CSE 322: Computer Networks Sessional (NS3)

Using Minimum Spanning Tree in Dynamic Routing

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Motivation

To find the shortest path

- Link State Routing
  - Uses “Dijkstra’s Algorithm”
- Distance Vector Routing
  - Uses “Bellman Ford Algorithm”

Motivation

Shortest Path Algorithms

- **Dijkstra's** - O(V+ElogV)
- **Bellman Ford** - O(V.E)

- Floyd Warshall's - O(V^3)

Motivation

End Goal

- Connect nodes to each other w/ minimal cost

Idea

Proposal

- Use **Minimum Spanning Tree** to build the routing table
- Edge weight: **Packet Delivery Time/Hop Count**

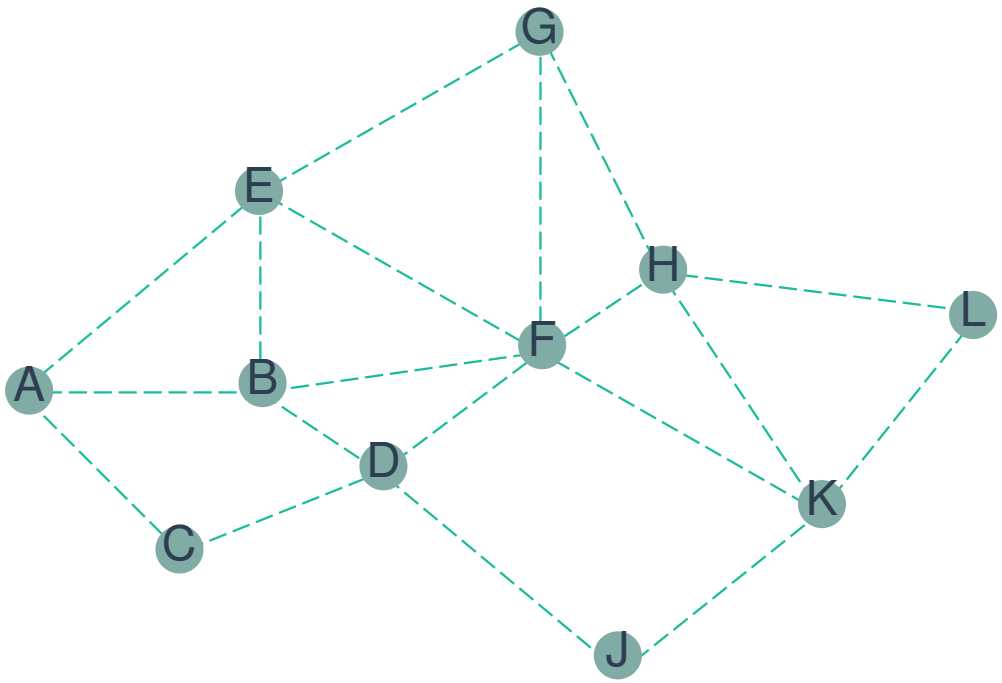
Algorithms

