Seneca

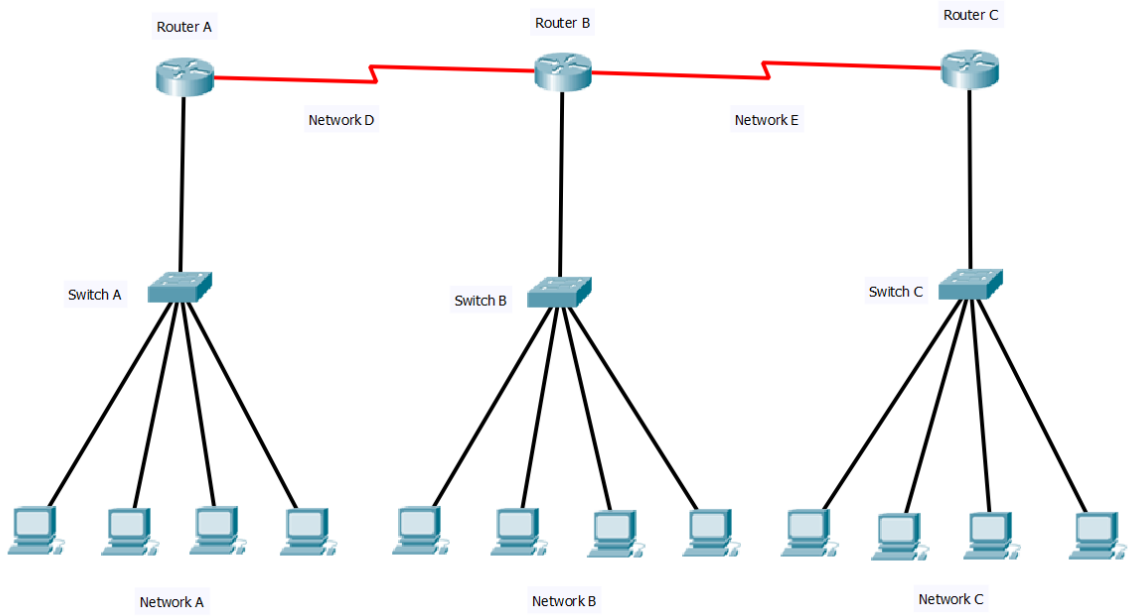
Static Routing

Agenda

- What is Routing?
- Types of Routing?
- Static Routing
- Routing Network
- Next Hop
- Static Routes
- Example

What is Routing?

- Process of selecting path for traffic in a network or multiple networks[1]
- The routes are stored in a Routing table within a Router
- Routers allow different networks to communicate with each other



Types of Routing

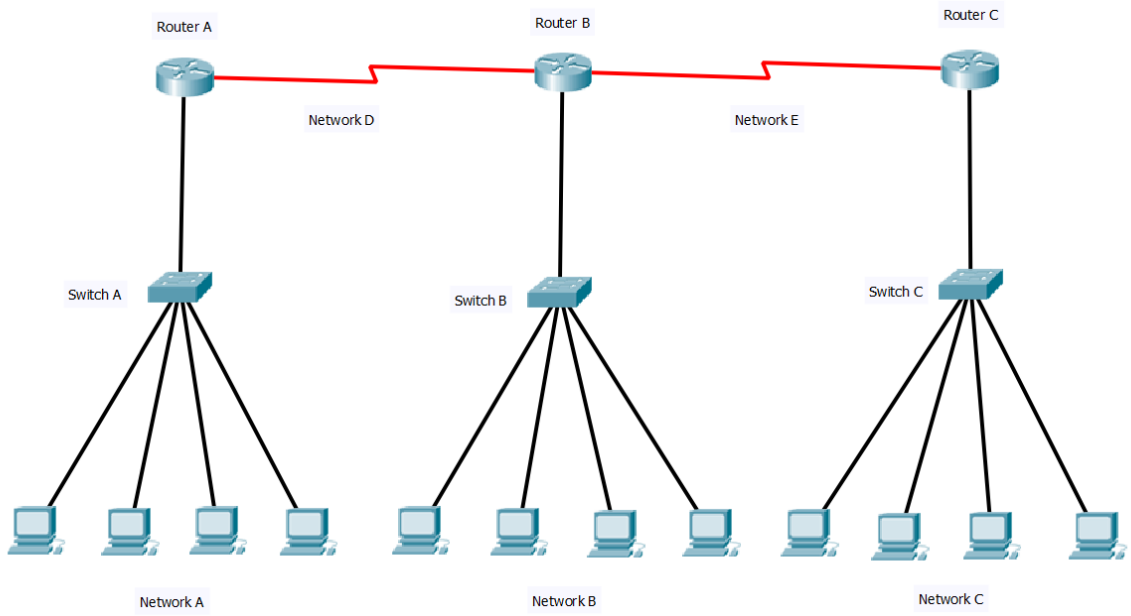
- **Static Routing**
  - Manually configuring routing entry
  - Great for smaller networks
  - Not practical for larger networks
- **Dynamic Routing**
  - Use of routing protocols to determine path
  - Automatic detection of new networks
  - Faster to configure
  - Adapt to changes in networks
  - Ex: Open Shortest Path First (OSPF), Routing Information Protocol (RIP)

