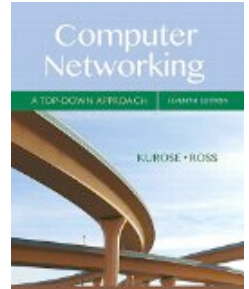


COMP 375: Lecture 26



- **News & Notes:**
 - Quiz #6 in class today
 - Midterm #2 in class next Friday (April. 13)
 - Project #4 due Monday, April 16
- **Reading (Mon, Apr. 9)**
 - Sections 4.4, 5.{1-2.0}

Quiz #6

- Closed book, closed notes.
- Happy “Sorry Charlie Day”



Project 4: Two syntactic things

- Special integer types:
 - uint8_t: 8-bit unsigned int
 - uint32_t: 32-bit unsigned int

- Enumeration Types

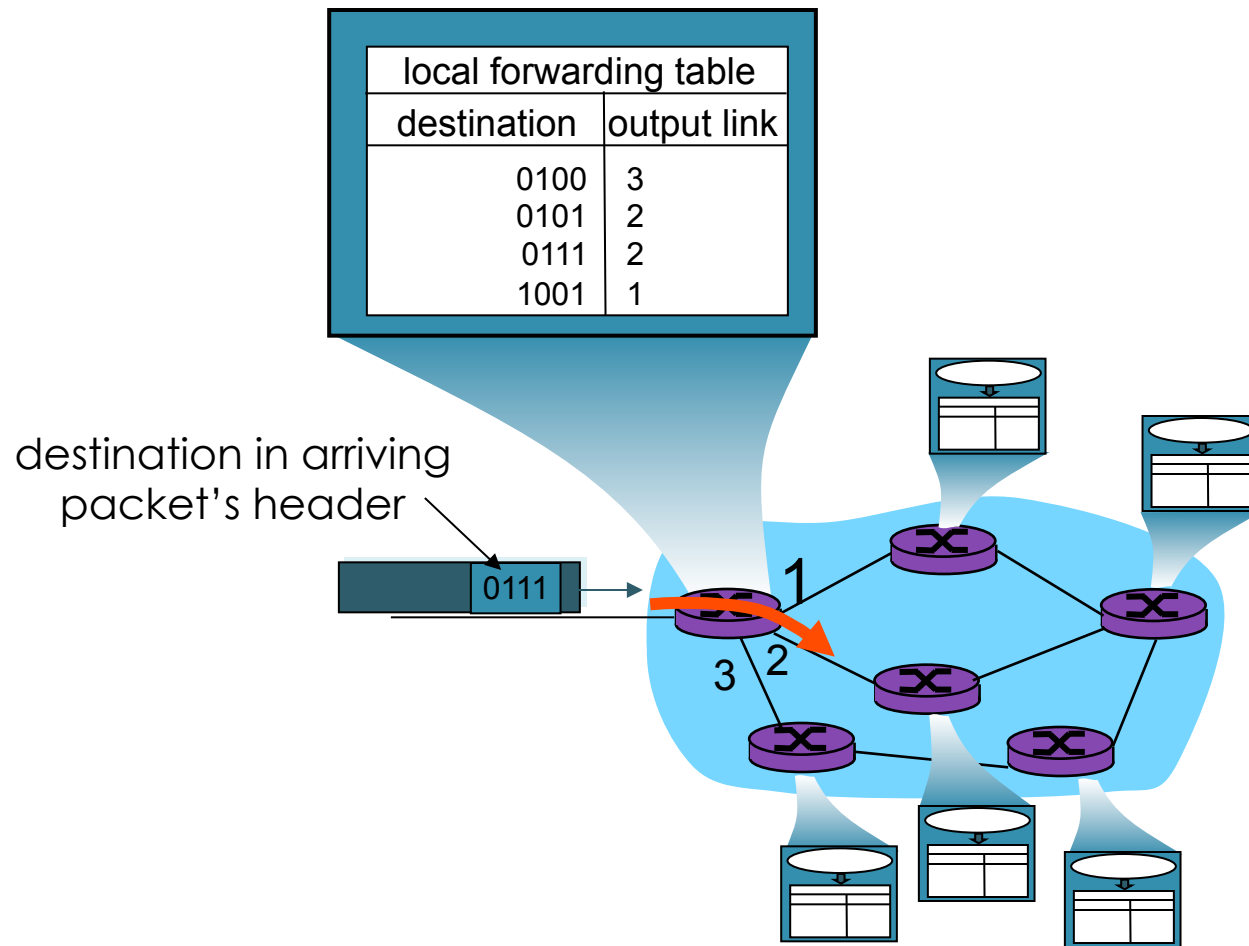
```
enum MessageType : uint8_t {RDT_CONN,  
                             RDT_CLOSE, RDT_ACK, RDT_DATA};
```

```
// ...
```

```
MessageType t = RDT_DATA;
```

```
if (t == RDT_ACK) // ...
```

