CSE 589 Modern Networking Concepts (Fall 2016)

Project 2: Routing Protocols Report

Prepared by
Name: Anurag Devulapalli
UBIT Name: ANURAGDE

Code Documentation:

1. Methods used in the Program:

S No	Method Name	Purpose	~Line no.
1	main()	Reads the command line arguments and invokes initializeVariables(),setTimer(),displayRoutingTable(),serverStart() methods	544
2	initializeVariables()	Reads the topology file and inputs the initialises the corresponding variables.	331
3	setTimer()	Initializes the timer required to constantly send distance vector updates to the neighbors and constanly check if neighbors are alive. It calls the timerMethods() .	525
4	timerMethods()	It calls the incrementCounter(); stepRoutingTable(); methods	206
5	StepRoutingTable()	It sends the distance vectors to the neighbors on a regular basis or when ever user requests for “-step”	182
6	createMessage()	Creates the message to be sent in the required format.	152
7	displayRoutingTable()	Used to display the routing table whenever invoked by user.	288
8	counter()	Resets the counter of neighbor to 1.	231
9	serverStart()	It is used to receive inputs/data from user commands or other servers.	485
10	startServer()	It is used to register the socket which is called by serverStart().	453
11	handleUserInput()	It is used to perform user requested actions like display, step,update	396
12	applyBellmanFordAlgorithm()	Applies the bellman ford algorithm when received distance vector updates from neighbors.	238
13	getneighbourDetails()	Reads the received message and populates the neighbor fields.	474
14	stepRoutingTable1()	It sends the updated link to the node between which the link was updated	212
15	updateRoutingTable()	Used to update the link of the server as requested by the user.	304
16	recomputeCostMatrix()	Whenever a link is updated by the user, this is invoked to recompute the distance vectors.	68
17	disableServer()	Disables the link to the requested server.	316

18	incrementCounter()	It increments the counter for each neighbor on a regular basis.	110
19	getIndex()	Used to get the index of the server id in the array.	57

2. Data structures of update message and routing table:

Update Message: /*Update Message Format*/
Update Message (messagetoSend) is defined as a struct (messageFormat) in the program and is defined at line number 122 and initialised in createMethod() at 151.

Routing Table: /*routing table format*/
Routing table which is a 2-D array `selfRoutingTable.`minCost[][],is defined in a struct called routingTable which is defined at line number 41.

Implementation Details

The project aims to implement the distance vector algorithm to compute the shortest path to the nodes present in the network.

The topology file and the update interval are given to the program at startup, the server reads and estimates the initial distance vectors to its neighbors.

Now, the server waits

- until the timeout occurs
  - Here, the server sends the distance vector message to the neighbor nodes
- receives message from neighbor
  - If the message is a routing message, the server recomputes the routing table using “bellman ford algorithm” and resets the counter of the neighbor.
  - If the message due to an update from the neighbor, the server updates its link to neighbor and recomputes distance vector. Here the counter of the neighbor is not reset.
- user inputs a command
  - **update** – update the link cost as per user instruction and recomputes the distance vectors and notifies the affected neighbor.
  - **Step** – Server sends the distance vector to its neighbors
  - **packets** – It displays the number of distance vector packets this server has received since the last instance when this information was requested.
    The information displayed in the actual program is changed (by deleting 72 bytes from the answer) to meet the requirement.
  - **Disable** – Disables the link to the given node, the node can no longer send/receive updates to this server.
  - **Crash** – exits the program on the system.

Assumptions:

1. The input file must have 5 servers and sorted by server id ,although the program works if the program is implemented in less than 5 servers.