Static Routing

- Stores routes to network destinations
- Router A, Router B, and Router C need to be configured
- Information Required
  - Network: The network the routing is trying to reach
  - Next Hop: The next closest router a packet can travel through

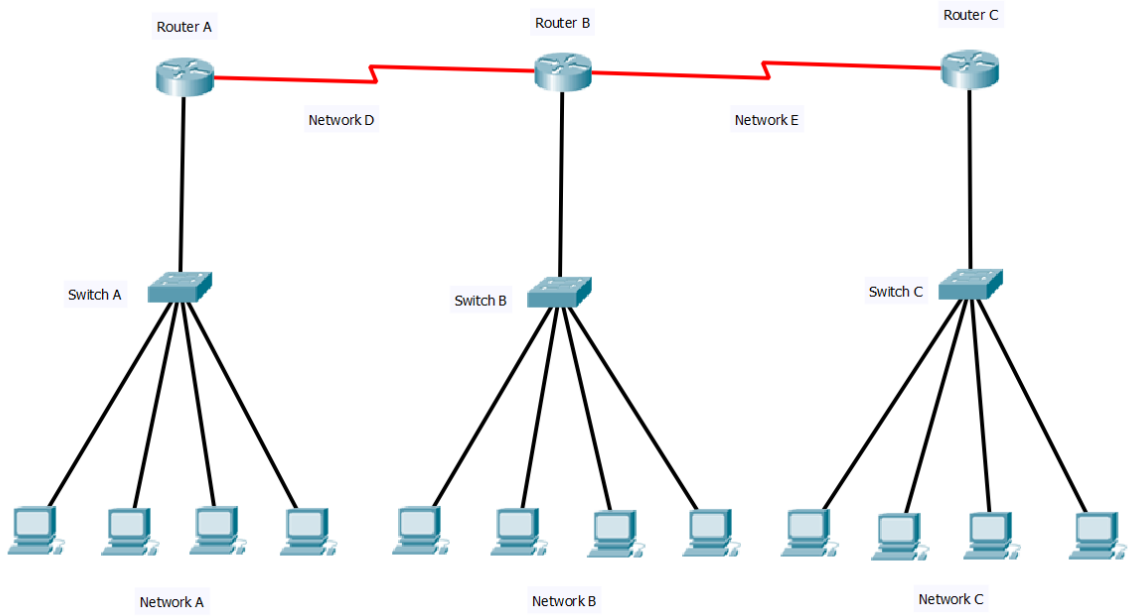
Routing Network

- Router A is only aware of Network A, D
- Router B is only aware of Network B, D, E
- Router C is only aware of Network C, E



