

4 1.

| Step | Confirmed | Tentative |
|------|---|--------------------------------|
| 1 | (A,0,-) | |
| 2 | (A,0,-) | (B,2,B) (C,7,C) |
| 3 | (A,0,-) (B,2,B) | (E,5,B) (D,7,B) (C,7,C) |
| 4 | (A,0,-) (B,2,B) (E,5,B) | (D,6,B) (C,7,C) <u>(F,7,B)</u> |
| 5 | (A,0,-) (B,2,B) (E,5,B) (D,6,B) | <u>(C,7,C)</u> <u>(F,7,B)</u> |
| 6 | (A,0,-) (B,2,B) (E,5,B) (D,6,B) (F,7,B) | <u>(C,7,C)</u> |
| 7 | (A,0,-) (B,2,B) (E,5,B) (D,6,B) (C,7,C) | |

1 2. A: 233.255.10.0/24

B: 255.255.10.8/25C: 255.255.10.1/25

3.

- 7
- a.
1. 128.174.224.0 Router 3 →
 2. 128.174.254.7 Interface 3
 3. 128.174.252.0 /23 Interface 2
 4. 128.174.224.0 Router 3 →
 5. default
 6. 128.174.254.16 Router 1

- b.
1. 0, since 20 bits mask cannot get ".248" →
 2. $2^{(32-26)} = 64$
 3. $2^{(32-23)} = 512$
 4. 1, there's no mask
 5. $2^{(32-28)} = 16$
 6. $2^{(32-19)} = 8192$
 7. 2^{32} , because all bits can be used

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4. a. $k + k^2 + k^3 + k^4 + \dots + k^N = k(k^N - 1)/(k - 1)$

b. $N * k^N$

c. if sending a fraction of unicasts:

$$t1 = f * N * k^N$$

if sending a multicast:

$$t2 = k(k^N - 1)/(k - 1)$$

$$t1 = t2$$

$$f * N * k^N = k(k^N - 1)/(k - 1)$$

$$f = \frac{k(k^N - 1)}{(k - 1) * N * k^N}$$

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5. a. $P = 1 - (0.9)^8 = 0.5695$

if transmitted twice,

b. $0.5695^2 = 0.3243$

c. every fragment can be transmitted twice

$$P = 1 - (1 - 0.01)^8 = 0.0773$$

d. Ident is for labeling every fragment. With this field, the receiver can recover the packet using a new fragment from the second packet.

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6. eth0 Link encap:Ethernet HWaddr 08:00:27:f7:e8:42

inet addr:10.0.2.15 Bcast:10.0.2.255 Mask:255.255.255.0

inet6 addr: fe80::a00:27ff:fe77:e842/64 Scope:Link

UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1

RX packets:30 errors:0 dropped:0 overruns:0 frame:0

TX packets:82 errors:0 dropped:0 overruns:0 carrier:0

collisions:0 txqueuelen:1000

RX bytes:3930 (3.9 KB) TX bytes:11846 (11.8 KB)

```
lo    Link encap:Local Loopback
      inet addr:127.0.0.1  Mask:255.0.0.0
      inet6 addr: ::1/128 Scope:Host
      UP LOOPBACK RUNNING  MTU:65536  Metric:1
      RX packets:50 errors:0 dropped:0 overruns:0 frame:0
      TX packets:50 errors:0 dropped:0 overruns:0 carrier:0
      collisions:0 txqueuelen:0
      RX bytes:3871 (3.8 KB)  TX bytes:3871 (3.8 KB)
```