ABSTRACT

Efficient Network Applications require efficient routing mechanisms in order to work effectively. Efficient working of these applications can be achieved by using best and appropriate routing techniques, rather than the legacy routing mechanisms. The existing algorithms can be improved by adding a Genetic based approach. By this approach, the user usually encounters a problem called the Constraint Satisfaction Problem (CSP), which has to be dealt with.

Genetic Algorithms can be used for selecting an optimal route in applications. This, based on CSP, requires a mechanism for automatic discovering topology and also methods for learning the capacity of the network infrastructure. Simple Network Management Protocol (SNMP) along with Management Information Base (MIB) provides the required data for Topology discovery and also to learn the information about the current network capacity along with various bottlenecks present in the topology. Since the shortest path is not always the best path, our genetic algorithm will provide the optimal route based on CSP and application sensitivity.

The earlier algorithms focuses on the five different QoS (SNMP variables) parameters viz., Bandwidth, Latency, Delay, Throughput, Dropped Packets Measure and Transmission Time to gauge the performance of a network. With the Genetic Algorithm methods, enhancements are observed in terms of functionality.

An enhancement is provided by automatic discovery of network topology for optimizing routes using Genetic algorithms. A modified form of Dijkstra’s (Genetic)
algorithm is used for finding the optimal route as opposed to the traditional shortest path. The constraint for the genetic algorithm can be modified according to the type of application using the network.

Better efficiency is achieved by transmitting the packets according to the type of application transmitting it. Network Applications can be broadly classified as Throughput sensitive or Delay sensitive. Initially, the packets are classified into the type of application and then, every packet is transmitted to the destination using the Genetic algorithm, with the constraint that is imposed by the application type. By using this process, we can perform efficient transmission of packets in the network.