Homework 4
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Remove all highlights before typing your answer.

1 Routing

(a) (a) Original Routing Table:

Host A			Host D		
Dest	**Next**	**Cost**	**Dest**	**Next**	**Cost**
A	*	0	A	A	2
B	B	2	B	C	2
C	D	3	C	C	1
D	D	2	D	*	0
E	D	5	E	C	3

Doubled Routing Table:

Host A			Host D		
Dest	**Next**	**Cost**	**Dest**	**Next**	**Cost**
A	*	0	A	A	4
B	B	4	B	C	4
C	D	6	C	C	12
D	D	4	D	*	0
E	D	10	E	C	6

(b) Original Link Costs:

Host A			Host D		
Dest	**Next**	**Cost**	**Dest**	**Next**	**Cost**
A	*	0	A	A	2
B	–	–	B	–	–
C	D	3	C	–	–
D	D	2	D	*	0
E	D	5	E	–	–

Double Linked Costs:

Host A			Host D		
Dest	**Next**	**Cost**	**Dest**	**Next**	**Cost**
A	*	0	A	A	4
B	–	–	B	–	–
C	D	6	C	–	–
D	D	4	D	*	0
E	D	10	E	–	–

(c) Distance Vector:

Host A	
Dest	**Cost**
A	0
B	–
C	6
D	4
E	10

Updated Routing Table:

Host D		
Dest	**Next**	**Cost**
A	A	4
B	–	–
C	A	10
D	*	0
E	A	14

(d) Distance Vector:

Host A	
Dest	**Cost**
A	4
B	–
C	10
D	0
E	7

Updated Routing Table:

Host D		
Dest	**Next**	**Cost**
A	*	0
B	–	–
C	D	14
D	D	4
E	D	18

(b) (12)

DHCP is used to simplify maintenance and setup of networked computers. It provides a mechanism for configuring nodes. The entities of DHCP are DHCP relay, and DHCP server, etc..

(c) (13)

DHCP is good for care-of-address for mobile nodes. Additionally, its good for other parameters such as address of default router or DNS servers.

(d) (14)

Differences between multi-hop ad hoc networks and other networks include, more than intermediate nodes along a path via wireless links. This is useful in extending coverage and improving connectivity in a network. The other advantage of multi-hop networks is that transmission over multiple short links requires less transmission power.

(e) (15)

Multi-hop routing is complicated because it can be asymmetric, non-transitive, and time-varying. For example, one special challenge is the overlapping of ranges of several nodes. Additionally, there are bandwidth and resource constraints, erroneous transmission mediums, and location-dependent contention problems.

(f) (16)

Compared to routing data exchange, changes are very infrequent, so both algorithms assume a relatively stable network. Additionally, both establish routing tables regardless for the need of communication, making it difficult to use in multi-hop ad hoc networks, and using unnecessary bandwidth.

(g) (17)

AODV offers quick adaptation to dynamic link conditions, low processing and memory overhead, and low network utilization. The distance vector algorithm determines the best route for data packets based on distance. Extensions are needed to improve performance like reducing routing and MAC loads.

(h) (18)

Dynamic source routing divides keeping the route running and finding a route, that way it only establishes a route when communication is required. In fixed networks, routes are always calculated in advance.

(i) (19)

Most algorithms are incapable of handling asymmetric links. Additionally unidirectional links pose problems as well. For example, in DSR the receiver sends packets between source and destination by choosing the routers in the reverse order. But if some reverse links do not exist the route still needs to be found.

(j) (21)

Location information routing is designed for easy scalability in networks of a few hundred nodes. Location information routing is also beneficial in reducing routing overhead by reducing the propagation of control messages.

(k) (22)

Cars moving quickly throughout a city would change the topology too fast for all routing algorithms to adapt to. Flooding would be a potential solution. Its easier on the highway because since speeds are faster there are groups of cars with similar speed and direction with allows for forwarding of these cars.

(l) Please provide the Readme for your Geographic Routing program.