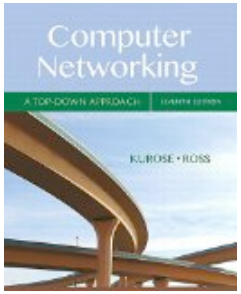
COMP 375: Lecture 27



- **News & Notes:**
  - Midterm #2 in class Friday
  - Project #4 due in one week
- **Reading (Wed, Apr. 11)**
  - Review previous reading

Section 4.3

THE INTERNET PROTOCOL

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

CIDR address blocks come with a **subnet mask**, which is written in one of two ways.

- Example subnet mask:

  11111111 11111111 11110000 00000000

  - **Dotted decimal**: 255.255.240.0
  - **Slash notation:** /20

IP addresses often include the prefix length slash notation, e.g. 130.74.128.0/20

How many unique, global IP addresses can we give out to hosts on our subnet?

Assuming that our subnet mask is 130.74.128.0/20.

A.	12
B.	20
C.	2^{12}
D.	2^{20}
E.	None of the above.

To broadcast to all hosts on a subnet, we can use a broadcast address.

- **Generic Broadcast:** 255.255.255.255

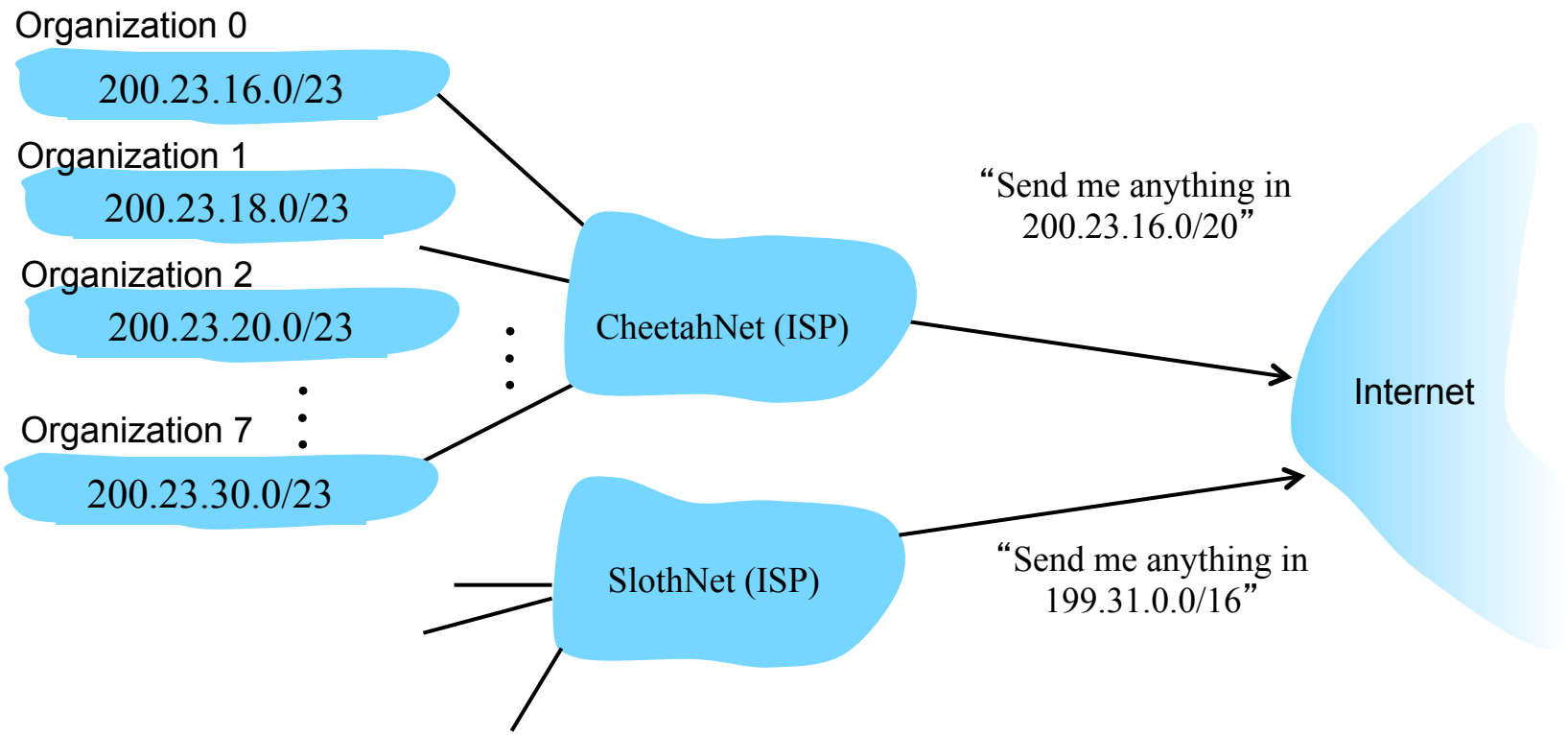
- **Subnet specific broadcast:**
  - (address | ~mask)

