Energy Efficiency QoS Assurance Routing in Wireless Multimedia Content Deliver Network

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Abstract— The problem of low penetration of multicast and QoS enabling mechanisms in IP networks, overlay network techniques are used that avoid undue duplication of Multimedia streaming flows while transcoding or scalable encoding can be used for graceful adaptation of the stream to the capabilities of access systems. The idea described in this paper is based on a flexible network independent platform which can be easily deployed through the use of personal computers. It employs overlay network solutions for setting up the media distribution scheme, independently from the underlying network. It incorporates mechanisms for dynamic setup and discovery of nodes, adaptability to network conditions and self- configuration, Route Maintenance with help of AODV .The design and implementation of the Relay Modules, an essential element in such an architecture, is outlined. It can be deployed at low powered end systems, simple PCs or even IN complex scenario and successful tests have been carried out demonstrating using NS2 simulation tool that this implementation can be easily and transparently deployed on top of any underlying network. Content Delivery Networks.

Keywords - AODV, QoS, Routing, Multicast, Multimedia Streaming, Throuput.

I. INTRODUCTION

Content Delivery Networks consists of many mobile nodes that act as both hosts as well as router in the free space air. Hence Content Delivery Networks works without any pre-existing infrastructure. Since the quality of service is big challenge in the field of wireless Content Delivery Networks [2]. Since mobile nodes are plug-n-play devices they have to face many issues in many applications of wireless communications. The field of wireless networking emerges from the integration of personal computing, cellular technology, and the Internet. This is due to the increasing interactions between communication and computing, which are changing information access from “anytime anywhere” into “all the time, everywhere.” At present, a large variety of networks exist, ranging from the well-known infrastructure of cellular networks to non-infrastructure wireless content delivery networks. When any link of a multi-hop communication path breaks, the path must be repaired or reconstructed. During this period, packets may be dropped. This loss of packets will affect quality of service (QoS) for both real-time and non-real-time applications and cause significant throughput degradation. So, we propose different workload with some parameter variations of the Content Delivery Networks to evaluate performance metrics. There are different mobility models are available depends on mobility character. Based on Random way point mobility model, each node’s movement consists of a sequence of random length intervals called mobility epochs during which a node moves in a constant direction at a constant speed. The speed and direction of each node varies randomly from epoch to epoch. There are different types of mobility.

2. Routing Protocols

There are different types of routing protocols are available, that is proactive, reactive and hybrid protocols. Reactive routing protocols for Content Delivery Networks are also called “on-demand” routing protocols. In a reactive routing protocol, routing paths are searched only when needed. A route discovery operation invokes a route-determination procedure. The discovery procedure terminates when either a route has been found or no route is available after examination for all route permutations. In a content delivery network, active routes may be disconnected due to node mobility. Therefore, route maintenance is an important operation of reactive routing protocols. Compared to the proactive routing protocols for content delivery networks, less control overhead is a distinct advantage of the reactive routing protocols. AODV, which is a reactive protocol.

3. AODV Description

The AODV routing protocol supports multi-hop routing among mobile nodes for establishing and maintaining an ad hoc network. AODV uses hop-by-hop routing. AODV is based on the Destination Sequence Distance Vector (DSDV) routing protocol. It borrows the conception of sequence numbers from DSDV, plus the use of the on-demand mechanism of route discovery and route maintenance from DSR. It is called a “pure on-demand route acquisition system”; nodes that do not lie on active paths neither maintain any routing information nor participate in any periodic routing table exchanges. It is loop-free, self-starting, and scales to large numbers of mobile nodes.

