Project Report

Computer Networks (Link State Routing Protocol)

Group Members: Waqas Javed(33784), Sadia Younis(34758)

# Introduction

The propose of this project was to implement and stimulate the Link State Routing Protocol and find the shortest path from a router to Any router in the Network. The project was done in python.

# Approach

We have used functional approach where each functionality is implemented using a separate function.

The project is divided into 4 parts.

1. Initialization
2. State of Neighbors
3. Broadcasting(Flooding)
4. Dijkstra’s

## Initialization

Initialization includes

1. Creating socket
2. Socket Binding
3. Reading File
4. Storing File data in Variables

There are 3 global tables.

1. Stores state of neighbor routers
2. Stores Broadcasting Packets
3. Stores the time of Broadcasting Packets

## Communication

A router can send and handle 3 types of packets the packet content may contain different data separated by **“?”** depending on packet type. The router recognizes the packet by seeing the 1st part of packet before **“?”** the value of which may be 1,2 or 3

1. Means a signal generated by some router to check if a router is alive. The router make reply to the sender.
2. Means a response generated by some router to tell that the router is alive and in working condition.
3. Means that this is a broadcast packet.

## State of Neighbors

The state of neighbors is saved in a dictionary where Boolean variable indicate router is on or off.

There is a thread which keeps on running and send neighbors a packet to ask are they alive by sending code 0.

There is receiving thread which when receives code 0 replies by code 1 to indicate it is working.

There is another there which keeps on running and checks if any router reply is not made by 3 sec declare it as off.

## Broadcasting

A thread keeps on sending message containing information of active neighbors with message code 2.

Message code 2 is handled by replacing the message in graph if it is a new message discarded if source of message is same. The packet is retransmitted if same packet has not been broadcasted before based on sequence number.

Each time a new broadcast message is received its time is noted the same router must broadcast it state within 3 sec otherwise the router will be considered as dead and entry will be deleted from Graph.

## Dijkstra’s

Dijkstra’s is implemented using help from internet

Source Url: <http://code.activestate.com/recipes/119466-dijkstras-algorithm-for-shortest-paths/>