Abstract

Mobile Ad-hoc Network is capable of clearing lots of challenges involved in the real-world communication. They are used in emergency response schemes, military field operation, oil drilling and mining operations. Transmitting video over MANET is an active research area due to their potential wide spread applications. In the last decade, both mobile and multimedia communications have experienced unequal rapid growth and commercial success. However, transmitting multimedia flows over wireless Ad hoc network remains an extremely challenging issue due to the limited battery lifetime of the wireless nodes. Providing good quality end-to-end video communications over mobile ad-hoc networks is more challenging due to the dynamically changing topology of the ad-hoc networks and the unreliable wireless channels. Multiple Description Coding (MDC) is an effective coding approach to enhance the error resilience of video transmission over any lossy networks. When MDC is combined with multipath transmission, MDC enables traffic dispersion and it alleviates the error propagation caused by the packet losses and hence reduces the network congestion. The error prone nature of the adhoc network always causes the frame to get corrupted. When MDC is used with such a network, it uses these corrupted frames as a reference frame and through motion compensation it compares the current frame with the reference frame and leads to error propagation throughout the network which results in video quality degradation. So, in this work, routing
messages of AOMDV is used as the feedback messages after estimating the packet loss in the network and video coding is adapted accordingly with respect to the feedback messages and thus the quality of the received video is improved. AOMDV also saves the energy of the nodes by multipath routing. This work deals with comparing video quality using MDC, MDC with feedback based SMR (Split Multipath Routing) and MDC with feedback based AOMDV (Ad-hoc On demand Multipath Distance Vector routing). The experiment has been conducted using NS2 simulator along with EvalVid for evaluating the video quality. The results demonstrate that MDC with feedback based AOMDV gives good PSNR value under different packet loss rate and guarantees good video quality for large number of users in the network and at the same time the PSNR is examined by varying the number of nodes in the network resulting in decreased PSNR while trying to increase the number of nodes involved in the network.

References

- Apostolopoulos, J. G., "Reliable video communication over lossy packet networks"


**Index Terms**

- Computer Science
- Mobile Networks

**Keywords**

- Ad-hoc Network (MANET)
- MDC (Multiple Description Coding)
- AOMDV (Adhoc On demand Multipath Distance Vector routing)

- packet loss estimation
- frame corruption probability determination

**Reference Picture Selection (RPS)**

- video communication
- PSNR (Peak Signal to Noise Ratio)