR. These alteration is done in MAC layer to support uni-cast and multicast transmissions. These MAC address interrupt uses advantages of this collision avoidance supported by 802.11. If the packet doesn't forward in a certain time, this function is called to reroute the packet. Interface queue is maintained in between the logical link layer and MAC layer to avoid duplicate transmissions. In POR, every node maintains local information. Every node has neighbor record Id, packet buffer and packet list. Forwarding table is build by local information gathered by using neighbour list and it consists of destination Ip, forwarder list and forwarder number. Whenever node receive packets, it require some time to forward this packets after its added in packet list. By using forwarder list in each node, the node determines the candidate node to forward the packets. Packet buffer is used to cache the packets, if the node doesn't find the forwarder. POR gives more throughput's and the drawback is it needs more computational resources and buffer space.

C. Geographic Random Forwarding for Ad-Hoc and Sensor Networks: Multiple hop Performed: In this paper [6], the creator proposes the plan called Geo-graphic Random Forwarding, which depends on geographic routing. In the remote system, the handoff hub is definitely never knew by

the sender yet is chosen after the transmission. It utilizes the broadcasting way of the remote system. topology are haphazardly changed, sender hubs is not aware which neighboring hub will go about as a hand-off hub. Subsequently, to manage conflict at the beneficiary end, the creator has proposed the above plan. The fundamental thought of the paper is as per the following: The sender hub just communicates the bundle alongside its own area and goal area. All the listening hub in the neighbor will get the bundle and in view of the possess separate from the goal, they organize themselves to go about as hand-off hub. The handed-off bundle is then sent to a tele-com address which additionally contain transmitter and last goal area

III. METHODOLOGY

The expansion in mixed media administrations has put vitality saving money on the highest point of current requests for cell phones. Shockingly, batteries' lifetime has not been as reached out as it would be alluring. Hence, lessening vitality utilization in each undertaking performed by this gadgets is essential. In this work, a novel artful steering convention, is known as JOKER, is presented. this presents oddities in both the applicant choice as well as coordination stages, which increase the performance of network supporting sight and sound traffic In the proposed system client has to send the request the videos to file server, and file server is distributing the frame to the neighbors. In this system we are considering the two neighbors, neighbour1 and neighbor2 and both neighbors are receiving the frames from file server alternatively, finally client receiving the videos from the neighbors. By using this proposed system we can reduce the time consuming.

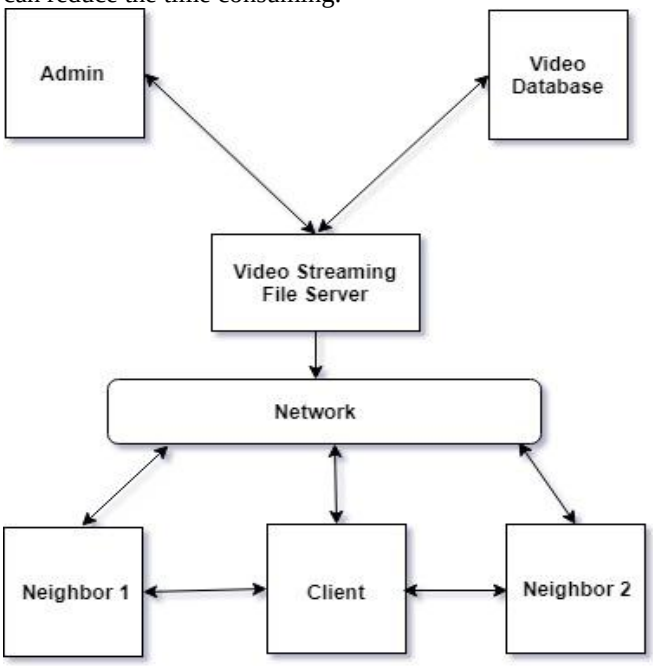

Figure 2: System Architecture

A.Pseudo code for File Server – Upload Video

Input: Receive Video from Admin

Output: Upload in the file server system

Steps:

1. Start the receive listener Thread for receive the video from Admin
2. Receive the video name and keep in respective variable
3. Receive the video data from the admin
4. Write the video in the specific name.
5. Show the message box of "Upload success"
6. Otherwise
7. Show the message box of "Upload Fail"
8. Update the video details in database
9. Fetch and display all video names in the drop down list