Every router contains a forwarding table to determine output link for every packet.



The forwarding table uses lists of address ranges to reduce table size.

Destination Address Range	Link Interface
201.23.16.0 - 201.23.23.255	0
201.23.24.0 - 201.23.24.255	1
201.23.25.0 - 201.23.31.255	2
Otherwise	3

But what happens if ranges don't divide up so nicely?

Forwarding table uses **longest prefix matching** to select interface.

Destination Address Range	Link Interface
11001000 00010111 00010*** *****	0
11001000 00010111 00011000 *****	1
11001000 00010111 00011*** *****	2
Otherwise	3

Which interface will be used for the following IP addresses?

1. 11001000 00010111 00010110 10100001

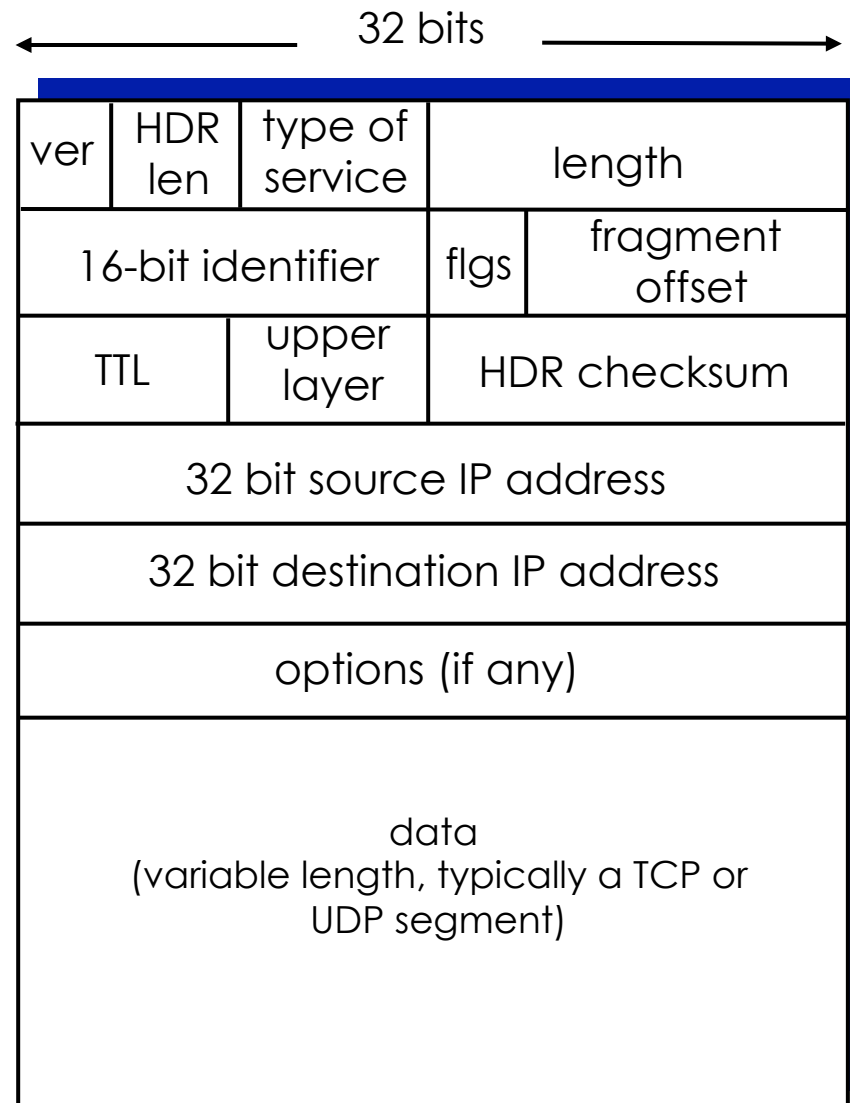
2. 11001000 00010111 00011000 10101010



Section 4.3

THE INTERNET PROTOCOL

Like TCP, IP has a complex header of at least 20 bytes.



