A Falsification-Opposing Direction Structure in Wireless Multi-hop Network for Video Traffic

Sadia Tazeen1, Prof. Amareshwari Patil2

Abstract— **Consider a remote system where the application streams comprise of video movement. Due to traffic, compression at the source & interference video streams get disturbs and errors occurred. To overcome this problem of the video frame loss process constructs an analytical framework to capture the impact of routing on video distortion. The framework permit us to develop a routing policy for reducing distortion based on which design a protocol for routing video traffic. Via simulations and testbed experiments that this protocol is effective in reducing video distortion and minimizing the user experience degradation. The use of the protocol increases the PSNR of video flows by as much as 20% producing flows with an MOS that is on the average 2-3 times higher compared to the case when traditional routing schemes are used. These PSNR and MOS gains project consequential improvements in the perceived video quality at the destination of a flow.**

Index Terms— ***Routing protocol, Reducing video distortion, Video communication, Wireless network***

1) INTRODUCTION

With the advent of smart phones video traffic has become very popular in wireless networks. In tactical networks or disaster recovery, one can envision the transfer of video clips to facilitate mission management. Maintaining the quality of the video is critical. Video quality is affected by the losses occurred in transmission packets and the distortion due to both wireless channel induced errors and interference. To protect from losses better encoding standard are used that are MPEG-4 or H.264/AVC. [4]MPEG-4 is a standard used to compress audio and video data. The intention behind [2] H.264/AVC (Advanced Video Coding) was to provide good video quality at substantially lower bit rates than previous standards. Further it also provides enough flexibility to allow the standard to be applied to a wide variety of applications on a wide variety of networks and systems. MPEG-4 or H.264/AVC define groups of I, P and B type frames that provide different levels of encoding and protection against transmission losses [2]. The end- to-end flow of a video shows the performance of the video quality. Examine the effects of packet losses patterns and specifically the length of error bursts on the distortion of compressed video [4] [5]. Typical routing protocols are design for the transmission & receiving of packets without losses from source to destination. These losses will results into some amount of distortion. The value of the distortion is measured by the unrecoverable frame in the GOP (Group of Pictures) along the path from source to destination. The solution of this problem is to consider an analytical model to characterize the dynamic behavior of the process which describes the frame losses in the GOP as the video is delivered on an end-to-end path. Analytical model couples the functionality of the physical and MAC layer of the network with the application layer for a video clip that is sent from source to destination node. An analytical model is built for multi-layer approach. Main problem in the wireless sensor networks is routing. To resolve these problems following a dynamic programming approach which effectively captures the evolution of the frame loss process by using this generating a practical routing protocol to minimize routing distortion.

2) RELATED WORK

In the literature, many approaches have been explored related to video communication. [2]The prime goals of H.264/AVC are improved coding efficiency and network adaptation. H.264/AVC has achieved an eloquent improvement in rate-distortion efficiency as comparative to the existing standards. ETX is based on delivery ratios, which directly infect throughput. The prime goal of the ETX design is to find paths with high throughput, despite losses. Total numbers of transmission packets (including retransmissions) that are provided to the ultimate destination are minimized by the ETX. The review describes the design and implementation of ETX as a metric for the DSDV and DSR routing protocols. [4] high-priority protection (HiPP) method is proposed where the MPEG video stream is split into high- and low-priority partitions. The high- and low-priority data and resilient data are sent over a single channel using a packetization method that maximizes resistance to burst losses, while minimizing delay and overhead.

[5] Layered coding (LC) and multiple descriptions coding (MDC) have been prefer as source coding capabilities that are robust to channel errors for video transmission. They both generate multiple sub-bitstreams, and it is permissible to drop some portion of the data from the sub-bitstreams during transmission for both methods. [9] The error-resilience capabilities of these two encoding techniques through extensive experimentation. This provides the most comprehensive performance comparison yet between LC and MDC. [6]Layered coding provides a scalable representation that enhances rate-control but it is sensitive to transmission losses. In multiple descriptions coding resilience of packet losses will be increased by creating multiple streams that can be decoded independently. The packet transmission schedules can be optimized in a rate-distortion sense where layered coding provides a better performance. [11] A recursion model is derived that relates the average channel-induced distortion in successive P-frames. The model also takes into account the two new features of the H.264/AVC standard that is intra prediction and in-loop deblocking filtering. This model allows one to easily evaluate the impact of a single frame loss.

3) SYSTEM DESIGN

Above design model shows that source node has to send the video to the particular destination by taking optimal path for that source node has to sample the network during the path discovery process.

