Group Project

- Grouping: 8 students per group
- Task-1: Information exchange
  - basic requirements
    - Build a server (S) and several clients (C);
    - Each C can connect to S and other clients;
    - Each C can obtain the information on others clients via S, e.g., who is online, what IP used, …
    - S supports group chat room, i.e., each C is able to chat with other client through S's group chat room. (send and receive text message)
    - P2P chat: C selects from online user(s), and connect to it(them), send/receive messages

- **Optional work**
  - **Support Image transfer.**
  - **Audio, Video chat.**
  - **Provide web server, for browser supported information query, or chat? (Chapter 2)**
  - **Support offline mail system (Chapter 2)**
  - **UDP Pinger (Chapter 2)**
  - **proxy Cache (Chapter 2)**
  - **Pass through LAN**
  - **Implementing a Reliable Transport Protocol (Chapter 3)**
  - **Implementing a Distributed, Asynchronous Distance Vector Routing Algorithm (Chapter 4)**
  - **Streaming Video with RTSP and RTP (Chapter 7)**
  - **…**

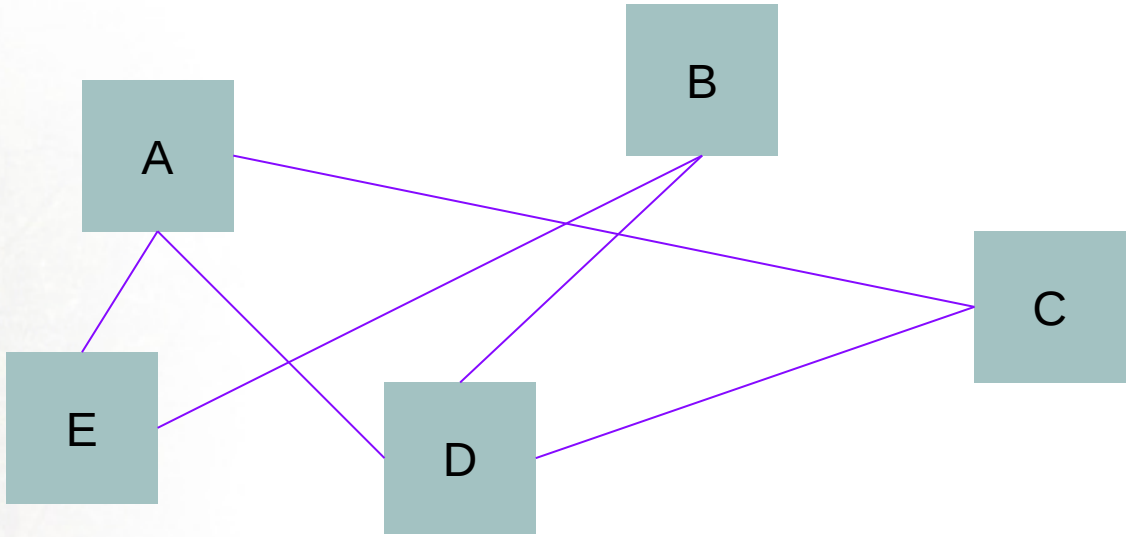
- **Task-2: virtual routing (Application-layer routing)**
  - **self-organized routing**
    - **Select a virtual topo for members' computers**
    - **Build virtual connection between computers according to the virtual topo;**
    - **Each computer acts as both client and router.**
    - **Each computer exchanges and updates routing table periodically.**
    - **A computer can send message to other computers,**

Hint:

- **IP-in-IP (IP-layer virtual routing) or**
- **use sock directly (Application-layer routing)**

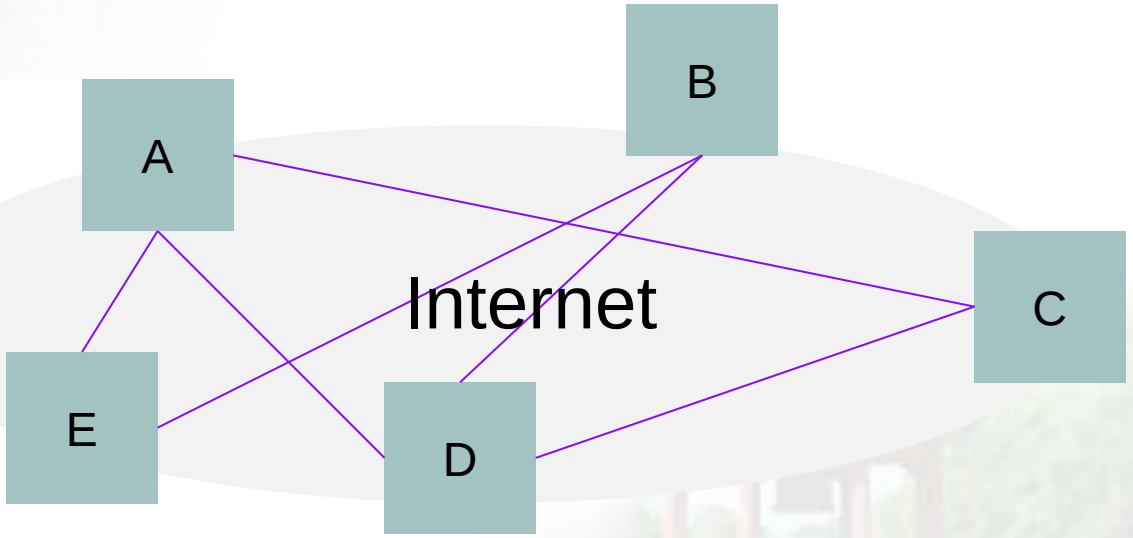
Step 1:

