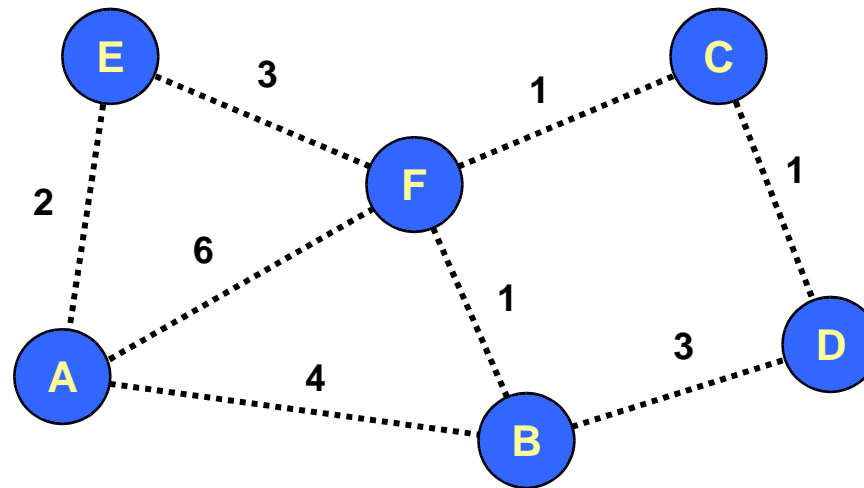


The routing table

- Each node in the network has one or more interfaces with associated costs. The routing table tells IP packets which interface to use, based on the destination address.

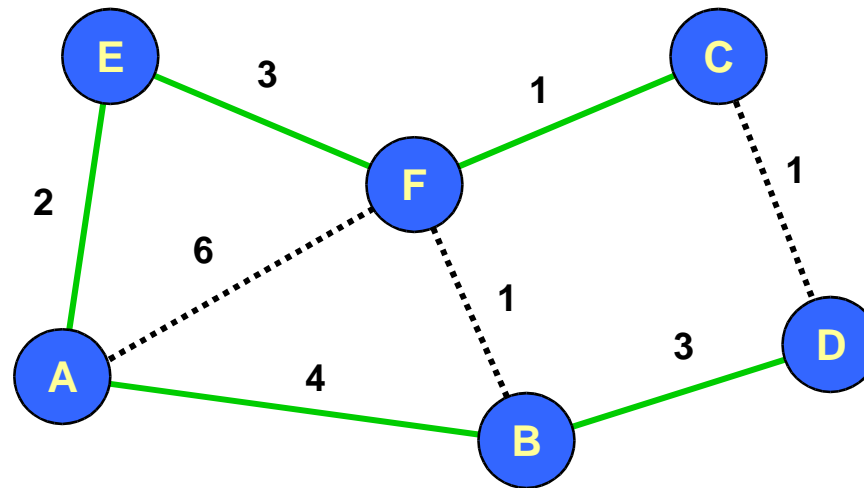


The routing table

- All we need to do is determine the “best” interface, and configure that in the table.
- Right?

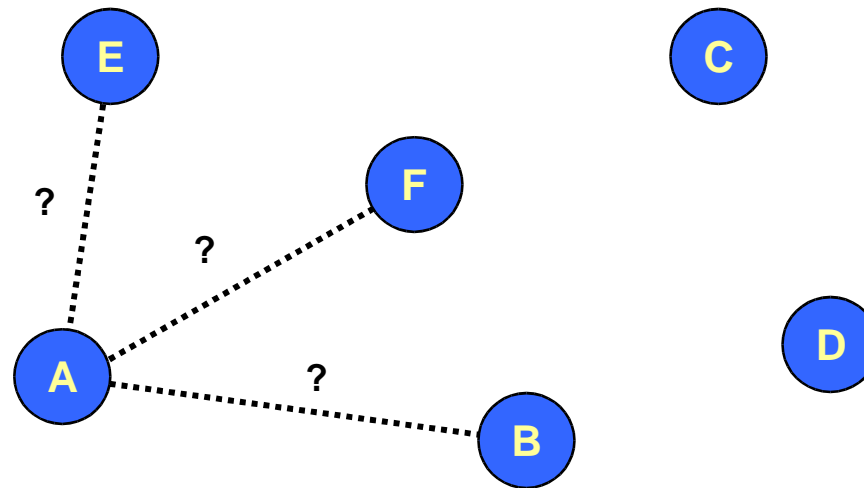
Forwarding Table for A		
Dest	Cost	Next Hop
A	0	A
B	4	B
C	6	E
D	7	B
E	2	E
F	5	E

- The idea of “best” needs to be consistent on all routers to avoid loops.
- Figuring out the best route to all routers from all routers is a pain.
- Routers die, links are cut, people add new stuff without telling you.
- Try configuring [this](#) by hand.



What routing daemon does

- Discovers peers (and networks, and borders, and hosts)
- Sends out information out about its discoveries.
- Collects information from other routers.
- Computes routes (paths) in a network (graph).
- Informs the kernel.