- Prim's: `O(V^2)` or `O(ElogV)`
- Kruskal: `O(ElogV)`

Idea

Network

- Nodes: 11

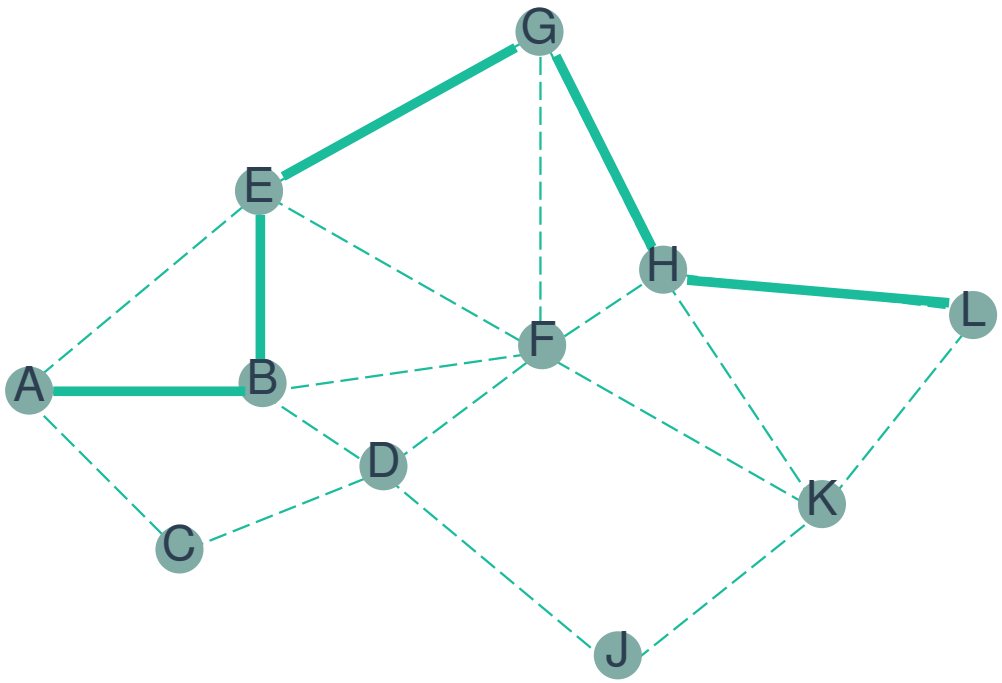


Idea

Network

- Nodes: 11

A → L

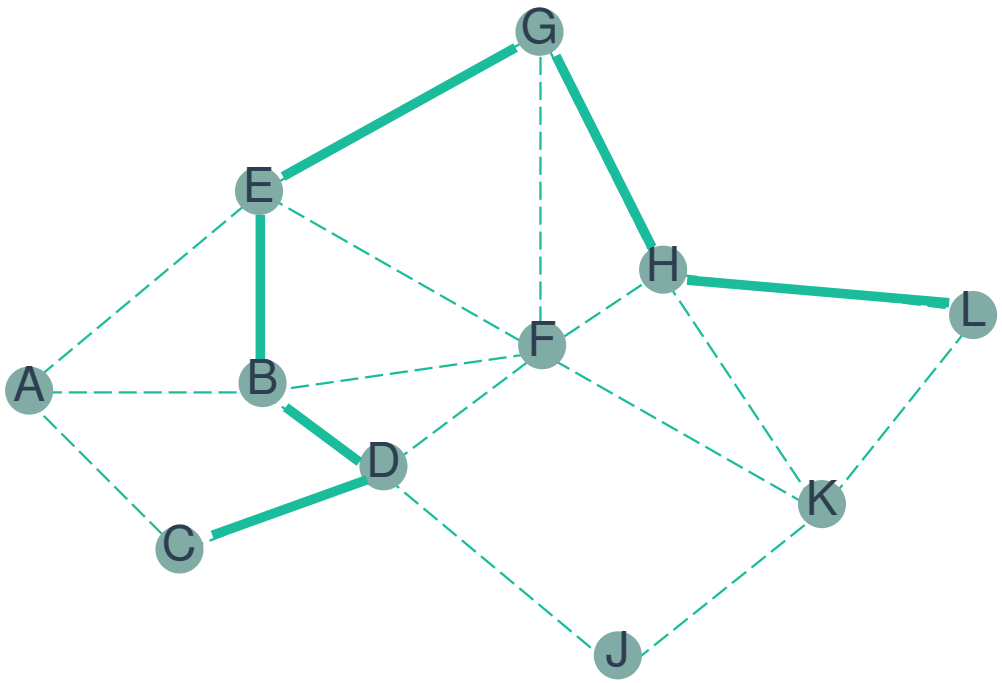


Idea

Network

- Nodes: 11

C → L

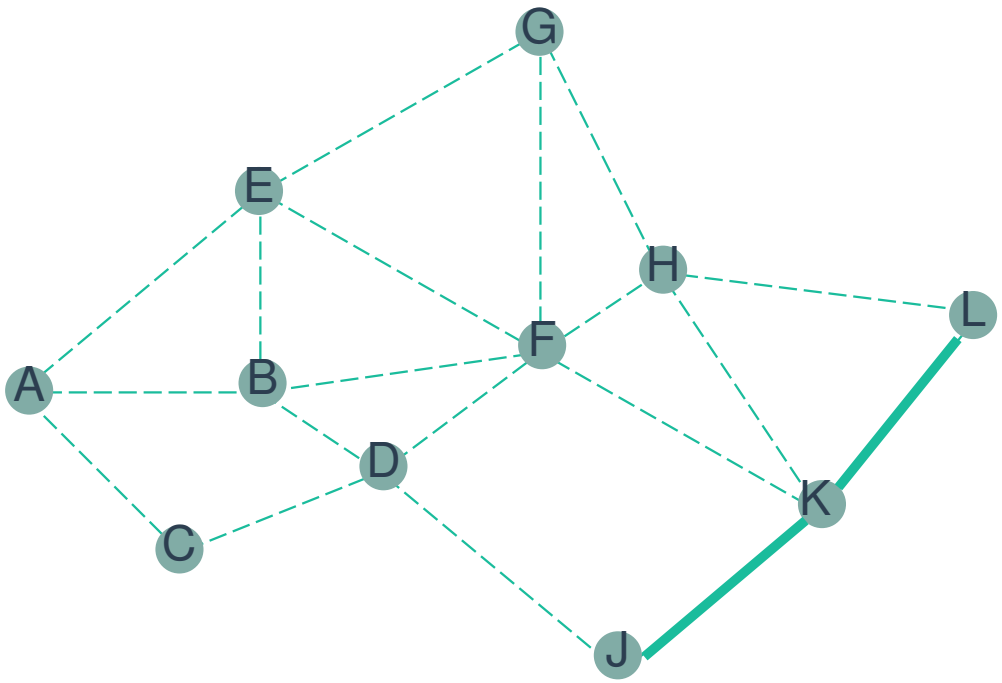


Idea

Network

- Nodes: 11

J → L

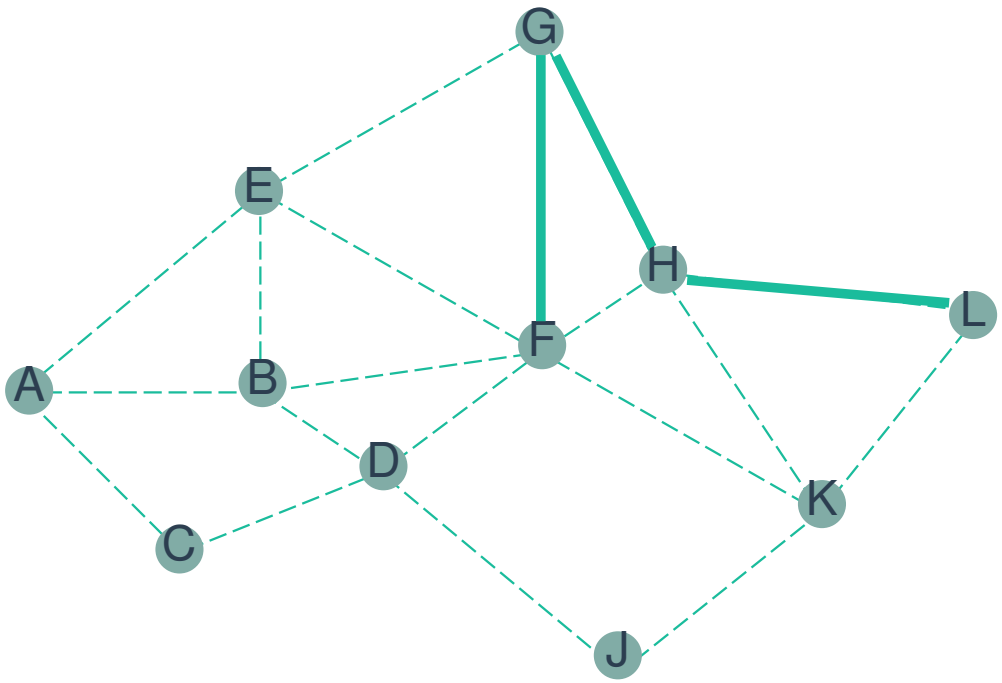


