Name Removed

Wireless/Mobile Networking

Homework 8

**P13.3**

Number nodes (N) = 100

Number nodes each node is connected to (Nc) = 4

Links per node (Nl) = Nc = 4

Total connections (C) = N\*Nc = 100\*4 = 400

Number of nodes attached to connections (Cn) = 2

Total communication links = C/Cn = 400/2 = 200

**P13.7**

1. DSR:

If node 6 has a route to 23 in its route cache that is not expired, it will use the route.

If node 6 does not have the route, it starts route discovery. It will send its address (6) and the desired destination address (23) along to all its adjacent nodes. If the adjacent nodes have the destination route, it will reply with the route. Otherwise, it’s adds its own address onto the previous address(es) and sends it on. A reply will be generated when an unexpired route has been found from an intermediate node or the request reaches the desired destination. The reply is sent over the same path if the links are symmetric. Otherwise, it uses the same process in the opposite direction. The reply should contain the routing info for a successful message transfer.

1. TORA:

If node 6 has a route to node 23, it will use the route.

Otherwise, a route query will go through the network until it either reaches a node with a path to the destination or arrives at the destination (23). The said node will respond with an update packet that contains its height with respect to the destination (23). As the packet goes back through the network, each hop will increase the height from said node to destination (23) by one until it reaches the original requester (6).

**P15.8**

Number frequencies = 5

Number freq. hopping sequences = 5\*4\*3\*2\*1 = 5! = 120 sequences

**P15.9**

If maintaining freq. hopping within each set of channels:

Number frequencies (set 1) = 5

Number frequencies (set 2) = 5

Number sequences = 5! + 5! = 120 + 120

= 240 possible sequences

If maintaining freq. hopping within the entire set of channels:

Number frequencies (n) = 10

Number frequencies we need to use (k) = 5

Possible frequency combinations (Fc) = n choose k = 10 choose 5

Fc = n choose k = n!/(k!(n-k)!) = 10!/(5!(10-5)!) = 3628800/(120\*120) = 252

Possible arrangement of frequencies (Fa) = k! = 5! = 120

Number sequences = Fc\*Fa = 252\*120 = 30240

The entire set of 10 frequencies should be utilized because it gives more possible sequences.