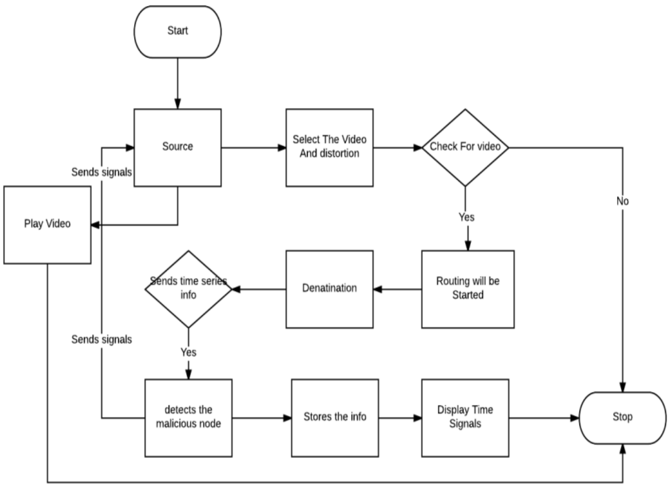

Fig 1: System Design

From source node a route request message will be send to the server. After sending a message source node get a pop up message about that request has send to server. The multiple description coding (MDC) techniques fragments the initial video clip into a number of sub streams called descriptions. The descriptions are transmitted on the network over disjoint paths. These descriptions are equivalent in the sense that any one of them is sufficient for the decoding process to be successful; however the quality improves with the number of decoded sub streams. Server node display that video is received & played. There are two cases where video can select the distortion resistant routing which may lead to the normal node; another case is that requesting for a video file can be distorted. Distorted file can detect the node where the damage has been occurred. By distortion resistant routing resist the malicious node and played at the destination node.

4) PROPOSED SYSTEM

Thesis is that the user-perceived video quality can be consequentially improved by accounting for application requirements, and specifically the video distortion experienced by a flow, end-to-end. Typically, the schemes used to encode a video clip can accommodate a certain number of packet losses per frame. However, if the number of lost packets in a frame exceeds a certain threshold, the frame cannot be decoded correctly. A frame loss will result in some amount of distortion. The value of distortion at a hop along the path from the source to the destination depends on the positions of the unrecoverable video frames (simply referred to as frames) in the GOP, at that hop.

The main benefaction is that construct an analytical model to characterize the dynamic behavior of the process that describes the evolution of frame losses in the GOP (instead of just focusing on a network quality metric such as the packet-loss probability) as video is delivered on an end-to-end path. Represent how the choice of path for an end-to-end flow affects the performance of a flow in terms of video distortion. This model is built based on a multilayer approach.

5) METHODOLOGY

Out-dated routing metrics designed for wireless networks are application-unsure. Consider a wireless network where the application flows consist of video traffic. From a consumer viewpoint dropping the level of video distortion is crucial popular link-quality-based routing metrics (such as ETX) do not account for dependence across the links of a path as a result video flows to converge onto a few paths and thus cause high video distortion. The framework allows us to formulate a routing policy for minimizing distortion based on which design a protocol for routing video traffic. Via simulations and tested experiments that it is effective in reducing the end-to-end video distortion and keeping the user experience mortification to a minimum.

***Simulation results*:** Use the network simulator ns-2. The simulator provides a full protocol stack for a wireless multihop network based on IEEE 802.11. Then extend the functionality of ns-2 by implementing routing scheme on top of the current protocol stack.

***Testbed Experiments*:** Implementing the scheme using the Click modular router. Then implement two different mechanisms and experiment with each, one after another. The first mechanism estimates the ETX value for each link between a node and its neighbours for all the nodes in the network. The mechanism broadcasts periodically (every 1 s) small probe messages of size 32 B and checks for acknowledgments from the neighbors of the node. The routing policy computes the minimum ETX path from the source to a destination and uses that path to transfer the video packets. The second mechanism implements the protocol defined in order to compute the routes on the wireless network that achieve minimum video distortion.

6) EXPERIMENTAL RESULTS

By using routing protocol for an optimal path video transmission will be effective. Formulating an analytical model that effectively captures the area where the video is damage. Following are the some snapshots how the distorted node is detected.