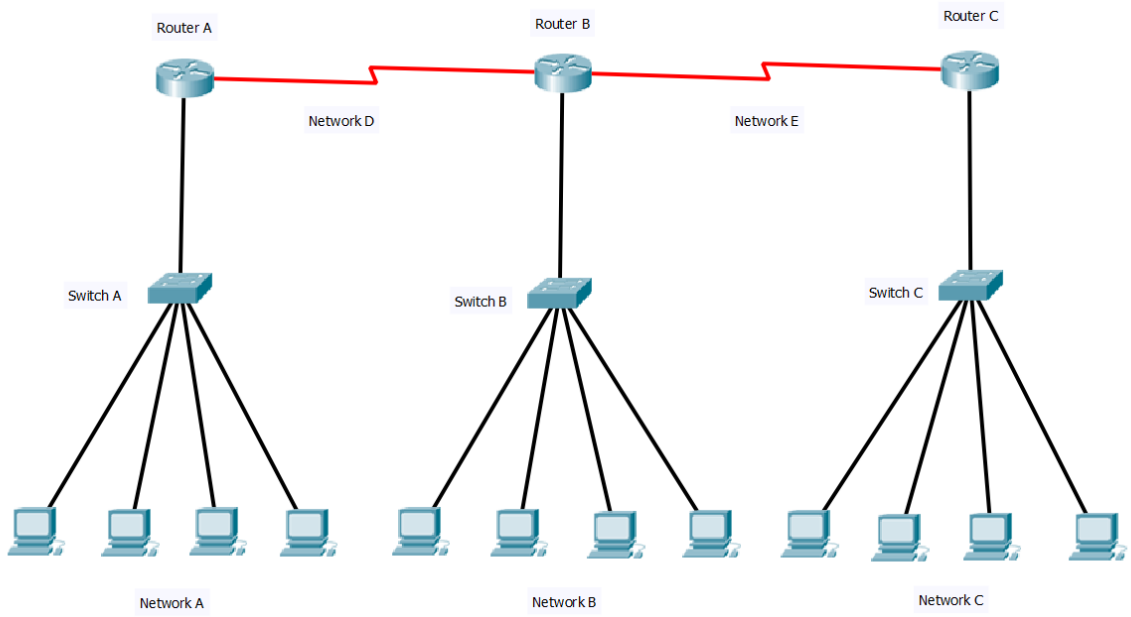
Routing Network

- Router A needs Network B, C configured
- Router B needs Network A, C configured
- Router C needs Network A, B configured



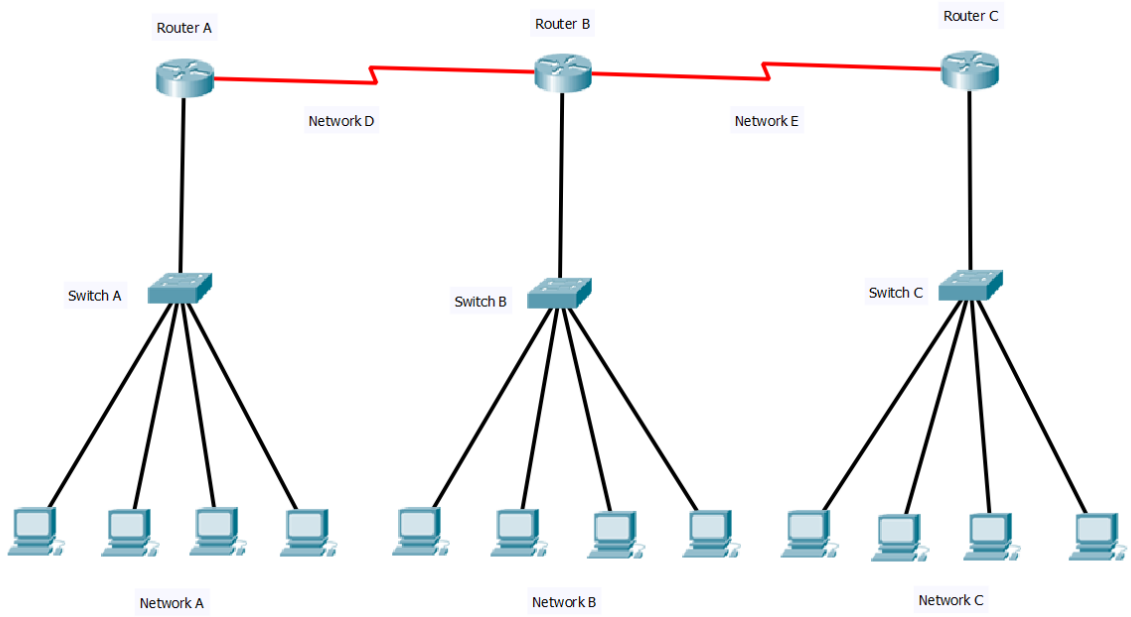
Next Hop: Router A

- Router A next hop is Router B on Network D
- Router A connects to Network B,C through its next hop on Network D



