

Computer Networks

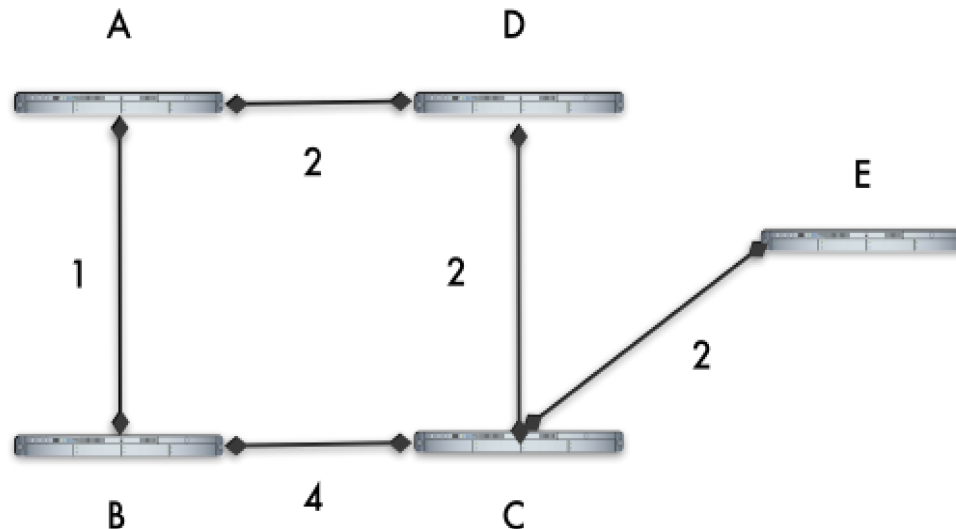
Programming Assignment No 2

Introduction

- In this programming assignment, you will implement the Bellman Ford routing algorithm over a distributed system. The algorithm will operate using a set of distributed client processes. Clients are identified by an $\langle \text{IP address, Port} \rangle$ tuple. Also, each client maintains a routing table which records the weight of the path between itself and the other clients in the network.

Routing part

- In the routing part, you will focus on building the routing table. Your program should support some commands for changing the network configuration dynamically.



Routing part

- LINKDOWN {ip_address port } – This allows the user to destroy an existing
- LINKUP {ip_address port weight}. This allows the user to restore the link to the mentioned neighbor to the given weight after it was destroyed by a LINKDOWN.
- SHOWRT – This allows the user to view the current routing table of the client. ie. It should indicate for each other client in the network, the cost and neighbor used to reach that client.

Routing part

- Each client wait on its sockets until its distance vector changes or until TIMEOUT seconds pass, whichever arrives sooner, and then transmit their distance vectors to all neighbors.
- Link failures is also assumed when a client doesn't receive a ROUTE UPDATE message from a neighbor (i.e., hasn't 'heard' from a neighbor) for $3 * \text{TIMEOUT}$ seconds.

Routing part

- Poison Reverse
- You should implement Poison Reverse in your routing algorithm, which means if client A go through client B to get access to C, in the distance vector A sends to B, the cost AC is infinity.

Clarification for Routing part

- 1. The LINKDOWN & LINKUP commands are symmetric, which means the DOWN/UP node has to send DV to certain node.
- 2. The graph is undirected so that when the routing table converge, the cost are symmetric.
- 3. LINKUP {ip_address port weight}. This allows the user to restore a link to the mentioned neighbor with the given weight after it was destroyed by a LINKDOWN.

File transmission

- A distributed file transfer, done after the network is converged.
- Send two portions of a file from two nodes in the network to third node in the network.
- Use the routing table to send this information.