We can calculate the broadcast address for 230.8.1.3/18 as follows.

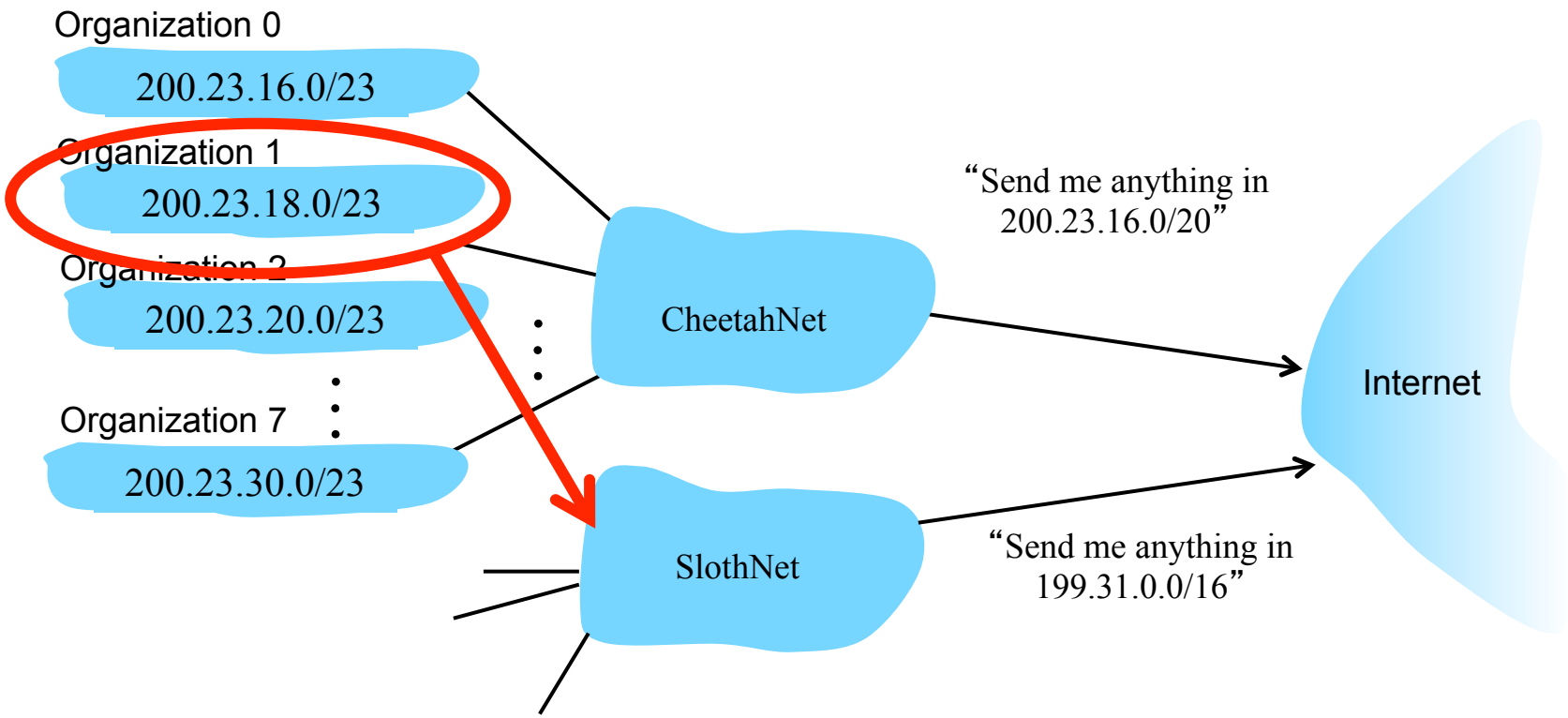
Host:	**11100110**	**00001000**	**00000001**	**00000011**
Mask:	**11111111**	**11111111**	**11000000**	**00000000**
~Mask:	**00000000**	**00000000**	**00111111**	**11111111**
Host | ~Mask	**11100110**	**00001000**	**00111111**	**11111111**

Broadcast address: 230.8.63.255

CIDR allows efficient advertisement of routing information.