4. CDN Architecture

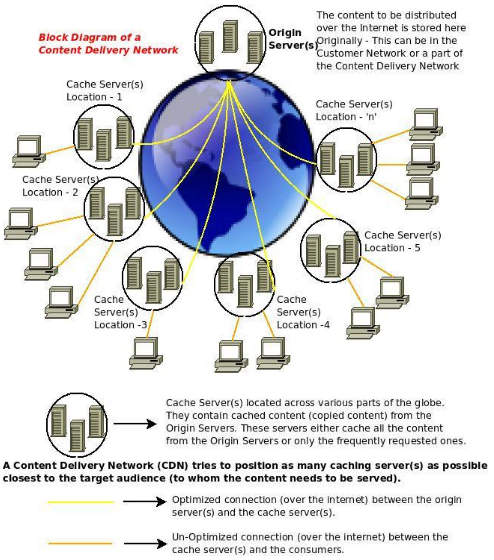

Fig 1: CDN Architecture

AODV operates on a series of request and responses to requests. Node constructing the route to another node sends to all the request (RREQ). The task includes the source and destination IP, the current time according to a source [15] and the time of last known connection, known by the source [10] and the request ID (0xFF). Each node receiving the request 0xFF updates temporary routing table to the source, and:

- ❖ If previously received a request from the source 0xFF, ignores it.
- ❖ If is the destination, or knows newer route (eg. with time 12) sends RREP to the source.
- ❖ If not, propagates the request.

Each node after receiving the response to its request, updates routing tables and forward answer to the source. Source, after received the answer begins sending. If it receives a reply later with a shorter or newer route, continues sending by the new route. Entries in the routing table are removed after some time since last use. In addition, the failed connection causes sending back an error message (RERR) and initiates determining a new route. AODV also supports multicast routes.

5.Features

As reactive routing protocol, AODV reacts relatively quickly to the topological changes in a network and updates only hosts that may be affected by the change. However, AODV tends to cause heavy overhead due to the flood search triggered by link failures. As a result, AODV does not perform well in heavy load or content delivery networks.

Main advantages are:

- ❖ algorithm is nor computationally or memory complex,
- ❖ data transfer does not generate additional traffic,
- ❖ scalable, suitable for mobile networks,

supports multicasting, tries to minimize the number of

required broadcasts.

6. Simulations Results

The figures shown below are the results of evaluated measurements of the proposed scenarios. The results show the different characteristic measurements of different data byte variations of Content Delivery Networks. The following figures shows the evaluation results.

Result Analysis

The figures shown below are the different parameter metrics of quality of service in of the proposed variation of the network.

