

Section 1

1. TRUE (Host Routing)
2. TRUE
3. FALSE
4. TRUE (Circuit Switching is better)
5. FALSE
6. FALSE (20 bytes, at least)
7. TRUE
8. TRUE
9. DISTRIBUTED PROGRAMMING is either the middleware software or the application software. NETWORK PROGRAMMING is a fundamental building block of a distributed system.
10. - Abstraction of an end-to-end communications pipe between two applications
- A programming API

Section 2

1. $D = 2(6\text{ MHz})(\log_2(4)) = 24,000,000 \frac{\text{bits}}{\text{second}}$
2. 65,535 bytes (16-bit unsigned int)
3. 130.127.64.2

$$130 = 10000010$$

$$127 = 01111111$$

$$64 = 01000000$$

$$2 = 00000010$$

In binary:

10000010.01111111.01000000.00000010

4. 130.127.64.2 is Class B so the directed broadcast address is under the subnet mask 255.255.0.0 and is:

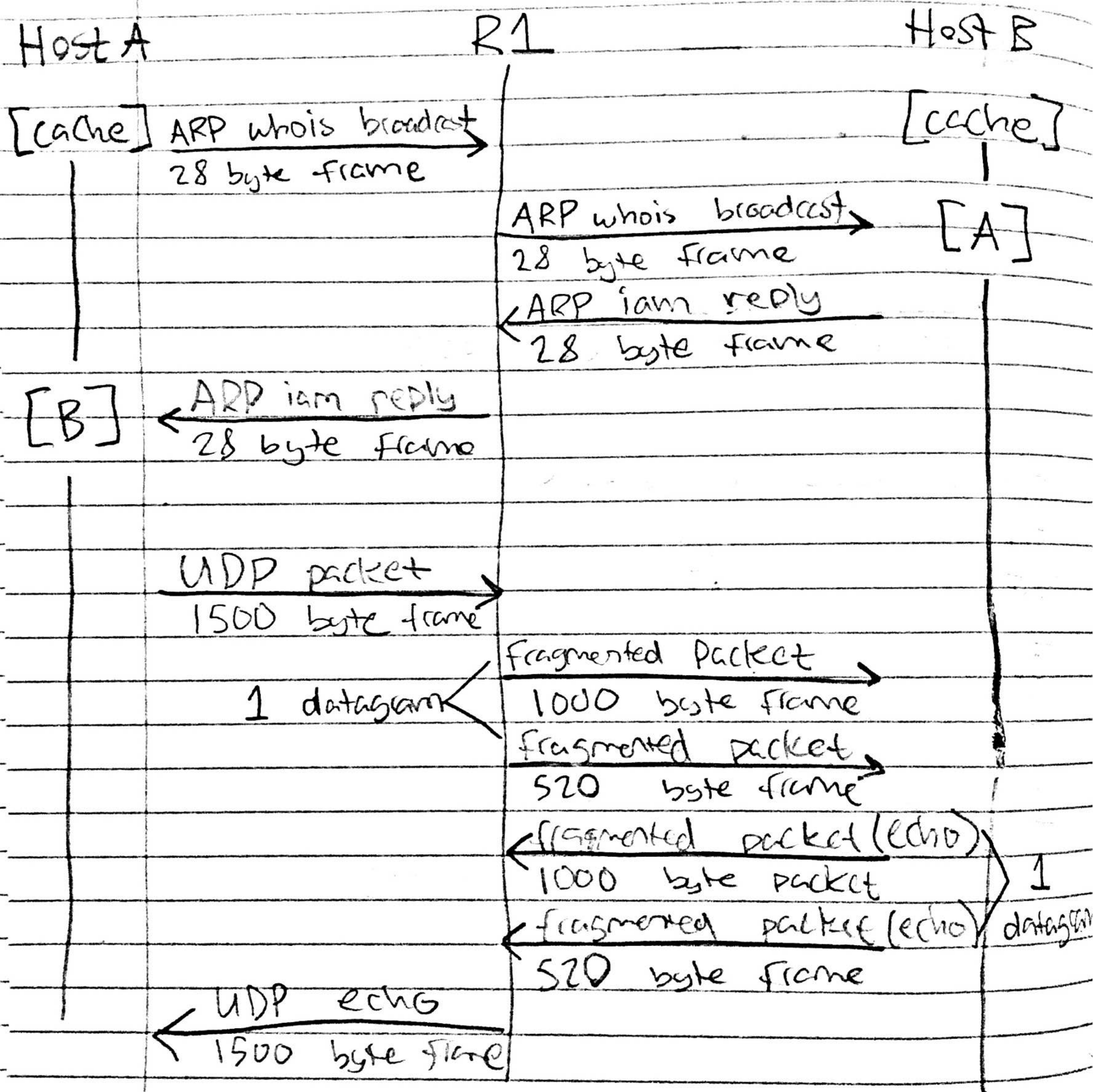
130.127.255.255

5. Class C addresses are defined by the first 3 bits being "110", meaning there are only 21 network-defining bits left.

Each of these networks have 256 possible host numbers, although we don't count the hosts 0 and 255 as they are broadcast addresses. Thus the percentage is:

$$(2^{21})(254) / (2^{32}) \approx 12.4\%$$

6. A total of 10 frames are sent:



Section 3

1. The first byte 0x01,
2. The RTT time is longer on the first iteration because the client has to establish a connection with the server before communicating. After the first iteration is done, the connection is still valid and the RTT is less for future trips.

3. `printf(`

```
"ip: %s, In  
port: %d  In",
```

```
inet_ntoa(echo ClintAddr.sin_addr),  
echo ClintAddr.sin_port);
```

OR `char str [cliAddrLen];`

```
inet_ntop(AF_INET, &(echo ClintAddr.sin_addr),  
str, cliAddrLen);
```

The last method I got from Beeg's Guide to Programming, simply print str for the ip address.