

oueees-202106 topic 07:

# Routing in details

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On the internet

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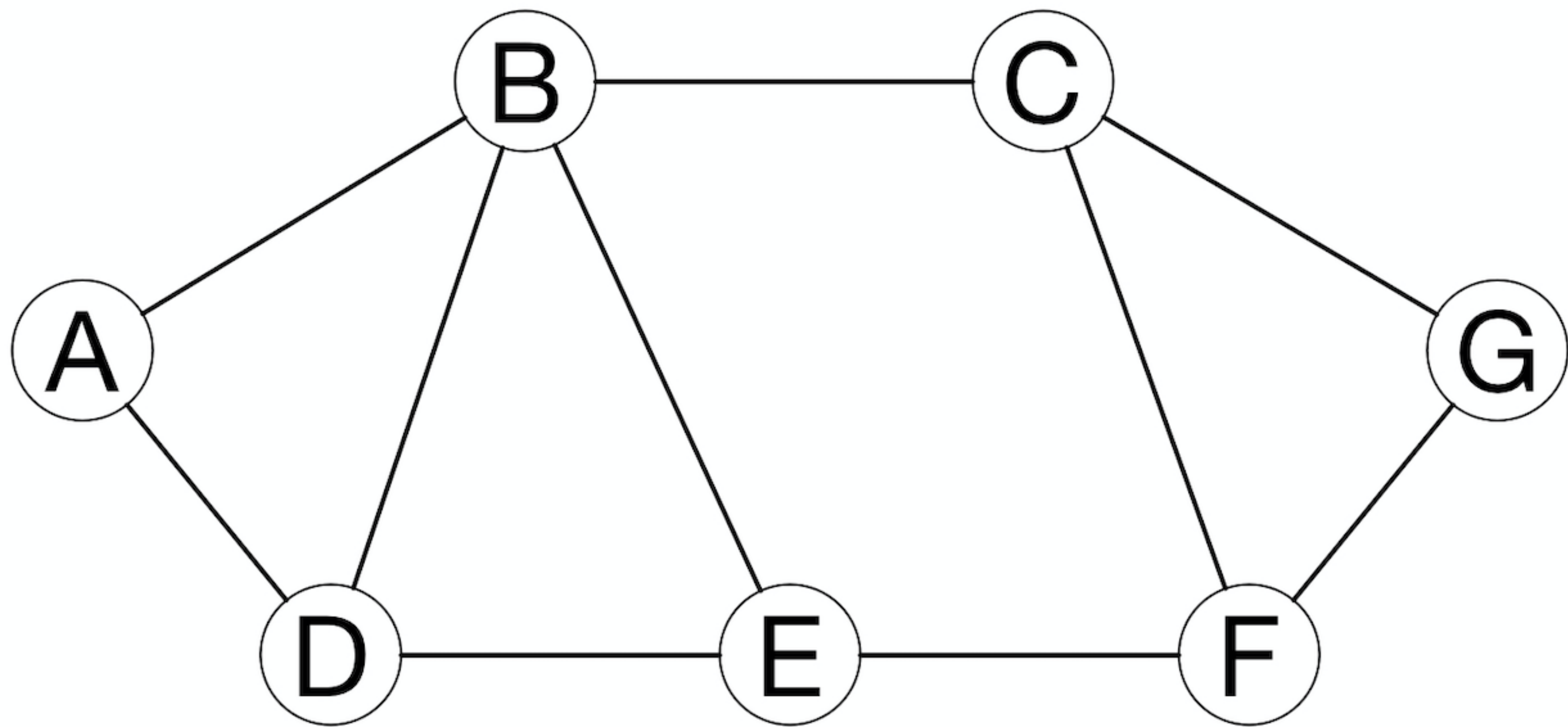
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# Lecture notes and reporting

- <https://github.com/jj1bdx/oueees-202106-public/>
- Check out the README.md file and the issues!
- Keyword at the end of the talk
- URL for submitting the report at the end of the talk

Topic of this video:

