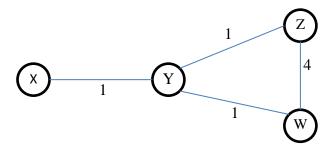
IS 504 - Exercise 5

Consider the following network. In this network, <u>distance vector</u> routing algorithm <u>with poisoned reverse</u> is used. A node sends its distance vector, which consists of <destination, distance > pairs for all destinations, to its neighbors whenever an adjacent link's cost or its distance vector changes.

- a. What is the first advertisement sent by each node after the network is formed?
- b. Give the distance tables in all nodes after the first advertisements given in part (a) are exchanged.
- c. Give the distance tables in all nodes after the distance vector algorithm converges.
- d. Suppose that after the algorithm converges, the cost of link (X, Y) changes to 120. What is <u>the first</u> advertisement message that is sent by Y to each of the neighbors after the link cost change?
- e. Give the distance tables in Z and W <u>just after they receive advertisement from Y</u> in response to link cost change.
- f. What is the first advertisement sent by Z after the link cost change?
- g. What is the first advertisement sent by W after the link cost change?
- h. Will there be a routing loop? If yes, indicate the destination and the nodes involved in the routing loop.



a)

X sends:

to Y:

Dest.	Χ	Υ
Dist.	0	8

Y sends:

to X:

Dest.	Χ	Υ	Z	W
Dist.	8	0	1	1

to	7

10 2.				
Dest.	Χ	Υ	Z	W
Dist.	1	0	8	1

to W:

Dest.	Χ	Υ	Z	W
Dist.	1	0	1	8

Z sends:

to Y:

Dest.	Υ	Z	W
Dist.	8	0	4

to	W:

Dest.	Υ	Z	W
Dist.	1	0	8

W sends:

to Y:

Υ	Ζ	V
8	4	0
	γ ∞	Y Z ∞ 4

tο	7	
ιU	_	

Dest.	Υ	Z	W
Dist.	1	8	0

b)

Distance Table		t	о г	nod	е
in Node X		Χ	Y	Z	M
from node		0	1	2	2
Trom node	Y	8	0	1	1

Distance Table			o r	nod	е
in Node Y			Y	Z	W
	Χ	0	8	8	∞
from node	Y	1	0	1	1
rrom node	Z	8	8	0	4
	W	8	8	4	0

Distance Tab	ole	to node			.
in Node Z		Χ	Y	Z	W
	Y	1	0	8	1
from node	Z	2	1	0	2
	W	8	1	8	0

Distance Table		to node			
in Node W		Χ	Y	Z	W
	Y	1	0	1	8
from node	Z	8	1	0	8
	W	2	1	2	0

c)

Distance Table		to node			
in Node X		Χ	Y	Z	M
from node	X	0	1	2	2
Trom node	Y	∞	0	1	1

Distance Table			o r	nod	e
in Node Y		Χ	Y	Z	M
	Χ	0	8	8	8
from rodo	Y	1	0	1	1
from node	Z	8	8	0	∞
	M	8	8	8	0

Distance Tab	t	:0 1	node	9	
in Node Z		Χ	Y	Z	W
	Y	1	0	8	1
from node	Z	2	1	0	2
	W	2	1	2	0

Distance Table			:0 1	nod	.e
in Node W		Χ	Y	Z	M
	Y	1	0	1	8
from node	Z	2	1	0	2
	W	2	1	2	0

d)

Distance table in node Y becomes:

Distance Tak	to	no	ode		
in Node Y		X	Y	Z	M
	Χ	0	8	8	8
from node	Y	120	0	1	1
Trom node	Z	∞	8	0	8
	M	∞	8	8	0

to X:

Dest.	Χ	Υ	Z	W
Dist.	8	0	1	1

to Z:

Dest.	Χ	Υ	Z	8
Dist.	120	0	8	1

to W:

Dest.	Χ	Υ	Z	W
Dist.	120	0	1	8

e)

Distance Tab	ole	to	n	ode	
in Node Z		X	Y	Z	W
	Y	120	0	8	1
from node	Z	6	1	0	2
	M	2	1	2	0

Distance Table to not		ode	de		
in Node W		X	Y	Z	M
from node	Y	120	0	1	∞
	Z	2	1	0	2
	W	6	1	2	0

f)

to Y:

Destination	Χ	Υ	Z	W
Distance	6	8	0	8

to W:

Destination	Χ	Υ	Z	W
Distance	8	1	0	2

g)

to Y:

Destination	Χ	Υ	Z	W
Distance	6	8	8	0

to Z:

Destination	Χ	Υ	Z	8
Distance	8	1	2	0

h)

Yes, there is a routing loop.

Packets for destination X:

$$z \rightarrow w \rightarrow z \rightarrow w \rightarrow ...$$