Programming Assignment 3
Routing Protocols

1 Objectives

- To get better understanding of routing protocols.
- To get familiar with the NS3 simulator which is a very powerful research tool used to simulate networks [2].

2 Introduction

Open Shortest Path First (OSPF) [1] is a link state routing protocol. It is designed to be run internal to a single network. Each OSPF router maintains an identical database describing the network's topology.

3 Requirements

- Download NS3, build it and run the hello world example.
- Create a script that simulates the following topology, with those nodes having point to points links, and internet stack installed.

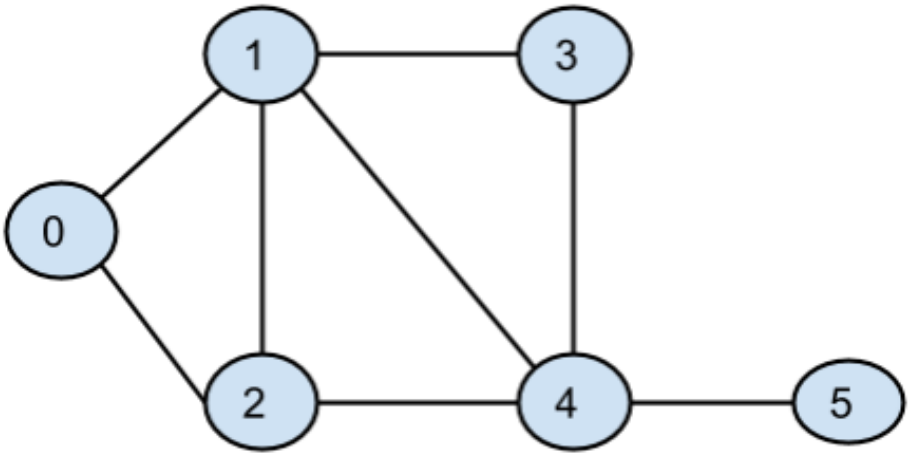

Figure 1: Network topology.

- When the internet stack gets installed, it is automatically has OSPF (named GlobalRouting in NS3) deployed to the nodes.

- Get the nodes to build their routing tables and update the NS3 source code to print host routes.
- When computing the routes, the GlobalRouting implementation in NS3 keeps all routes to the node in the database. You are required to update this part to filter the routes keeping only the route with the min number of hops (least cost).

4 Deliverables

- NS3 source code updated.
- A report that includes:
  - A description of the contribution introduced to code.
  - Sample test runs to illustrate the printed routing tables, and the routes taken by transferring packets between nodes

4.1 Reference

1. Open Shortest Path First (OSPF) Routing,
`http://www.ietf.org/rfc/rfc2328.txt`
2. NS3 simulator tutorial,
`https://www.nsnam.org/docs/release/3.18/tutorial%C2%ADpt%C2%ADbr/ns%C2%AD3%C2%ADtutorial.pdf`

Good Luck