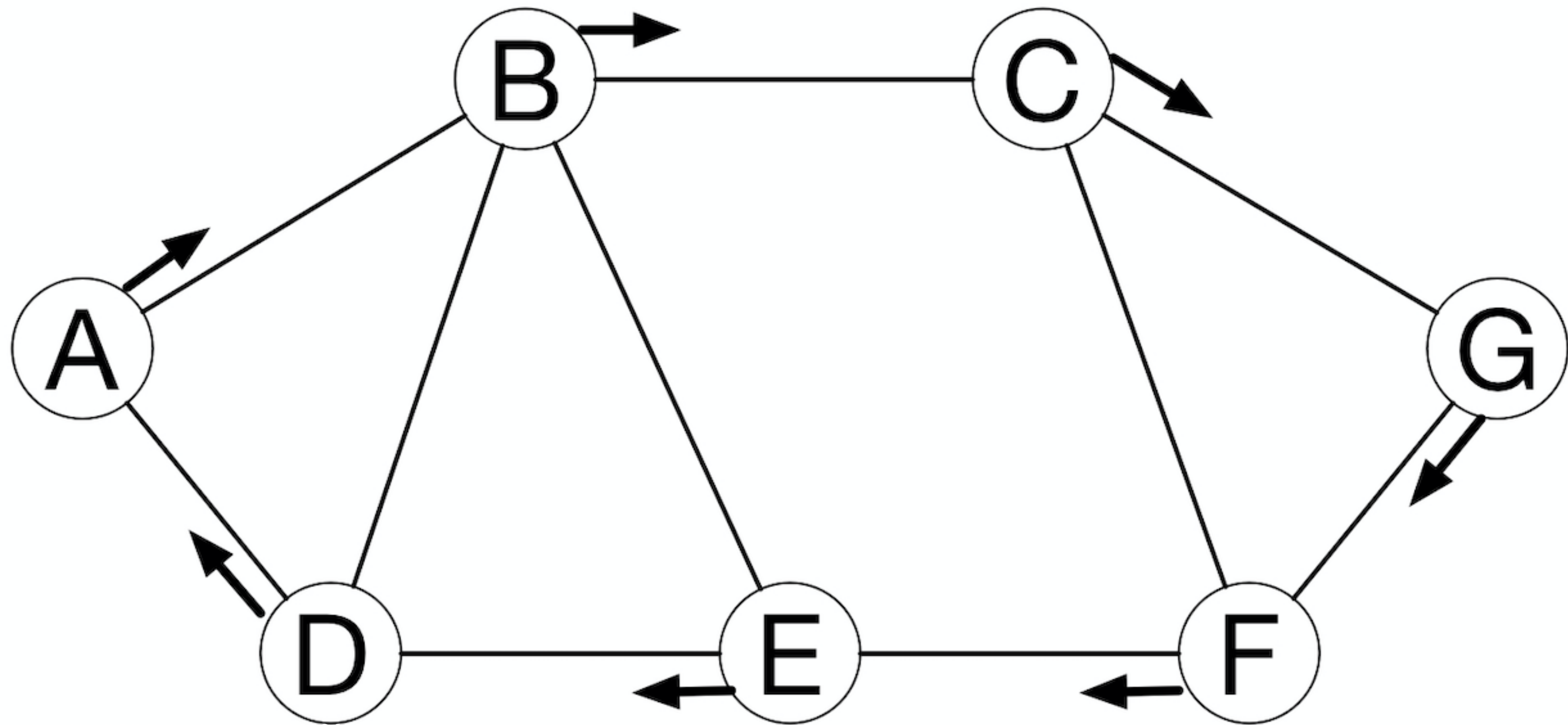
# Routing in details



# Static routing

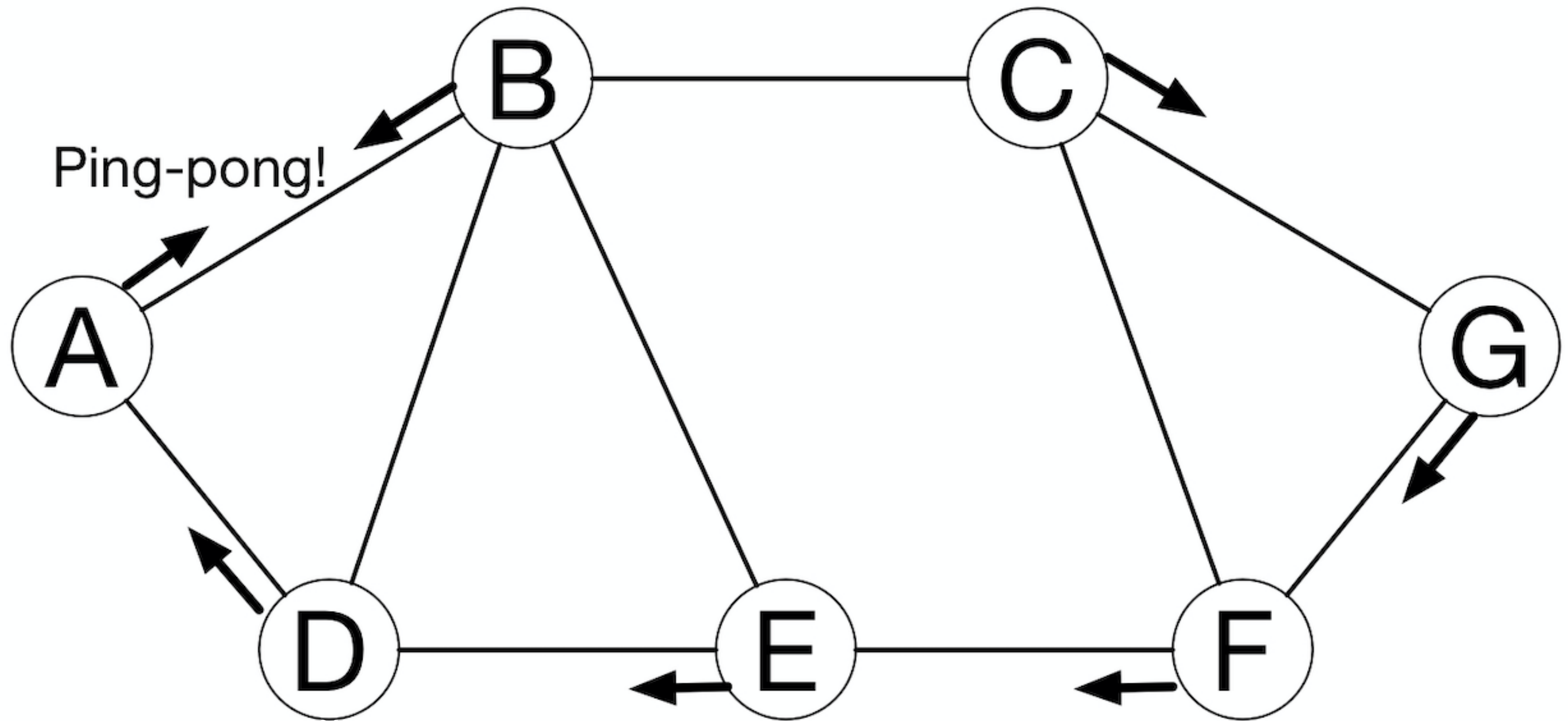
- Set the default route for nodes which are not directly reachable
- Works well on simple networks or star networks
- Static routing may cause *ping-pong*