Design the virtual topo (link cost)



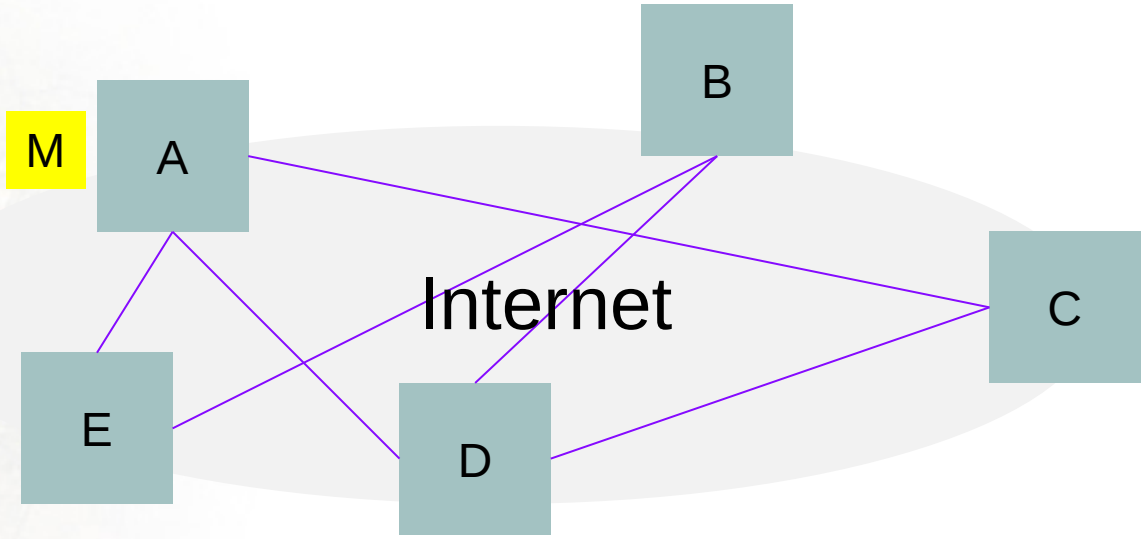
Step 2:

Build the virtual Topo over Internet & exchange the routing information periodically



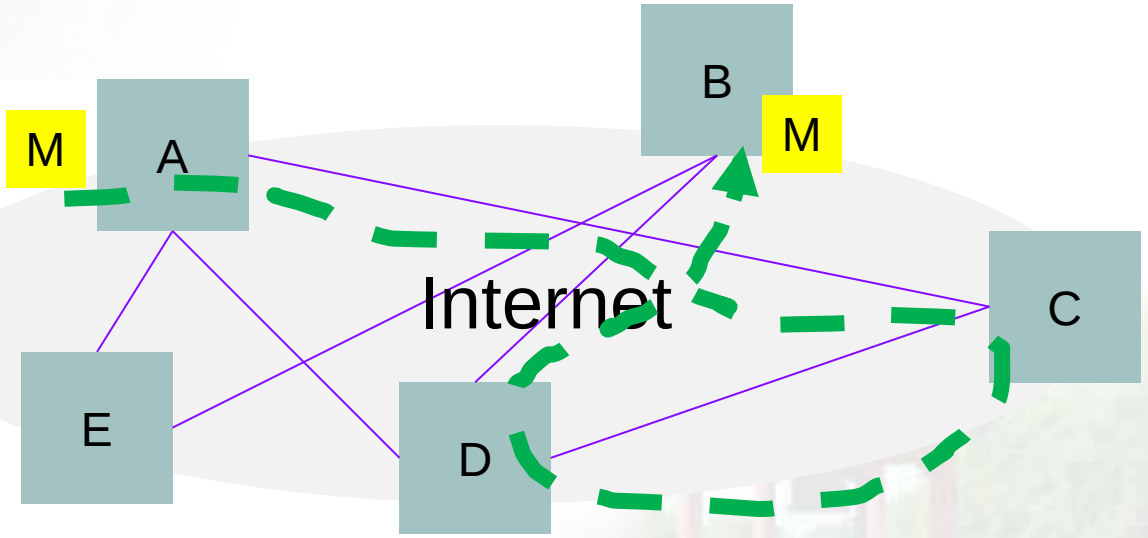
Step 3:

Simulate the routing and forwarding. For example, A sends M to B. Which path is better?
A →E → B? or
A →D → B?
A → C → D → B?



Step 4:

Transmit data M via the best path, e.g.,
A → C → D → B



Please try different topos and different routing algorithms (LS & DV).

- **Task-2: virtual routing**
  - **centralized routing**
    - **Like the above self-organized routing**
    - **Controller determines and distributes routing policy (routing table) to each member**

Example: A sends M to B. Which path is better? A →E → B? or A → C → D → B?