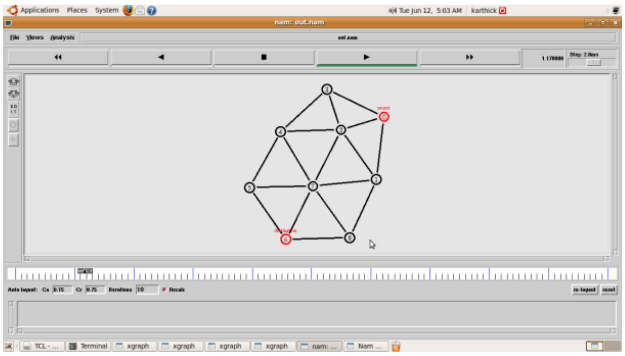

Fig 2

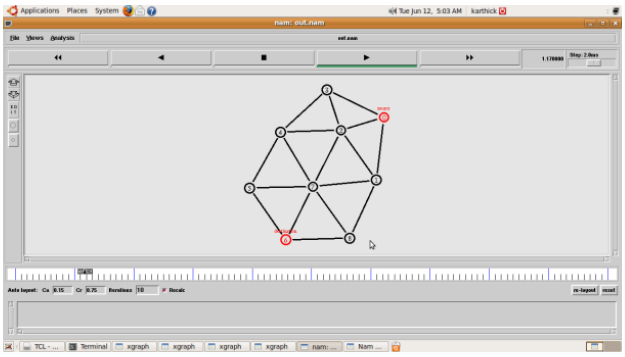

Fig 3

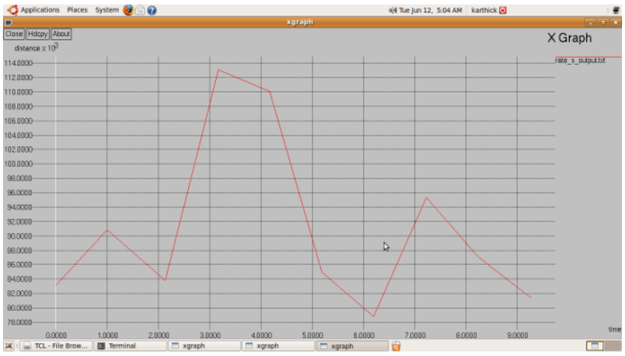

Fig 4

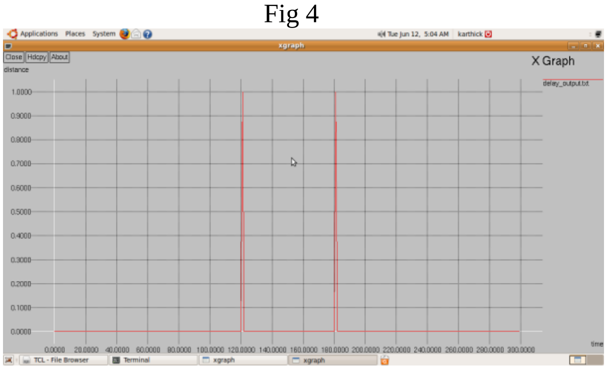

Fig 5

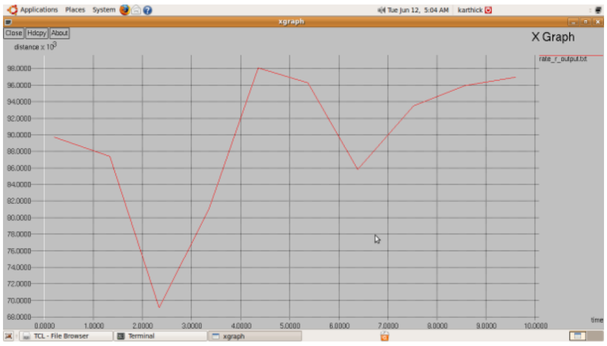

Fig 6

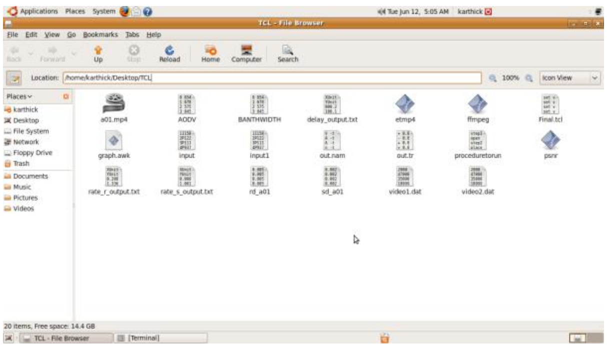

Fig 7

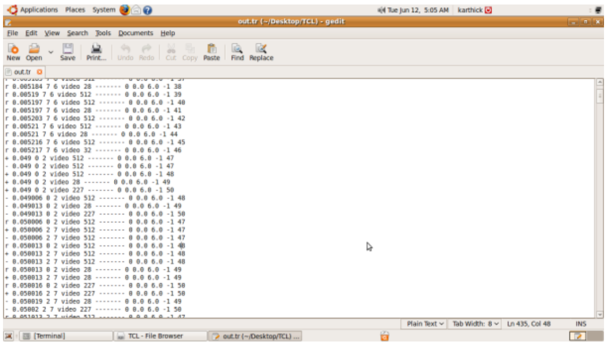

Fig 8

above figure shows the result obtained for average of the network. The performance of this experiment shows the different result for different data size variation even though there is no change in the network. In throughput the data size increases the throughput of the network also increases very high. The shows delay decreases in the low data and for high data it increases the delay randomly. In the results shows that the low data rate there is decrease in the network. For medium data rate it shows some moderate results where as in the high data it delivers high. From this we conclude that there is a variation in the size of the packet then there is a change in the results of the same network. The further experiments were going to evaluate at different parameter changes for different layers in the Content Delivery network.

CONCLUSIONS

These performance metrics are used to know how the characteristics of AODV protocol in CDNs differs in different parameters change scenarios. This proposal gives very high throughput and small delay in quality of service AODV protocol of Content Delivery network. In future, more proposal and many metrics will be explored for providing scalable CDNs.

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