→ Default static route





→ Default static route

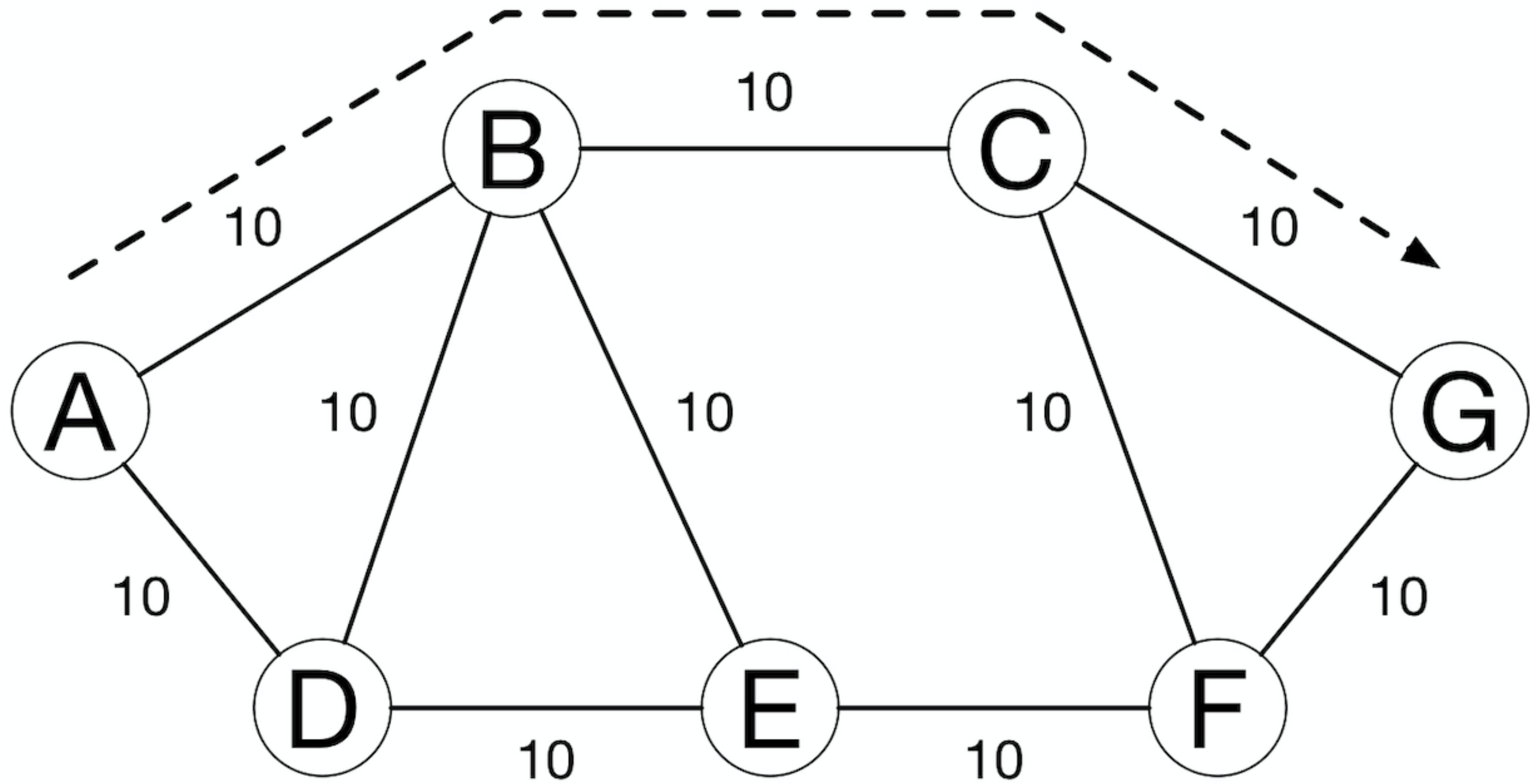


# Dynamic routing

- Hop count: count the hops between nodes
- Link cost: determined by the speed and quality
- Administrative policies