What should we do if Organization 1 decides to switch to SlothNet?

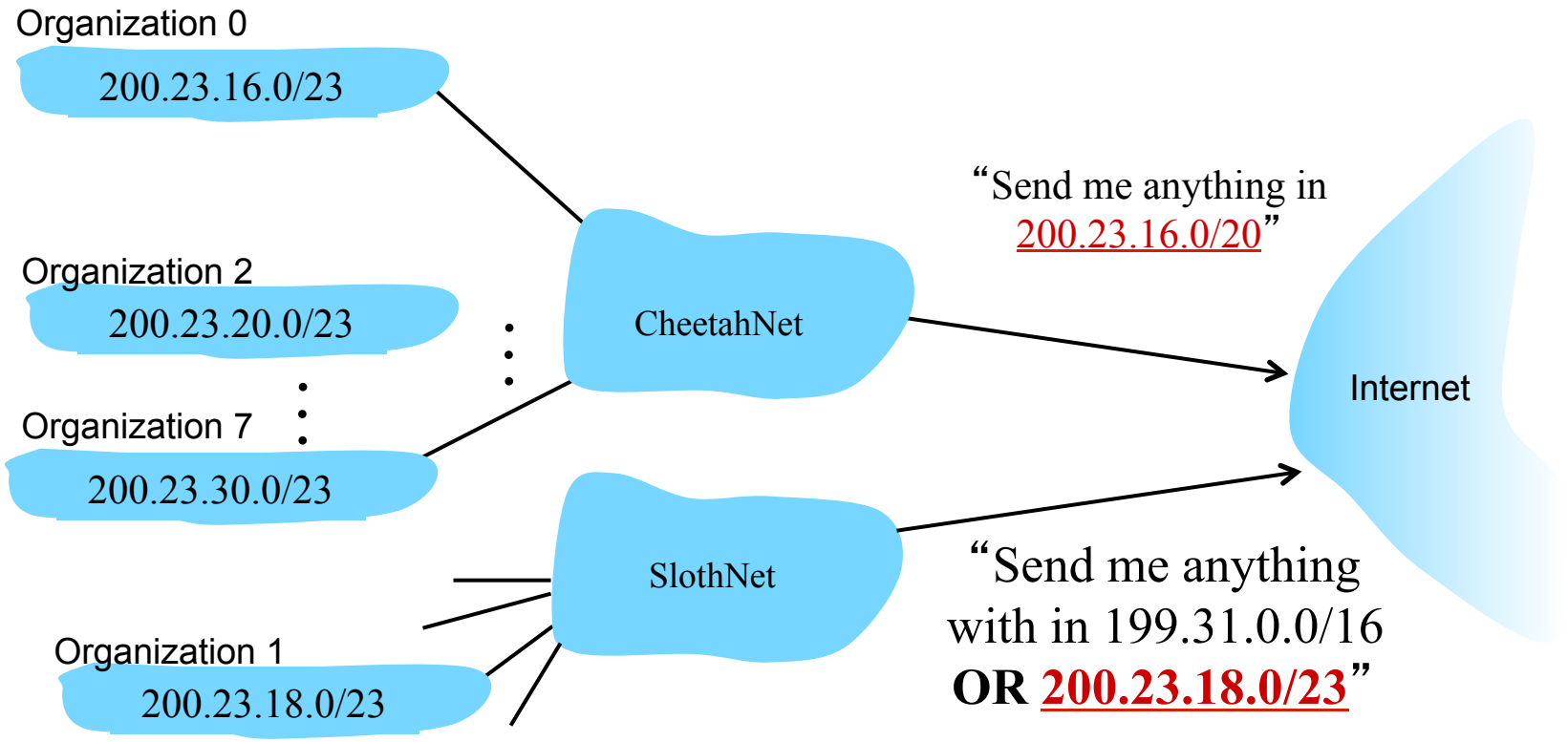


A. Move 200.23.18.0/23 to SlothNet and change what CheetahNet advertises.

B. Give Organization 1 a new subnet address.

C. Some other solution.

Longest prefix matching allows us to avoid forcing too many changes.



