

PA3 REPORT

I stored the tables in the arrays of structs from lines 31 to line 51 in the code. The three tables are namely the `all_server_table` which contains the information about all the servers which we receive from the topology file, routing table which involves the path costs from a server to all the servers in the network, neighbour table involves the information about all the neighbours of a particular server and their routing table which will be used while applying the Bellman-Ford Algorithm. The update message is formed from line 249 till 320 in the code.

As it is UDP I used a socket for sending the Packet between the servers which is mentioned on the line 189 of the code. The Packet to be sent was made as follows :

1. For all the 16 bit entities short was used
2. For encompassing IP I divided each part of the IP into an ASCII character.
Eg : consider 97.97.97.97 can be translated to four characters of A.

For the Timer I created a vector which stored all the neighbour's values as well as the last entry was for self node. I find the minimum value in the vector and set it as the next timeout and if a packet is received during that time the timer vector is adjusted accordingly by subtracting the elapsed time from every entry.

The select statement's last parameter i.e `timeval` is used for the timeouts. We have one STDIN file descriptor, one listening socket which also reads data sent by other server. For updating the entire routing table I created a function `routing_update` which is at 445th line in the code and it calculates the routing table using the Bellman-Ford Algorithm.

Whenever we receive a packet we initialize the timeout of the neighbour to three times the timeout interval and thus during the timeout of this node we know that the update has not been sent for three time intervals and set the cost to INF which is `INT_MAX` in my code. It still can send the messages and receive the messages from that neighbour.

I have maintained a `is_disabled` state for a neighbour such that the node which is disabled has this value as one and thus we know that the packets should not be sent to this node and the packets coming from this node should be dropped which is displayed by "MESSAGE DISCARDED " message in the code.

The function used to send periodic updates to the neighbours is given by `send_periodic_updates` in my code at line 212 in my code and this is also used in the STEP command given. The distance_vector packets received is shown by the variable declared at the line 29 in my code and it denotes all the packets received from the non disabled nodes. The algorithm function is the Bellman-Ford Algorithm at line 98 which carries out the calculation of the routing table.