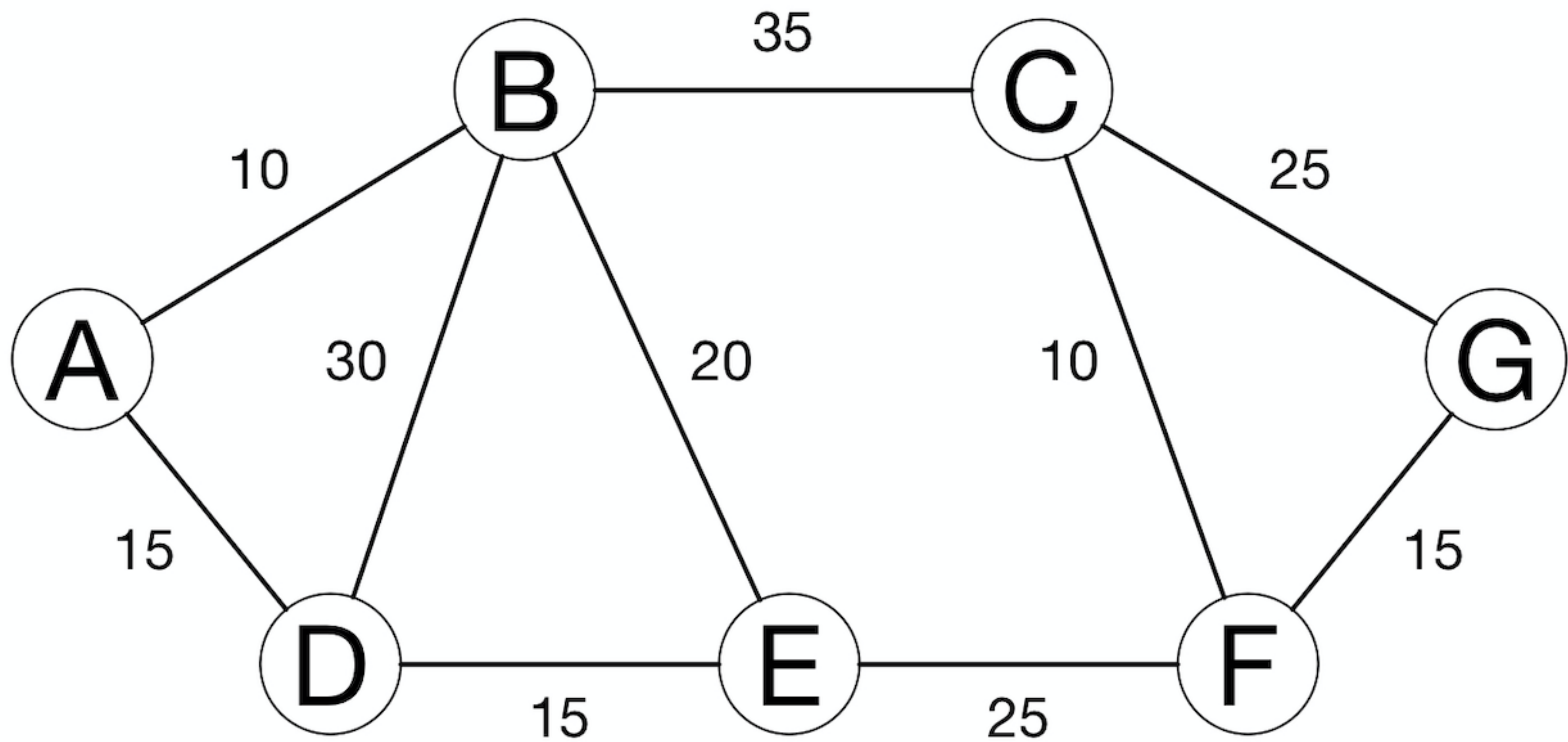
# Simple hop counting

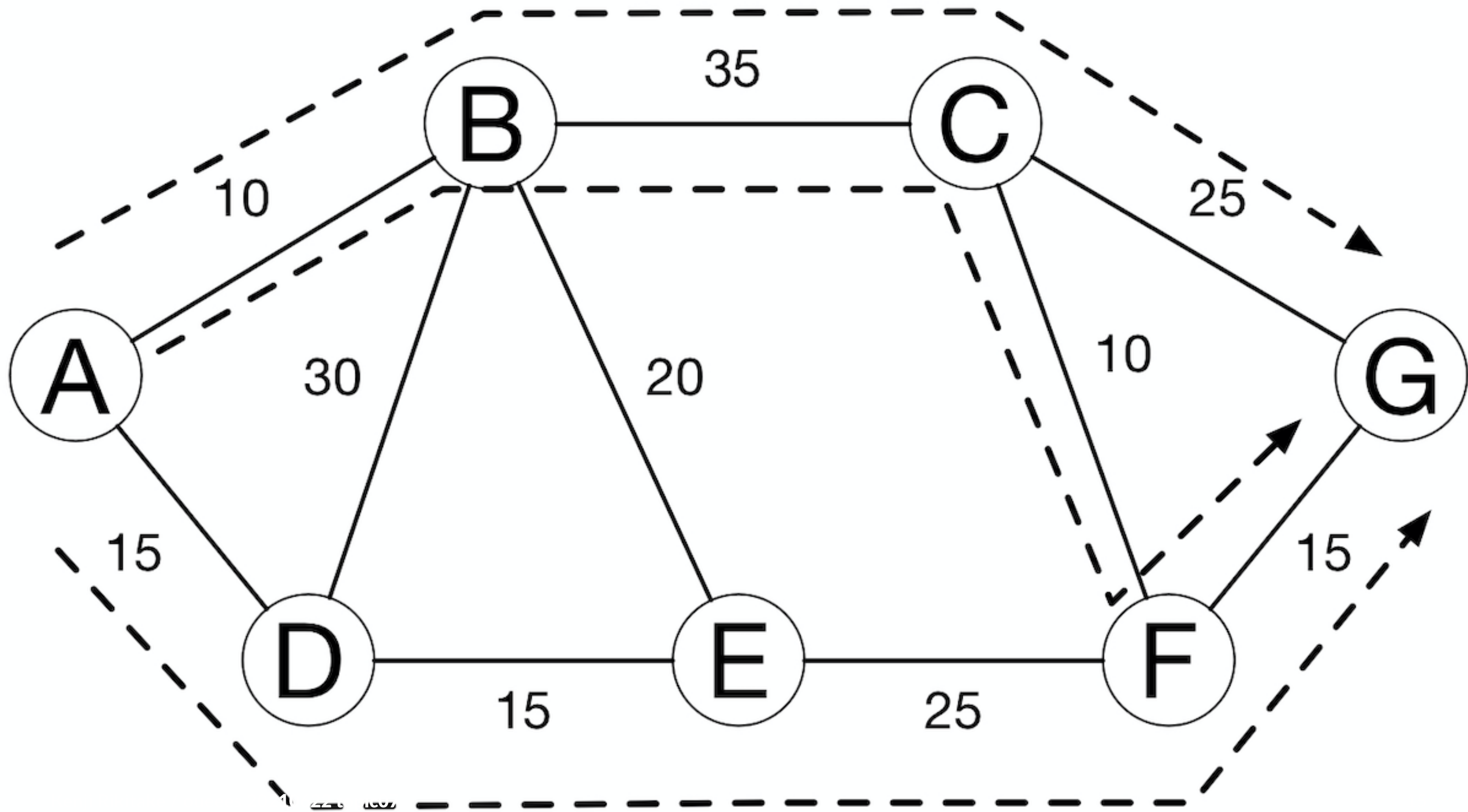
- Assume every link costs the same with each other



# Evaluating link cost

- What if the cost of each link varies?
- If two or more paths have the equal cost, all of the links will be utilized for load balancing

