

Advanced Routing Algorithms in Dynamic Networks

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Abstract: To improve the performance of the network by implementing the best routing protocols. The purpose of routing algorithms is to make decisions for the router concerning the best path for data. Routing algorithms are to compute its decision's depends on routing protocol information. Routing protocols collect certain information about a variety of networks and routers from the surrounding environments. Every router has memory to store the information about the networks. In the paper we focus on to provide an efficient path, the routing scheme we propose that the combination of "Traditional link state routing algorithm" (LSA) and routing protocols. Its main objective is by using special packet we reduce the delay and bandwidth in between the neighboring routers.

Keywords: routing, routing protocols, link state routing algorithm and shortest path.

1. INTRODUCTION

Routing algorithm is the part of the network layer software responsibility is to decide that which output line on incoming packet should be transmitted on routing algorithm performance is estimated depends on the quality of service. Here address various routing algorithms like adaptive and non-adaptive. In non-adaptive the path is fixed there is no chance to distribute the traffic to its neighboring routers.

We preferred adaptive routing algorithms. Here easy distributed the load and best way to find the shortest path to its neighbors towards its destination. In existing methods every router maintains the information about all other routers in the network. it is the time delay process and require to huge buffer length and more time consumed to transmit the routing information to its neighbors. In this paper, there is no need to maintain all router information, the router only knows the information about its neighbors while transmission time. By implementing the routing algorithm with the help of routing algorithms.

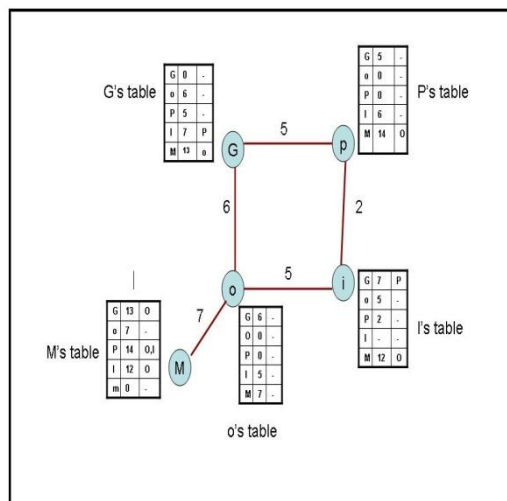
Source-code for to improve the link-state-routing-algorithm

```
#include<stdio.h>
main ()
{
    int n,a[10][10],d,e;
    printf ("ENTER THE NUMBER OF NODES");
    scanf ("%d",&n);
    printf ("ENTER THE MATRIX ELEMENTS: ");
    for (d=0;d<n;d++)
    printf ("n ENTER THE DISTANCE FOR THE NODE: %d \n",d+1);
    for (e=0;e<n;e++)
    {
        scanf ("%d",&a[d][e]);
    }
    for (d=0;d<n;d++)
    {
        printf ("n THE LINK STATE PACKETS FOR NODE:%d\n",d+1);
        printf ("n NODE:t DISTANCE \n");
        for (e=0;e<n;e++)
        {
            if (a[d][e]==0 && a[d][e]==-1)
            {
                printf ("%d t %d \n",e+1,a[d][e]);
            }
        }
        printf ("n \n");
    }
}
```

2. RELATED WORK

The role of the network layer is then deceptively simple i.e. to move packets from sending host to receiving host to do so, two important network layer functions can be identified **forwarding** and **routing**. In forward method, when a packet arrives at a routers input link the router must move the packet to the appropriate output link. In routing method, the network layer must determine the path taken by packets as they flow from a sender to a receiver. The algorithms that calculate these paths are referred to as routing algorithm.

We learned in this routing algorithm is we've mostly explored the network layers forwarding functions. We learned that when a packet arrives to a router. The router indexes a forwarding table and determines the link interface to which the packet is to be directed. The interplay between routing algorithm and forwarding table was shown in the figure.



Routing is the process of selecting the best path in a network in the past, the term routing was also used to mean forwarding network traffic among networks. Routing is performed for many kinds of networks including the telephone network (circuit, switching), electronic data networks and transportation networks. Routing are of two types **STATIC AND DYNAMIC ROUTING**. Static routing occurs at when you manually add routers in each routers routing table.

Command syntax for static routing:

```
ip route[destination_network][mask]
[Next_hop_address on exist_interface]
[administrative_distance][Permanent]
```

Ip route: the command used to create the static route.

Destination network: the network you are placing in the routing table.

Mask: the subnet mask being used on the network.

In the dynamic network for every second the routing table will be update dynamically.so,for every routing algorithm choose dynamic path from source to destination via intermediate routers. The best examples for dynamic are “*distance vector*” and “*link state routing algorithms*”. Distance vector routing algorithm suffers from count to infinity problem so we can choose best dynamic routing algorithm is link-state. In this paper we reduce number of steps to find shortest path from source to destination.

3. PROPOSED WORK

In the existing link state routing algorithm having five steps to get the shortest path in this paper we reduced instead of five to four steps .Those are

1. By using sample message discover its neighbors and their delay time.

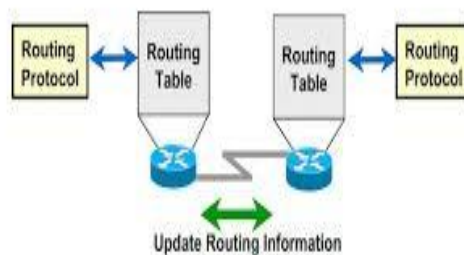
2. Build the packet for its neighbor's information.
3. Distribute the packets to all neighbors at once by using multicasting.
4. Calculate shortest path.

3.1 Discover its Neighbours and Find their Delay Time

Initially, the router sends "HELLO" and "ECHO" packet send simultaneously. Hello packet using for getting their network address. Echo packet find out there delay time. This process is continued until to get best average delay time. Within one step the router find out there network address and delay time and also bandwidth will be reduced.

3.2 Construction of Packet

After getting the information from its neighbours the router store their values in their buffers. This procedure is repeat until to receive best average time from its neighbours.

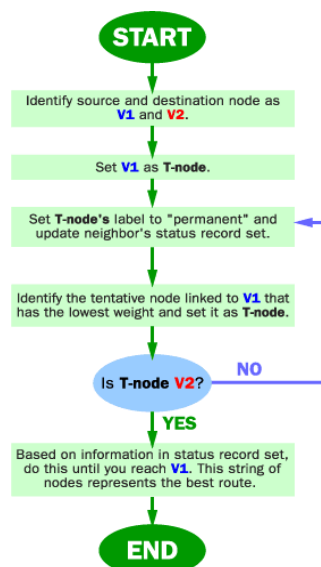


3.3 Packet Distribution

The router will multicast to all its information over the networks for other routers and receives. Thus all routers share their knowledge and their information to each other.

3.4 Compute Shortest Path

The router will compute the best route between two nodes of networks. Thus the best route for the packet to every node is chooses. In this way the shortest path algorithm is performed. Using IS-IS and OSPF routing protocols connect different region autonomous routers.



4. CONCLUSION

The network layer provides service to the transport layer it can be based on the either virtual circuits or datagrams. Many routing algorithms are used in computer networks. static include shortest path

routing and flooding. Dynamic algorithm includes distance vector and link state routing. Quality of service, quantity of service and speed are the three most important performance measures for any routing algorithm. Network can differ in various ways, so multiple networks are interconnected problems can occur sometimes the problems can be finessed by Tunneling a packet through a hostile network. But if the source and destination networks are different, this approach fails. When different networks have different maximum packet sizes, fragmentation may be called for.

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