**ECON 484 HOMEWORK-1**

We should use routing protocols to route intercity buses because routing protocols are used to communicate different networks. Routing protocols use two different methods, static and dynamic. Dynamic routing protocols are called distance vector and line state protocols. The main task of the router is to decipher the optimal path between the source and the target system. The main purpose of decoupling will be to find the most appropriate way between the two points according to the situation and transfer the packets over that way.

**Dynamic Routing Protocols**

**Distance Vector Protocols**

In these protocols, routes are determined depending on the distance and direction vectors. The distance is determined according to the number of stops passed; the direction is also determined according to the next stop or exit interface. Distance Vector Protocols use the Bellman-Ford algorithm to determine the best route. Distance vector protocols do not impose much load on the router's processor, since they use simple algorithms when choosing the best path.

**Line Status Protocols**

Routers working with these protocols can map the topology of the entire network thanks to the information they have learned from other routers. They collect all the subnets in a tree and make the most accurate decision about which way to go with the shortest path algorithm. Because packets are transferred to a neighboring router without any changes to it, the speed problem encountered in the distance vector protocols does not exist in these protocols.

**Non-Adaptive Routing Algorithm;**

Non-Adaptive Algorithms, In this algorithm, the incoming data packet is sent back to all other nodes except the node from which the packet came. With this method, packets are constantly circulating in the network. Because they do not make routing decisions based on network topology and traffic, routing information is already present in the router when the network is started. That is why it is also known as the Static Routing Algorithm.

**Hierarchical Routing ;**

As the network grows, the Routers also grow, so the Routing Tables will also multiply and use more resources (Ram, Processor), the cost will increase. In order to avoid this, a Hierarchical routing algorithm is used. A specific zone is determined for which each router is responsible, and the router itself routes to the subnets in the zone for which it is responsible.

## **Shortest Path Routing;**

A Fixed algorithm that works on the dec that the path between the source system and the target system is the shortest in a network. In this algorithm, the Distance between routers can be selected as a Metric, as well as measurement criteria such as the Number of Tabs between Routers (Hop), Average Dec Deceleration, Average Traffic Load, Communication Cost, Average Queue length and other metrics. If the chosen metric is Cost, the Algorithm obtains the Least Costly paths. In other words, the definition of the shortest path takes into account not only the dec decency of the distance between the nodes, but also the Number of Tabs and the Economic Cost of the path between the nodes.

**Adaptive Routing Algorithms ;**

**Distance Vector Routing (Distance Vector Routing);**

In the Distance Vector Algorithm, there is a path information indicating the route and the average distance and time of departure for the destination address at all nodes. In this algorithm, each node creates routing tables that show the distance (or delay) of the best path that should be used to access other nodes. These tables are called "Vectors". And with the exchange of information between nodes, the table is constantly updated. Each node decalculates according to various metrics to find the distance between itself and the neighboring nodes.

## **Link State Routing** **;**

The purpose of this Algorithm is to adapt easily to changes in the Topology, to find alternative ways when necessary according to changes in traffic.