Rajat Sethi – ECE 4380 – HW 8

1a.)

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| --- | --- | --- |
| A’s Routing Table | | |
| Destination | Cost | NextHop |
| B | 7 | B |
| C | 14 | B |
| D | 15 | B |
| E | 12 | B |
| F | 14 | B |

1b.)

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| --- | --- | --- |
| A’s Routing Table | | |
| Destination | Cost | NextHop |
| B | 7 | B |
| C | 9 | C |
| D | 15 | B |
| E | 11 | C |
| F | 12 | C |

2a.)

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| --- | --- |
| Routing Vector (C to A) | |
| Destination | Distance |
| A | ∞ |
| B | 1 |
| C | 0 |
| D | 11 |
| E | 5 |
| F | 4 |

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| --- | --- |
| Routing Vector (C to B) | |
| Destination | Distance |
| A | 2 |
| B | ∞ |
| C | 0 |
| D | ∞ |
| E | ∞ |
| F | 4 |

2b.)

No, the looping problem is not fixed. Split horizon only works on 2-hop loops, but the path to D is a 4-hop loop.

3.)

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| --- | --- | --- | --- |
| Step | Confirmed | Tentative | Comments |
| 1 | (A, 0, -) |  | A is the starting node, check LSP. |
| 2 | (A, 0, -) | (B, 2, B) (C, 8, C) | A has link with B and C, add nodes to tentative. |
| 3 | (A, 0, -) (B, 2, B) | (C, 8, C) | B has lowest cost, add to confirmed. |
| 4 | (A, 0, -) (B, 2, B) | (C, 7, B) (D, 4, B) (E, 5, B) (G, 9, B) | Check B’s LSP. B has link with C, D, E, and G. Also, B has a faster route to C, which is updated in tentative. |
| 5 | (A, 0, -) (B, 2, B) (D, 4, B) | (C, 7, B) (E, 5, B) (G, 9, B) | D has lowest cost, add to confirmed. |
| 6 | (A, 0, -) (B, 2, B) (D, 4, B) | (C, 7, B) (E, 5, B) (G, 8, B) | Check D’s LSP. D has a faster route to G, which is updated in tentative. |
| 7 | (A, 0, -) (B, 2, B) (D, 4, B) (E, 5, B) | (C, 7, B) (G, 8, B) | E has lowest cost, add to confirmed. |
| 8 | (A, 0, -) (B, 2, B) (D, 4, B) (E, 5, B) | (C, 6, B) (F, 12, B) (G, 8, B) | Check E’s LSP. E has link with F. Also, E has a faster route to C, which is updated in tentative. |
| 9 | (A, 0, -) (B, 2, B) (C, 6, B) (D, 4, B) (E, 5, B) | (F, 12, B) (G, 8, B) | C has lowest cost, add to confirmed. |
| 10 | (A, 0, -) (B, 2, B) (C, 6, B) (D, 4, B) (E, 5, B) | (F, 11, B) (G, 8, B) | Check C’s LSP. C has a faster route to F, which is updated in tentative. |
| 11 | (A, 0, -) (B, 2, B) (C, 6, B) (D, 4, B) (E, 5, B) (G, 8, B) | (F, 11, B) | G has lowest cost, add to confirmed. |
| 12 | (A, 0, -) (B, 2, B) (C, 6, B) (D, 4, B) (E, 5, B) (G, 8, B) | (F, 11, B) | G has no unconfirmed neighbors. |
| 13 | (A, 0, -) (B, 2, B) (C, 6, B) (D, 4, B) (E, 5, B) (F, 11, B) (G, 8, B) |  | F has lowest cost, add to confirmed. Algorithm complete. |

4a.)

6

1

6

1

5

1

3

2

1

1

4

1

5

1

1

1

5

1

3

4

4b.)

A 🡪 F 🡪 B 🡪 E 🡪 G (Cost: 6)

4c.)

Yes, the path changes to:

A 🡪 F 🡪 B 🡪 D 🡪 G (Cost: 4)

4d.)

The path changes to:

A 🡪 F 🡪 B 🡪 D 🡪 A 🡪 F 🡪 B 🡪 D … (Infinite Loop)

This occurs because B does not update its forwarding table and continuously sends packets to D, and D sends packets to A expecting the packet to go from A🡪F🡪B🡪E🡪G.

5a.)

