1 Routing Protocols

Consider the network presented in Figure 1. The routers run the Distance Vector routing protocol and apply the "poisoned reverse" rule: if X sends packets to Z via Y, X announces this route to Y with the cost ∞. We assume that all the routers start to operate. Give the data structures maintained by the routers after convergence—fill in the tables below.

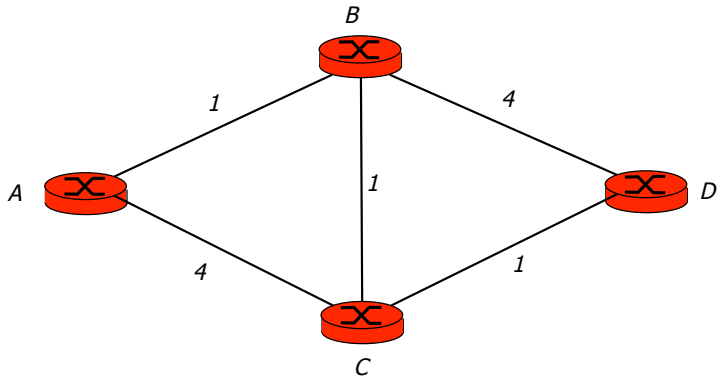

Figure 1: Network topology.

Costs of A	via	
Dest.	B	C
A		
B		
C		
D		

Routing tables of A		
Dest.	via	cost
A		
B		
C		
D		

Vector of A	sent to	
Dest.	B	C
A		
B		
C		
D		

Costs of B	via		
Dest.	A	C	D
A			
B			
C			
D			

Routing tables of B		
Dest.	via	cost
A		
B		
C		
D		

Vector of B	sent to		
Dest.	A	C	D
A			
B			
C			
D			

Costs of C	via		
Dest.	A	B	D
A			
B			
C			
D			

Routing tables of C		
Dest.	via	cost
A		
B		
C		
D		

Vector of C	sent to		
Dest.	A	B	D
A			
B			
C			
D			

Costs of D	via	
Dest.	B	C
A		
B		
C		
D		

Routing tables of D		
Dest.	via	cost
A		
B		
C		
D		

Vector of D	sent to	
Dest.	B	C
A		
B		
C		
D		

Distance Vector Routing

1 Routing - RIP

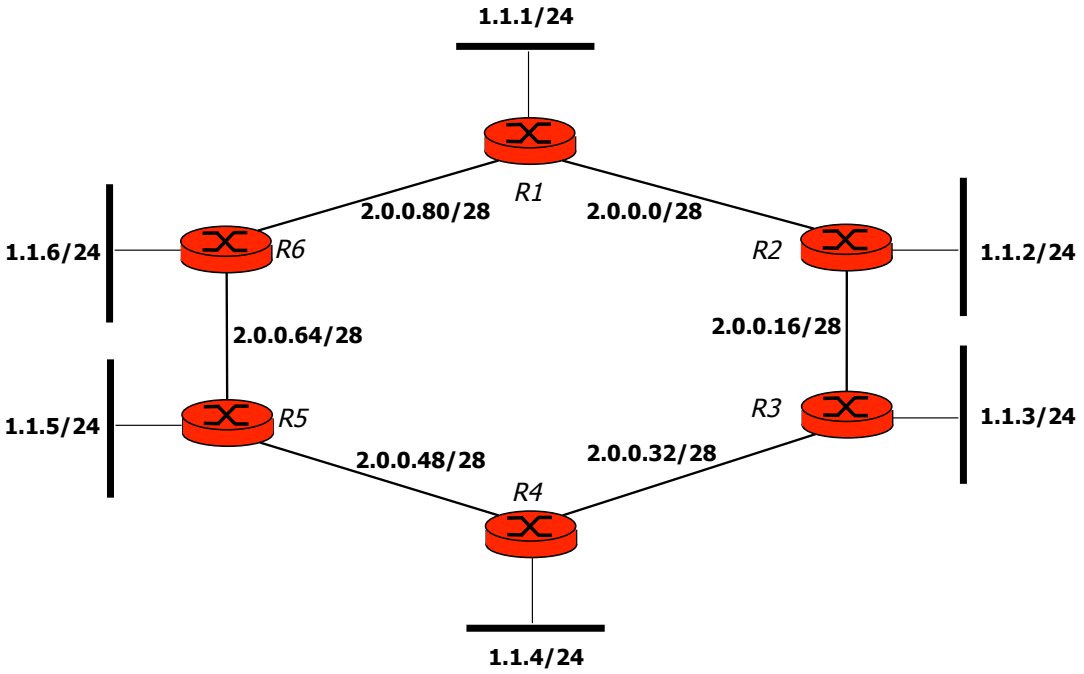

Figure 1 – Example network

We consider the network presented in Figure **??**. All links are Ethernet, R1 to R6 are routers that run a distance routing protocol such as RIP. The cost of a link between two adjacent routers is equal to 1. The cost from a router to a directly connected network is also equal to 1. There are no other networks than those shown in the figure. *Edge networks* have prefixes of the form `1.1.x/24`.

✎ What is the subnet mask at each of the R1 interfaces?

✎ Give the routing table at R1 after the routing protocol convergence for all edge networks and the directly connected networks. Choose the highest possible IP address for the next hop. Use the following notation for the interface names: *eth0*, *eth1*, *eth2*.

Destination network prefix	Next hop	Interface	Distance

Assume that the administrator on router R2 brings down the interface to network `1.1.2/24` and adds another interface to a network with prefix `1.1.7/24`. Explain how the other routers will learn about the change.

Assume that just after this change of configuration, router R2 receives a distance vector from R1 based on the values before the change. Explain what will happen if 1) the routing protocol does not implement Split Horizon? 2) the routing protocol implements Split Horizon?