Efficient utilization of various network coding techniques in different wireless scenarios

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The nodes of a communication network use network coding technique for generating packets for output links by systematically processing the packets received on its input links such that the original packets should be recovered by the destination nodes. Under low traf- fic conditions higher bandwidth efficiency and power efficiency can be achieved using network coding but the performance degrades as the traf- fic in the network increases. Overall performance of the network can be improved if the node is able to take a decision about whether to use or not to use network coding under the current condition of the network. This work presents a scheme for finding out a threshold value below which network coding should be used and above the threshold normal forwarding operation should be adopted by the nodes. The performance of the proposed algorithm on Cross topology under different network coding schemes has been tested under simulation environment i.e. on NS-3. Significant improvement has been observed as compared to only network coded systems as well as the traditional store and forward systems.

Coding Gain (CG)

Linear Network Coding (LNC)

Maximum Flow Min Cut (MF-MC)

Network Coding (NC)

Random Linear Network Coding (RLNC)

Throughput

XOR

Codes (symbols)

Efficiency

Linear networks

Throughput

Bandwidth efficiency

Coding gains

Destination nodes

Min-cut

Random Linear Network Coding

Simulation environment

Wireless scenarios

XOR

Network coding