Stop

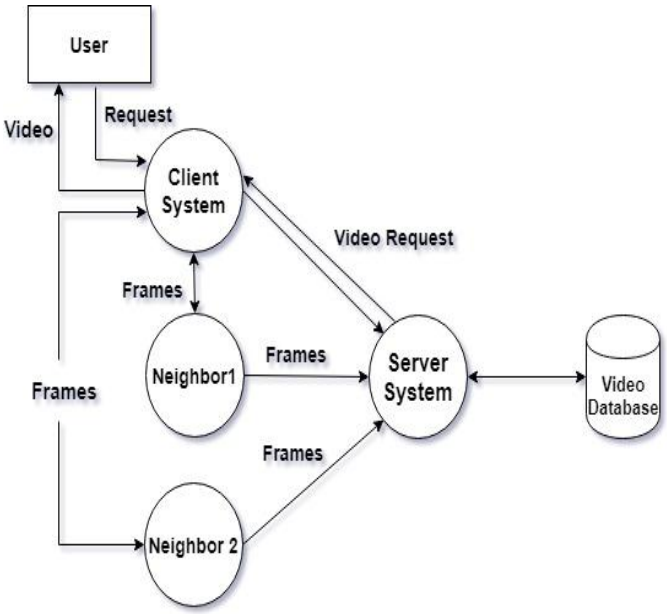

Figure 3: System Flow

B: Pseudo code for File Server – Video to Frame conversion

Input: Client Requests a Video

Output: Converts the video into set of frames

Steps:

1. Read the client requested video name
2. If the filename !=null
   a. Create the Object for IMedia Reader class of Xuggler API
   b. Call the makeReader method Toolfactory class.

c. Assign the instance of Toolfactory to IMedia Reader
d. Get the frames from ImageSnapListener.
e. Store in local drive.
f. If there is no further frames in the video
    i. Stop the Frame conversion process
g. Else
    i. Continue to Frame Conversion

3. Else
    a. Display the Error message ”File name is Empty”
4. Stop

C: Pseudo code for File Server – Frames Distribution

Input: Client Requests a Video
Output: Converts the video into set of frames
Steps:

1. Start
2. Read the Frames for the client requested video
3. Declare the variable count =0;
4. For i=1 to N (Number of frames)
    a. If(count==0)
        i. Send the frame[i] to client
        ii. Count++;
    b. Else if (i==1)
        i. Send the frame[i] to Neighbour 1
        ii. Count++;
    c. Else if(i==2)
        i. Send the frame[i] to Neighbour 2
        ii. Count=0;
    d. End
5. End

D. Pseudo code for Client – Video Request & Play

Input: Select a Video to download & play
Output: Receive the frames from File Server & Neighbor 1 & Neighbor 2
Steps:

1. Select the Video name from the drop down list
2. Click on Request button
3. The request will be transferred to the File Server
4. File server will divide the frames of video
5. Client and Neighbors receive the frames simultaneously
6. After sending all frames from the file server, client will get the acknowledgement from File Server
7. Client will request to Neighbor 1 and Neighbor 2 for to get their frames in client window.
8. Then the client will re-arrange the frames and it will store in array
9. Finally Iteration of the array will be perform
10. Now playing will be done
11. Stop

IV. RESULTS AND DISCUSSION

In this work, an opportunistic routing protocol, called JOKER, addressing the trade-off between QoE in multimedia transmissions and energy consumption has been presented. Following the opportunistic paradigm, JOKER presents novelties in both the candidate selection, where a new metric that gathers the packet-delivery reliability of the links with the distance-progress towards the final destination has been introduced, and the candidate coordination, where two different procedures were included, namely, ACK-based and timer-based coordination schemes. In the proposed system client has to send the request the videos to file server, and file server takes responsibility for distributing the frame to the neighbors. In this system considering the two neighbors, neighbour1 and neighbor2 and both neighbors are receiving the frames from file server alternatively, finally client receiving the videos from the neighbors.Additionally, a dynamic adjustment of the protocol’s control-message sending interval was developed aiming at adapting JOKER to the actual network conditions and reducing energy consumption as well.

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