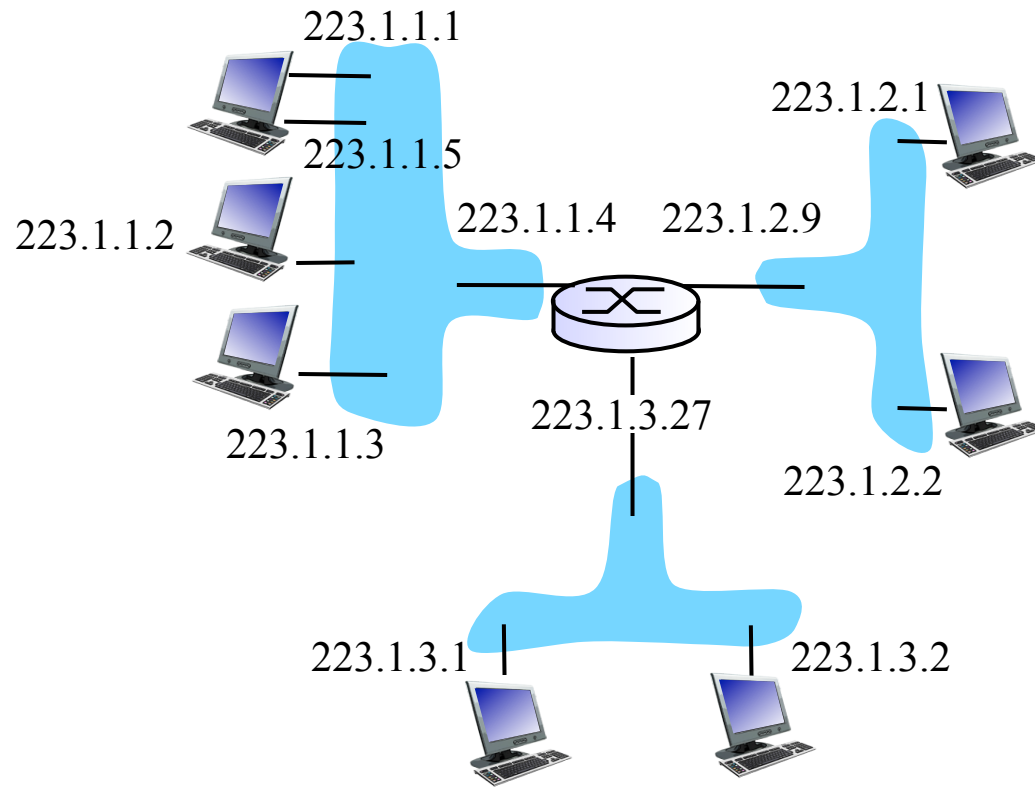
IPv4 addresses are 32-bit integers, usually written in dotted decimal format.