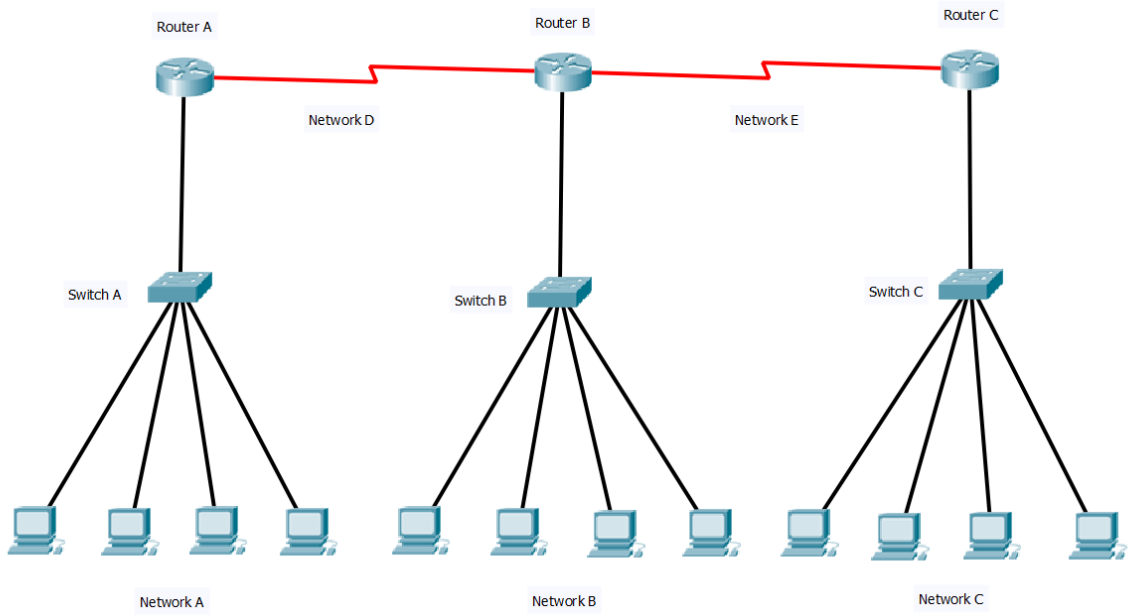
Next Hop: Router C

- Router C next hop is Router B on Network E
- Router C connects to Network A,B through its next hop on Network E



Next Hop: Router B

- Router B next hops are Router A, C on Network D, E respectively
- Router B connects to Network A through Router A on Network D
- Router B connects to Network C through Router C on Network E

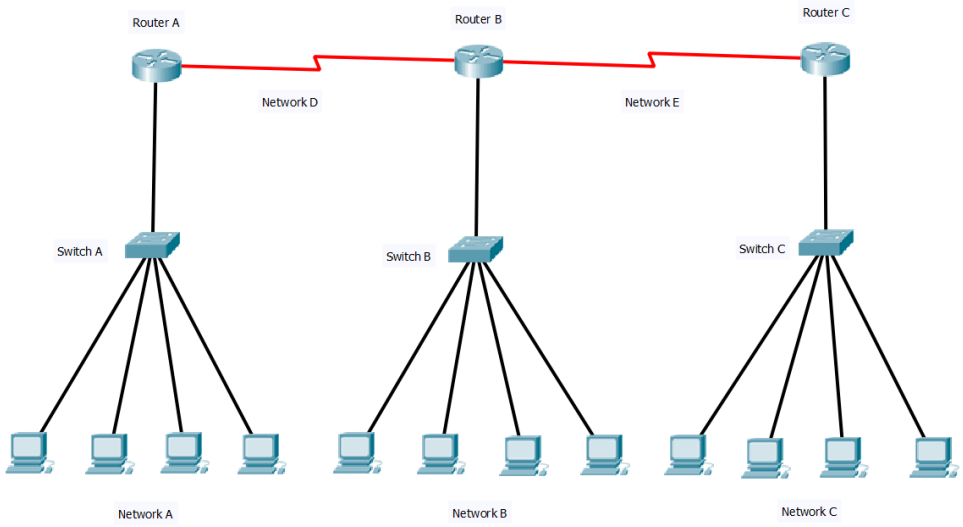


Static Routes

- Router A
  - Network B with next hop Router B on Network D
  - Network C with next hop Router B on Network D
- Router C
  - Network B with next hop Router B on Network E
  - Network A with next hop Router B on Network E
- Router B
  - Network A with next hop Router A on Network D
  - Network C with next hop Router C on Network E

Example

- Given the following networks:
  - Network A: 1.1.1.0/24
  - Network B: 2.2.2.0/24
  - Network C: 3.3.3.0/24
  - Network D: 4.4.4.0/30
  - Network E: 5.5.5.0/30
- Find Static Routes:
  - Router A
  - Router B
  - Router C



Example Solution

- Router A
  - To access 2.2.2.0/24, next hop is 4.4.4.2/30 (Router B on Network D)
  - To access 3.3.3.0/24, next hop is 4.4.4.2/30 (Router B on Network D)
- Router B
  - To access 1.1.1.0/24, next hop is 4.4.4.1/30 (Router A on Network D)
  - To access 3.3.3.0/24, next hop is 5.5.5.2/30 (Router C on Network E)
- Router C
  - To access 1.1.1.0/24, next hop is 5.5.5.1/30 (Router B on Network E)
  - To access 2.2.2.0/24, next hop is 5.5.5.1/30 (Router B on Network E)

Questions

Additional Resources

- Video on Routing
- Video on Basic Routing
- Wiki on Routing