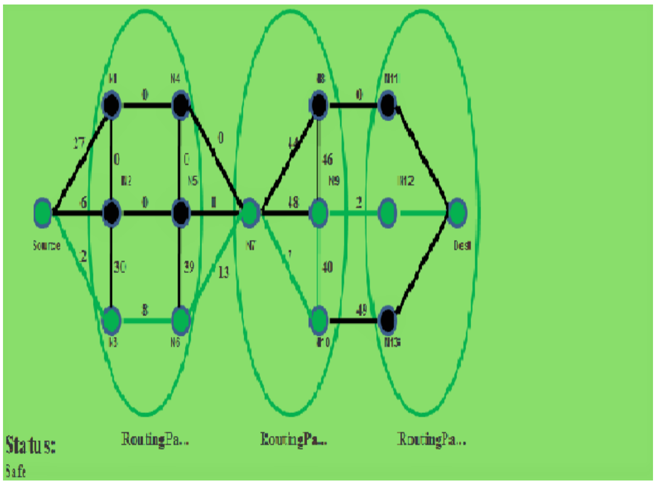

Figure 2: Optimal path routing

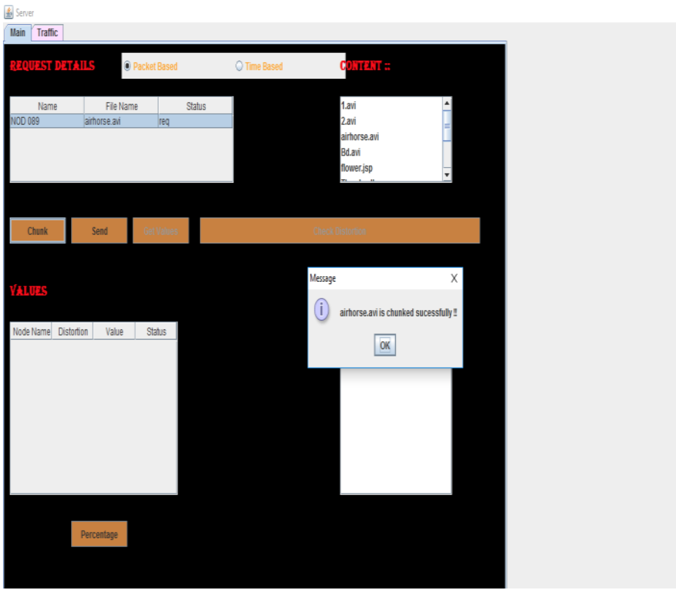

Figure 3: Video file chuncked successfully

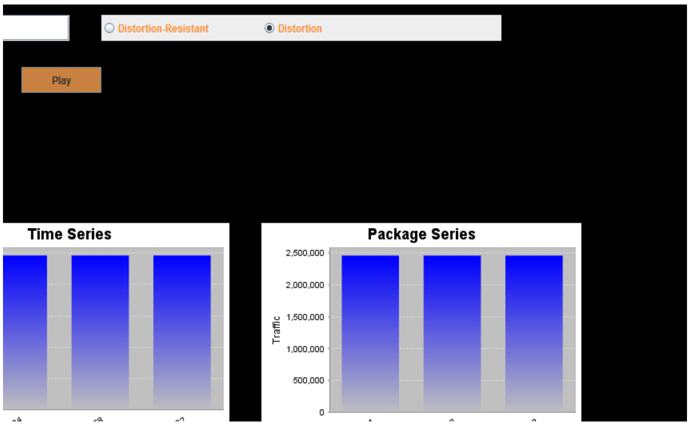

Figure 4: Time & Package series

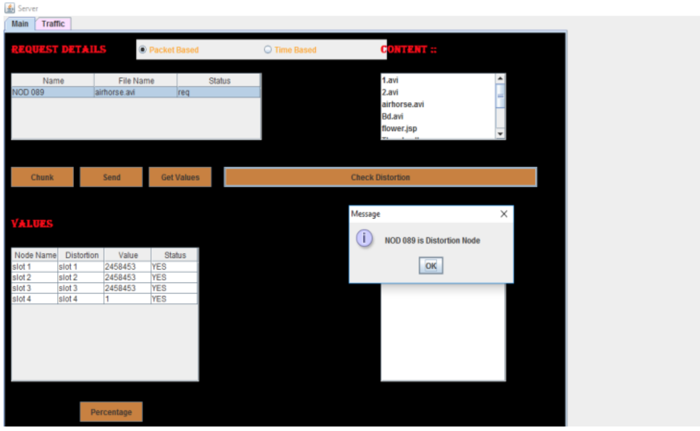

Figure 5: Malicious node detected

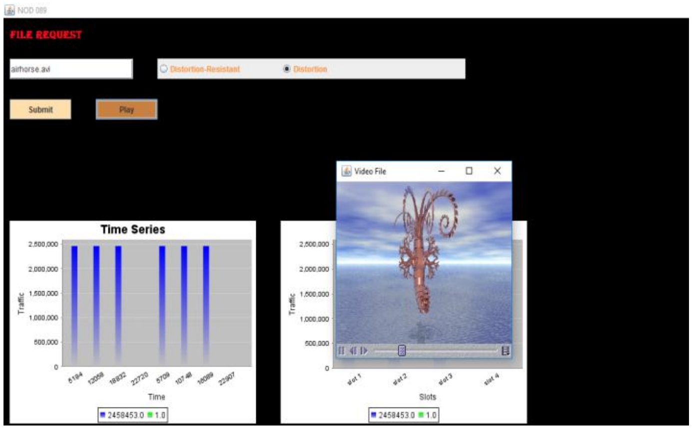

Figure 6: Video displayed at destination

7) CONCLUSION

The routing policy is application- aware is likely to provide benefits in terms of user-observed performance. Consider a network that primarily carries video flows. To understand the impact of routing on the end-to-end distortion of video flows. Toward this, construct an analytical model that ties video distortion to the underlying packet-loss probabilities. Using this model, finding the optimal route (in terms of distortion) between a source and a destination node using a dynamic programming approach. Unlike traditional metrics such as

ETX, approach takes into account correlation across packet losses that influence video distortion. Based on this approach, design a practical routing scheme then evaluate via extensive simulations and testbed experiments. The simulation study shows that the distortion (in terms of PSNR) is decreased by 20% compared to ETX-based routing. Moreover, the user experience degradation due to increased traffic load in the network is kept to a minimum.

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