Discovering Peers

- Routers send broadcast “hello out there” messages out each interface, and listen to replies.
- In IP land, an IP address with all 1’s for it’s host part of it’s address is a broadcast message (i.e. intended to be interpreted by every host in the network)
- 200.200.200.255 is an ip address intended for all of the hosts 200.200.200.0 through 200.200.200.254.

Discovering Peers the Easy Way

Router A {

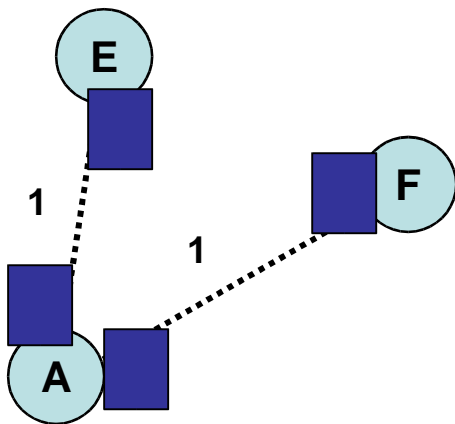
1 1.1.1.1 255.255.255.0

2 1.1.2.1 255.255.255.0

A:1 E:1

A:2 F:1

}



Router Name

Router Interface

Interface Address

Interface Netmask

Our Sockets

- The router-router socket.
 - Communication between routers about their link states.
 - LSU, ACK
 - See OSPF RFC for many more message types
- The router-kernel socket.
 - Communicates with the router's kernel
 - NETLINK family specified in socket() call
 - Add, Delete, Change
 - Man netlink for other message types

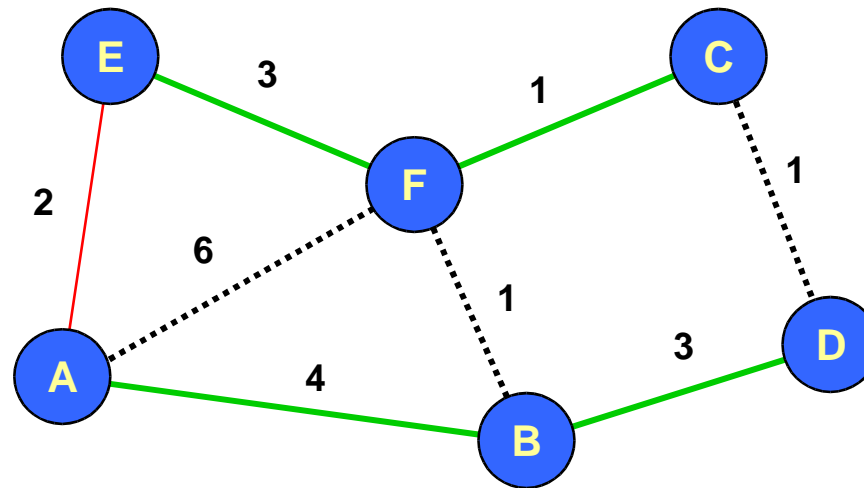
Link down!

- What if a link goes down?
- We find out by not hearing from them in a while.
- Mark the node as down.
- Send out a link-state update message with an incremented sequence number.
- Routers will recompute routes.

Link down!

- Link A-E goes down.
- We want to tell B and F about this, but what's our route to F?
- Solution: use DONTROUTE Sendto() flag.

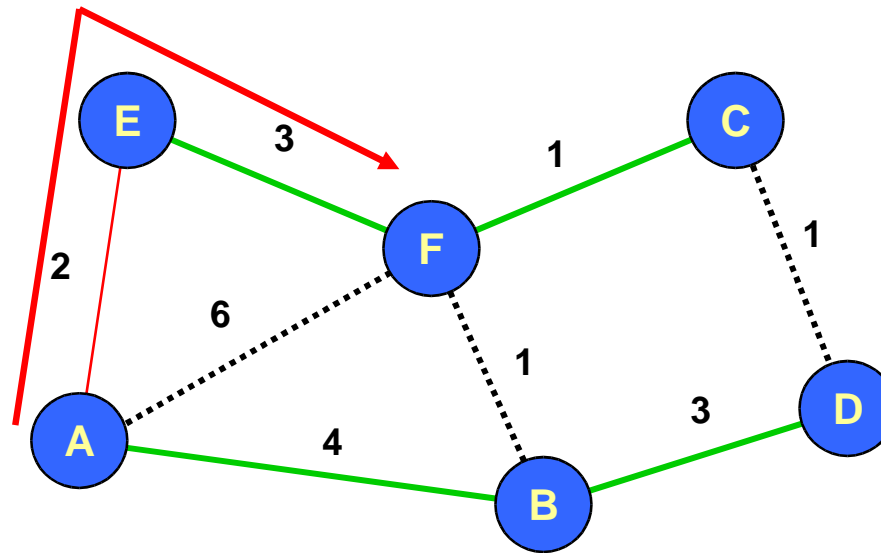
Forwarding Table for A		
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