130.58.68.9

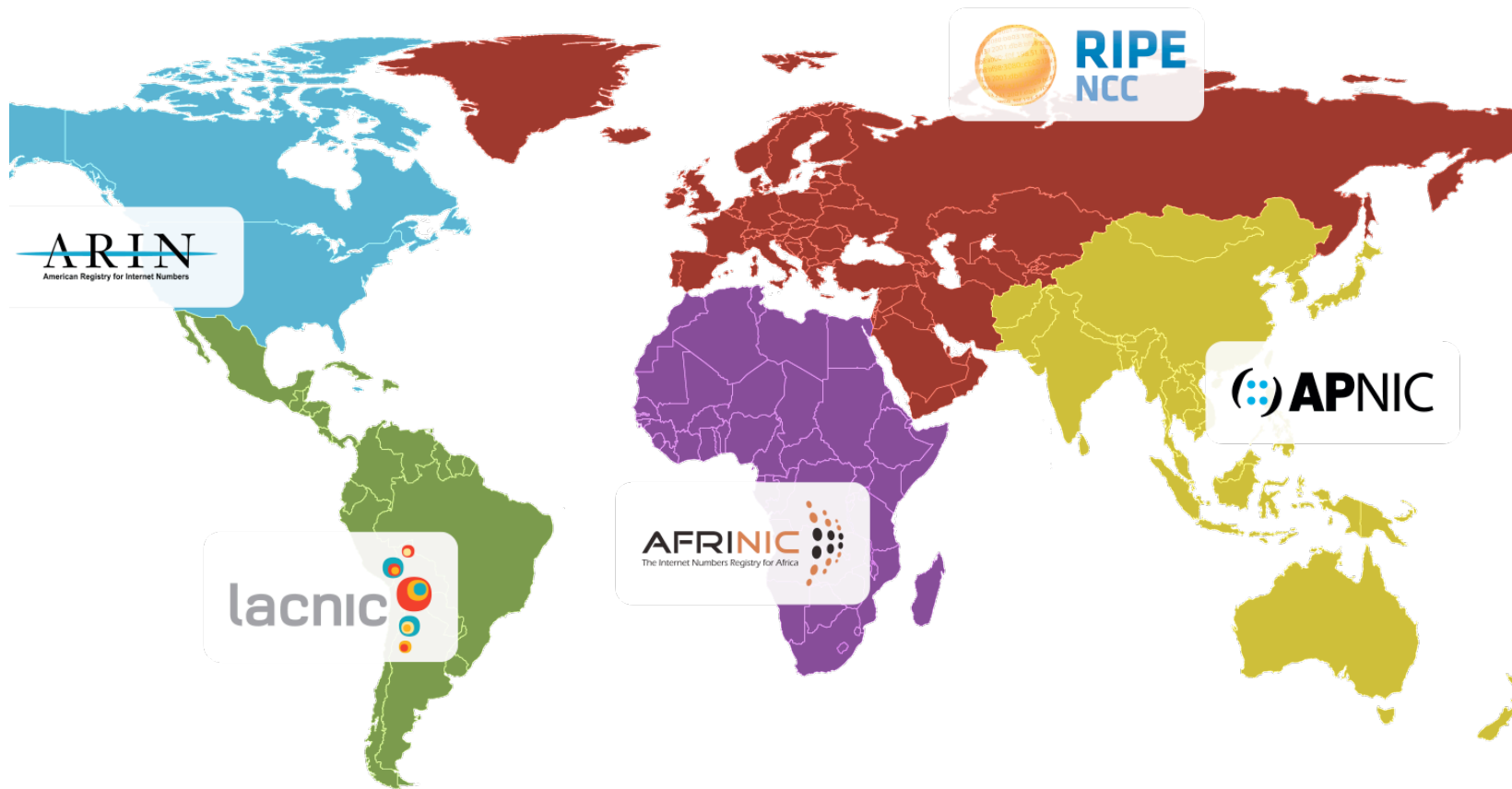


10000010 00111010 01000100 00001001

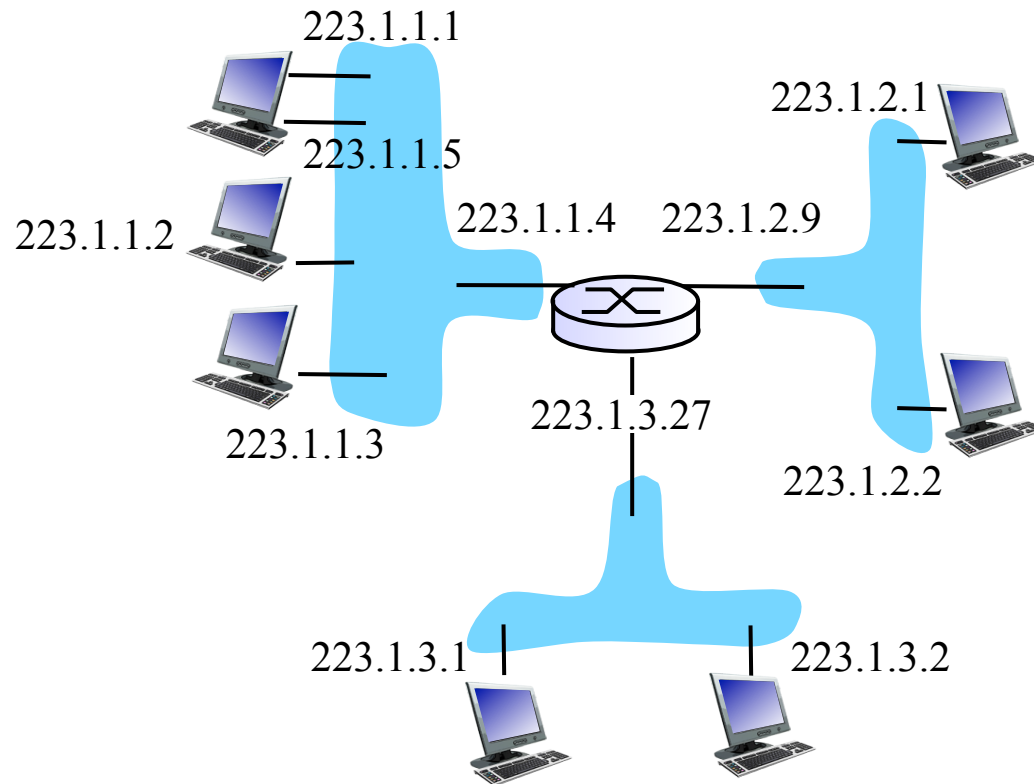
A physical interface is an addressable connection to a physical link.



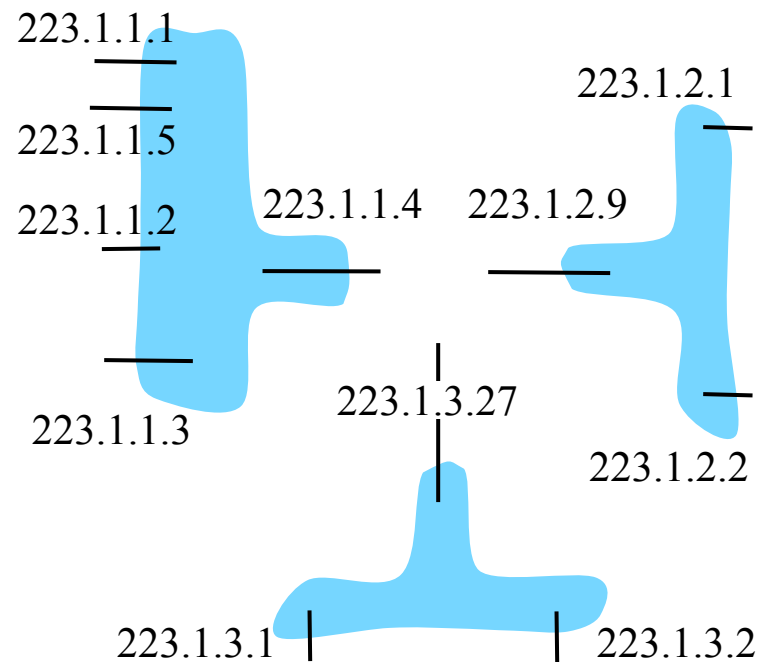
The IANA is in charge of assigning IP addresses to individuals/organizations.



We can divide network into **subnets**, each with a common prefix...



... which we can identify by detaching interfaces from hosts and routers.



Which of the following are **true** about subnets?

- A.** All hosts on a subnet use the same link layer protocol.
- B.** Hosts on the subnet use the router to communicate with each other.
- C.** Both A and B
- E.** Neither A nor B

Prefix lengths have become more flexible with switch to CIDR.

- **Classful Addressing**

- **Class A:** 8-bit prefix, 24 bits for hosts (16M)
- **Class B:** 16-bit prefix, 16 bits for hosts (64K)
- **Class C:** 24-bit prefix, 8 bits for hosts (256)

- **Classless Interdomain Routing (CIDR)**

- Prefix (subnet) length is no longer fixed

How many of the following are true about using CIDR instead of Classful Addressing?

1. It reduces the complexity of the hosts in the network.
2. It reduces the number of block allocations that need to be managed.
3. It better utilizes the IP address space.
4. It reduces the number of forwarding table entries.

A.	0
B.	1
C.	2
D.	3
E.	4