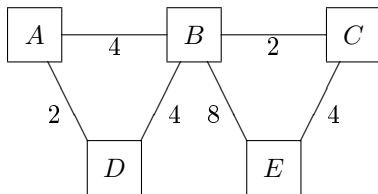


Computer Networks and Distributed Systems Exercise Sheet 8

Please note: For exercise 8.1 you earn double points.

Exercise 8.1

In the following network a distance vector algorithm is used for dynamic routing. On the next page you find hints and a template for solving the exercise.



- Realize the computation of the shortest path according to the distance vector algorithm. Create the tables for the times $t = 0, t = 1, \dots$, until the tables do not change any more.
- How does the algorithm propagate the information that the connection $B-C$ has failed or that the costs for that connection have increased? Consider the case that the costs for that connection have increased to 16.
- How does the algorithm propagate information about a new connection $D-E$ with cost 3? (start from the situation in a))

Tables for the distance vector algorithm have the following form:

Router	Port 1	...	Port N
To A			
To B			
...			
To X			

In the beginning every router knows the costs for its active ports ($t = 0$):

A	Via B	Via D	B	Via A	Via C	Via D	Via E	C	Via B	Vie E	D	Via A	Via B	E	Via B	Via C
To A			To A	4				To A			To A	2		To A		
To B	4		To B					To B	2		To B		4	To B	8	
To C			To C		2			To C			To C			To C		4
To D		2	To D			4		To D			To D			To D		
To E			To E				8	To E		4	To E			To E		

In the next step ($t = 1$) every router transmits its optimal routing information to the direct neighbors:

A	Via B	Via D	B	Via A	Via C	Via D	Via E	C	Via B	Vie E	D	Via A	Via B	E	Via B	Via C
To A			To A	4		6		To A	6		To A	2	8	To A	12	
To B	4	6	To B					To B	2	12	To B	6	4	To B	8	6
To C	6		To C		2		12	To C			To C		6	To C	10	4
To D	8	2	To D	6		4		To D	6		To D			To D	12	
To E	12		To E		6		8	To E	10	4	To E		12	To E		

Use the tables on the next page to complete the further steps of the algorithm.

A	Via B	Via D	B	Via A	Via C	Via D	Via E	C	Via B	Vie E	D	Via A	Via B	E	Via B	Via C
To A			To A					To A			To A			To A		
To B			To B					To B			To B			To B		
To C			To C					To C			To C			To C		
To D			To D					To D			To D			To D		
To E			To E					To E			To E			To E		

A	Via B	Via D	B	Via A	Via C	Via D	Via E	C	Via B	Vie E	D	Via A	Via B	E	Via B	Via C
To A			To A					To A			To A			To A		
To B			To B					To B			To B			To B		
To C			To C					To C			To C			To C		
To D			To D					To D			To D			To D		
To E			To E					To E			To E			To E		

A	Via B	Via D	B	Via A	Via C	Via D	Via E	C	Via B	Vie E	D	Via A	Via B	E	Via B	Via C
To A			To A					To A			To A			To A		
To B			To B					To B			To B			To B		
To C			To C					To C			To C			To C		
To D			To D					To D			To D			To D		
To E			To E					To E			To E			To E		

A	Via B	Via D	B	Via A	Via C	Via D	Via E	C	Via B	Vie E	D	Via A	Via B	E	Via B	Via C
To A			To A					To A			To A			To A		
To B			To B					To B			To B			To B		
To C			To C					To C			To C			To C		
To D			To D					To D			To D			To D		
To E			To E					To E			To E			To E		