

Homework Problem Set 4 Solutions

4.6

$$P(\text{packet loss}) = 1 - (1 - P(\text{fragment loss}))^{10}$$

- a. $P(\text{loss of packet}) = P(\text{packet loss})^2$
- b. $P(\text{loss of packet}) = 1 - (1 - P(\text{fragment loss})^2)^{10}$
- c. Using the same Ident field, enables reassembly for correct fragments

4.11

Short timeout – creates periodic ARP broadcasts, creating a large control overhead in the system.

Large timeout – cannot detect stale machines, creating packet losses.

4.14

- a. Send burst of ARP requests for burst IP packets which do not have the IP-ARP mapping yet.
- b. Queue the IP packets for next hops whose IP-ARP is unknown, but an ARP Req has been broadcasted.
- c. Causes packet dropping for the initial IP packets.

4.15 and 4.16. Run Dijkstra on the problem instances. For the link state case, you need go through the flooding process. Similar to examples in text.

4.21.

- a. Interface 0
- b. R2
- c. R4 (default)
- d. R3
- e. R4 (default)

4.24

If $C \Rightarrow B$ (reachability to E in 2 hops), before $A \Rightarrow C$ (Link loss to E),
Then B assumes that it can reach E through C
 $B \Rightarrow A$, (reachability to E in 3 hops) creating a routing loop.

4.40

Create networks such that host addresses match the required size

- a. $A 2^7$
- $B 2^6$
- $C 2^5$
- $D 2^5$

Subnet masks

A FF.FF.FF.80

B FF.FF.FF.C0

C FF.FF.FF.E0

D FF.FF.FF.E0

b. Split network A which has the most unused address space into smaller subnets

A 2^6 , 2^5

B 2^6

C 2^5

D 2^6

Subnet masks

A FF.FF.FF.C0, FF.FF.FF.E0

B FF.FF.FF.C0

C FF.FF.FF.E0

D FF.FF.FF.C0

4.46

Use longest length matching to obtain

a. F

b. B

c. E

d. A

e. D

f. C