Idea

Network

- Nodes: 11

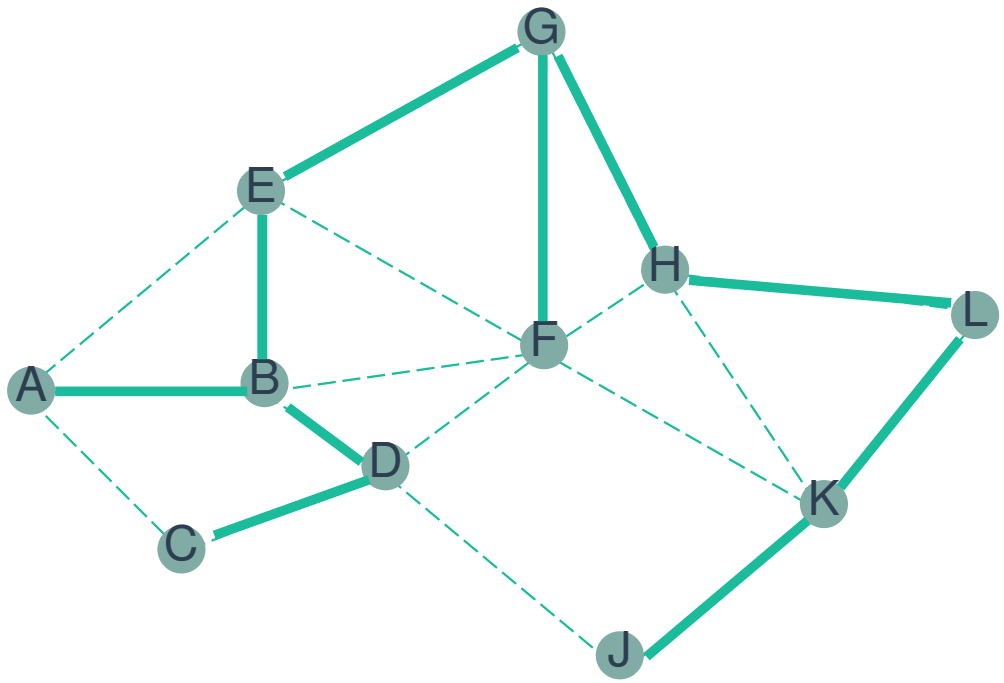
F → L



Idea

Connect all paths

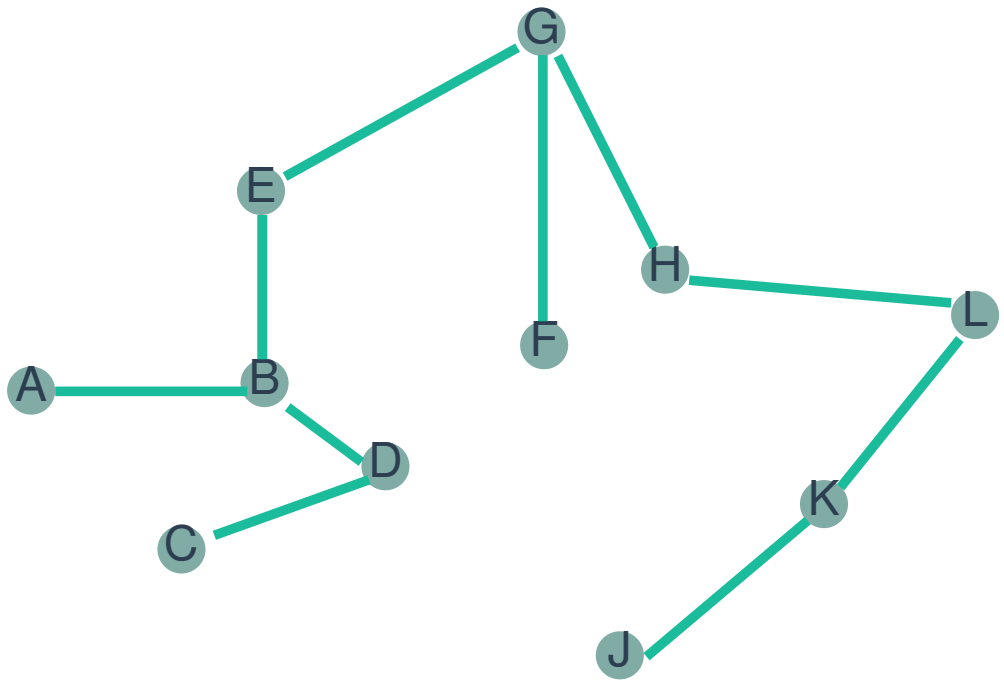
- A **Minimum Spanning Tree** is created.
- **Minimal path**, unless edge weight changes.



Experimental

- Share the **MST** among other nodes

  (for saving computation resources)



Thank You