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| 4 | Node B generates triggered update with DV (dest=D, cost=6) | Node C had these DVs for D before receiving triggered update.   Via A (dest=D, cost=1)  Via B (dest=D, cost=4)  After changes to C’s DV table  Via B (dest=D, cost=6) |
| 5 | Node C generates triggered update with DV (dest=D, cost=7) | Node B had these DVs for D before receiving triggered update.  Via A (dest=D, cost=1)  Via C (dest=D, cost=5)  After changes to B’s DV table  Via C (dest=D, cost=7) |
| 6 | Node B generates triggered update with DV (dest=D, cost=8) | Node C had these DVs for D before receiving triggered update.   Via A (dest=D, cost=1)  Via B (dest=D, cost=6)  After changes to C’s DV table  Via B (dest=D, cost=8)  Node C’s best route to D: next=A, cost=8 (cost increased from 7 to 8) |
| 7 | Node C generates triggered update with DV (dest=D, cost=8) | Node B had these DVs for D before receiving triggered update.  Via A (dest=D, cost=1)  Via C (dest=D, cost=7)  After changes to B’s DV table  Via C (dest=D, cost=8)  Node B’s best route to D: next=C, cost=9 (cost increased from 8 to 9) |
| 8 | Node B generates triggered update with DV (dest=D, cost=9) | Node C had these DVs for D before receiving triggered update.   Via A (dest=D, cost=1)  Via B (dest=D, cost=8)  After changes to C’s DV table  Via B (dest=D, cost=10)  Node C does not change route to D, so no triggered update and sequence done. |

5b.)

|  |  |  |
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| 1 | Link cost increase from 1 to 10 | Node B had these DVs for Destination D before change.  Via A (dest=D, cost=1)  Via C (dest=D, cost=∞)  After increase in link cost:  Node B’s best route to D: next=A, cost=11 |
| 2 | Node B generates triggered update with DV (dest=D, cost=11) | Node C had these DVs for Destination D before receiving triggered update.  Via A (dest=D, cost=1)  Via B (dest=D, cost=∞)  After changes to C’s DV table  Via B (dest=D, cost=12)  Node C’s best route to D: next=A, cost=8 |
| 3 | Node C generates triggered update with DV (dest=D, cost=8) | Node B had these DVs for Destination D before receiving triggered update.  Via A (dest=D, cost=1)  Via C (dest=D, cost=∞)  After changes to B’s DV table  Via C (dest=D, cost=8)  Node B’s best route to D: next=C, cost=9 |
| 4 | Node B generates triggered (poisoned) update with DV (dest=D, cost=∞) | Node C had these DVs for Destination D before receiving triggered update.  Via A (dest=D, cost=8)  Via B (dest=D, cost=∞)  Node C does not change the route to D, so no triggered update and sequence done. |

6a.)

|  |  |
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| ISP-1 | |
| Address | Next Hop |
| D2.0.0.0/8 | ISP-2 |
| D3.0.0.0/8 | ISP-3 |
| D1.A3.0.0/16 | Cust-1 |
| D1.B0.0.0/12 | Cust-2 |

|  |  |
| --- | --- |
| ISP-2 | |
| Address | Next Hop |
| D1.0.0.0/8 | ISP-1 |
| D3.0.0.0/8 | ISP-3 |
| D2.0A.0.0/16 | Cust-3 |
| D2.0B.0.0/16 | Cust-4 |

|  |  |
| --- | --- |
| ISP-3 | |
| Address | Next Hop |
| D1.0.0.0/8 | ISP-1 |
| D2.0.0.0/8 | ISP-2 |

6b.)

|  |  |
| --- | --- |
| ISP-1 | |
| Address | Next Hop |
| D2.0.0.0/8 | ISP-2 |
| D3.0.0.0/8 | ISP-3 |
| D1.A3.0.0/16 | Cust-1 |
| D1.B0.0.0/12 | Cust-2 |
| D2.0A.0.0/16 | Cust-3 |

|  |  |
| --- | --- |
| ISP-2 | |
| Address | Next Hop |
| D1.0.0.0/8 | ISP-1 |
| D3.0.0.0/8 | ISP-3 |
| D1.A0.0.0/12 | Cust-1 |
| D2.0A.0.0/16 | Cust-3 |
| D2.0B.0.0/16 | Cust-4 |

|  |  |
| --- | --- |
| ISP-3 | |
| Address | Next Hop |
| D1.0.0.0/8 | ISP-1 |
| D2.0.0.0/8 | ISP-2 |

6c.)

|  |  |
| --- | --- |
| ISP-1 | |
| Address | Next Hop |
| D2.0.0.0/8 | ISP-2 |
| D3.0.0.0/8 | ISP-3 |
| D1.B0.0.0/12 | Cust-2 |

|  |  |
| --- | --- |
| ISP-2 | |
| Address | Next Hop |
| D1.0.0.0/8 | ISP-1 |
| D3.0.0.0/8 | ISP-3 |
| D2.A0.0.0/12 | Cust-1 |
| D2.0B.0.0/16 | Cust-4 |

|  |  |
| --- | --- |
| ISP-3 | |
| Address | Next Hop |
| D1.0.0.0/8 | ISP-1 |
| D2.0.0.0/8 | ISP-2 |
| D3.0A.0.0/16 | Cust-3 |

7.) I have no idea how to solve this problem.