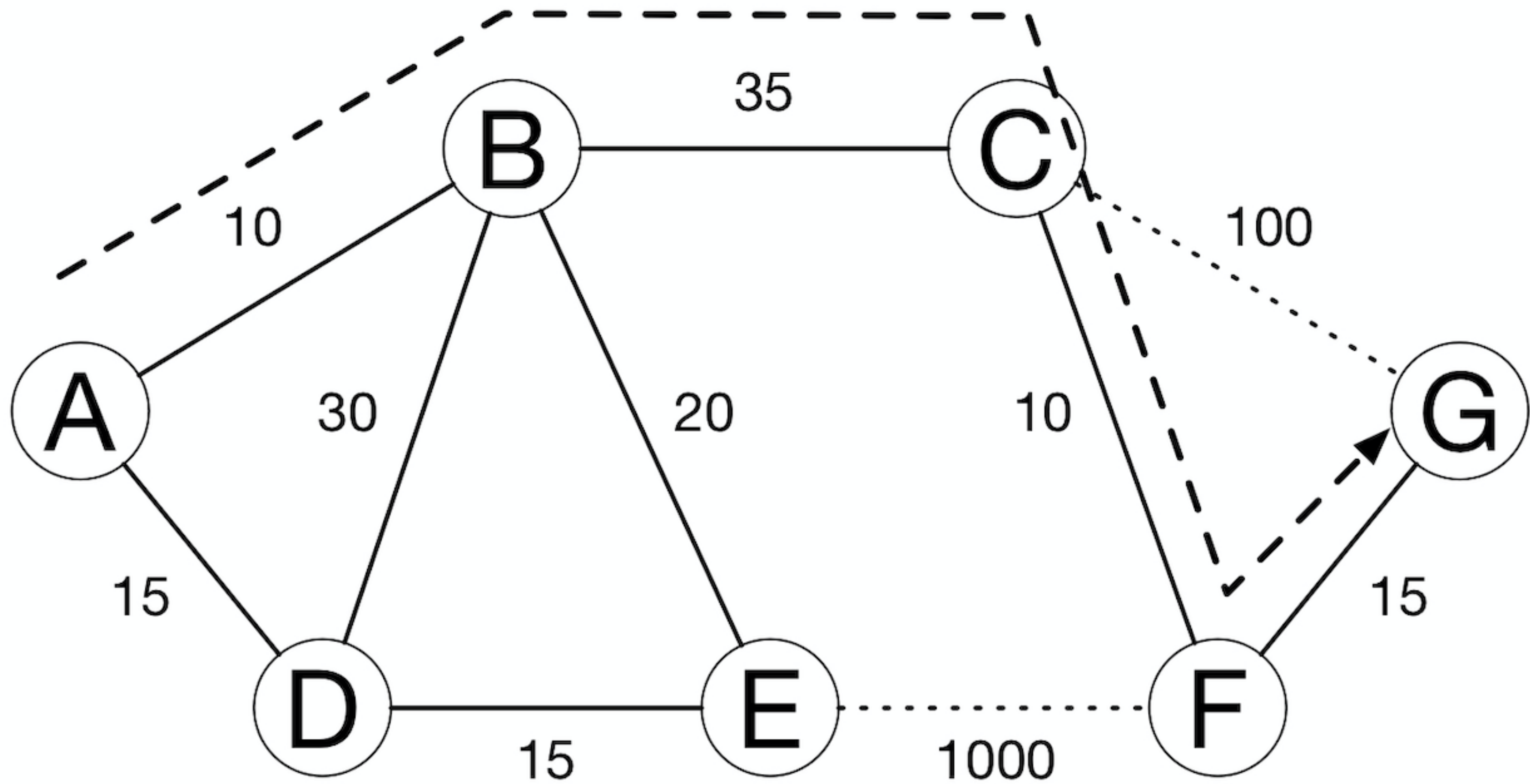




# Simulating link failures

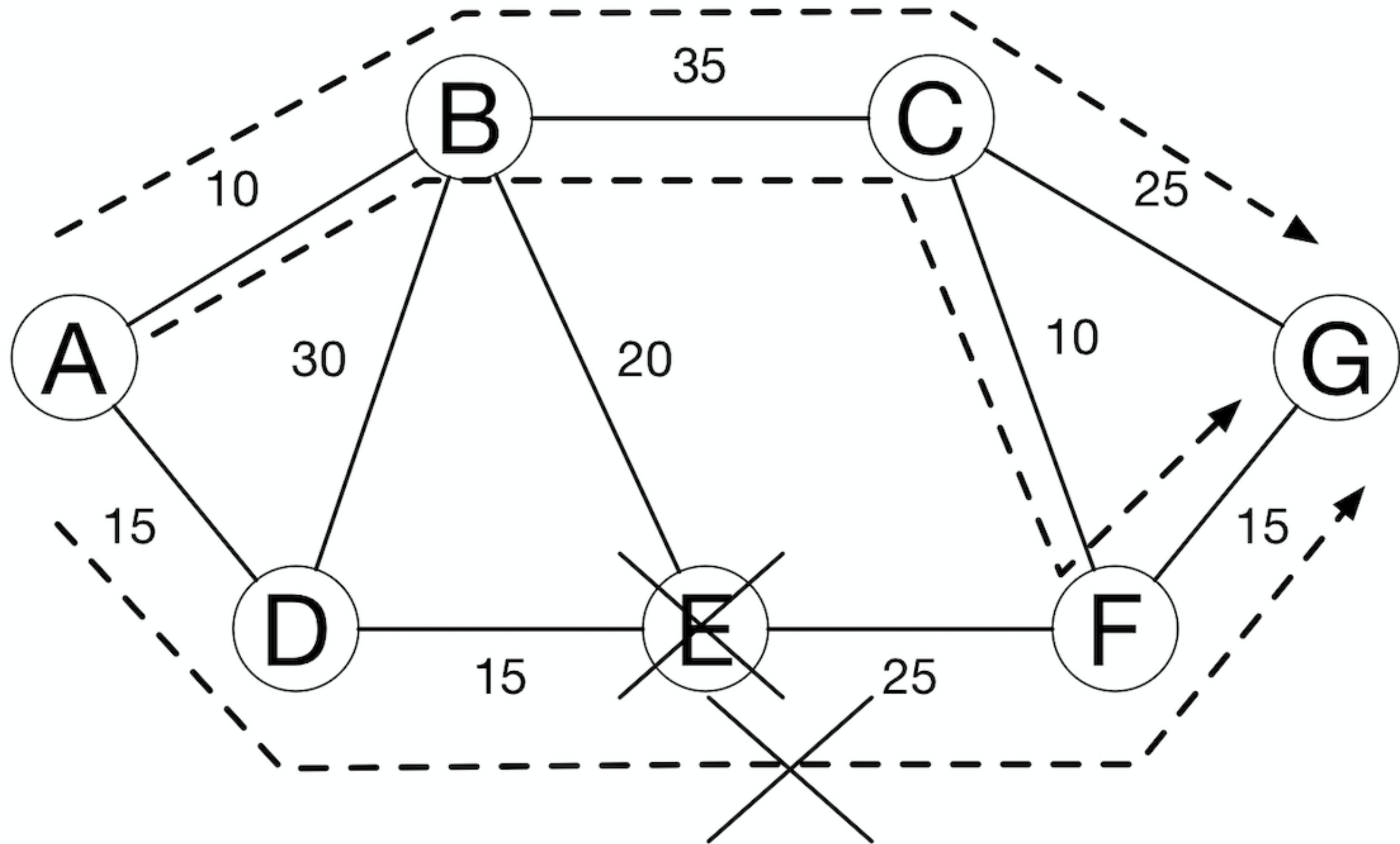
- What if the link suddenly degrades or is disconnected?
- Largely increasing the cost of degraded or disconnected links will give an easy solution





# Administrative policies

- For many reasons, you don't want to accept packets from some nodes, depending on the relay paths
- For example: passing C is OK, but passing E is not: A-B-C-G and A-B-C-F-G are OK, but A-D-E-F-G is blocked
- Common among interconnection of the autonomous systems (internet service providers and organizations)



# Routing information dissemination protocols

- Link-state protocol: flooding link cost information of each node throughout the network
- Path vector protocol: exchanging path of nodes for each network instead of the link costs
- Highly vulnerable to external attacks

# Routing aggregation

- The following four networks
  - 192.168.100.0/24
  - 192.168.101.0/24
  - 192.168.102.0/24
  - 192.168.103.0/24
- -> aggregated as 192.168.100.0/22
- 4 networks together as one aggregated network

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