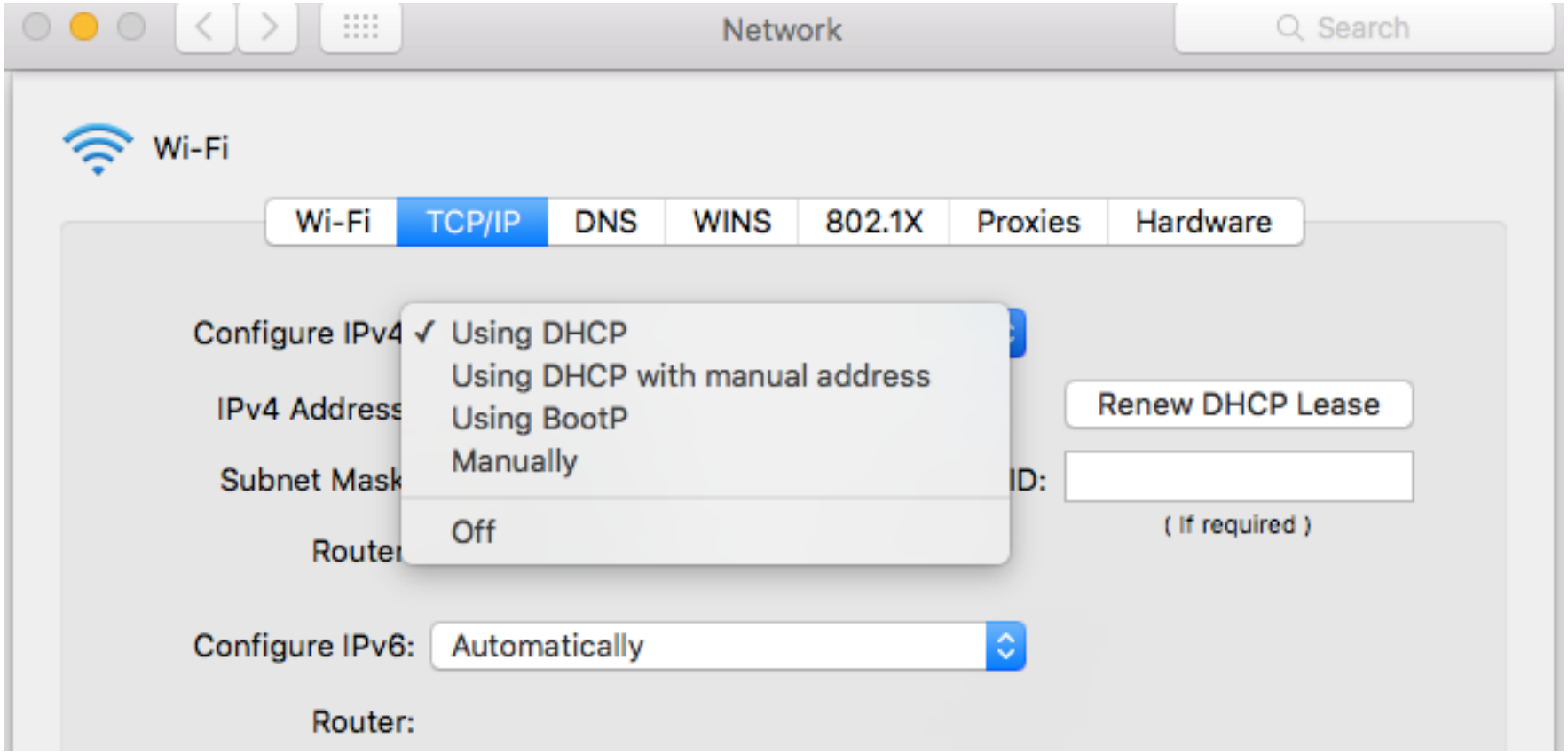
Forwarding Table Entries:

200.23.16.0/20: **11001000 00010111 0001****** ******** → Cheetah

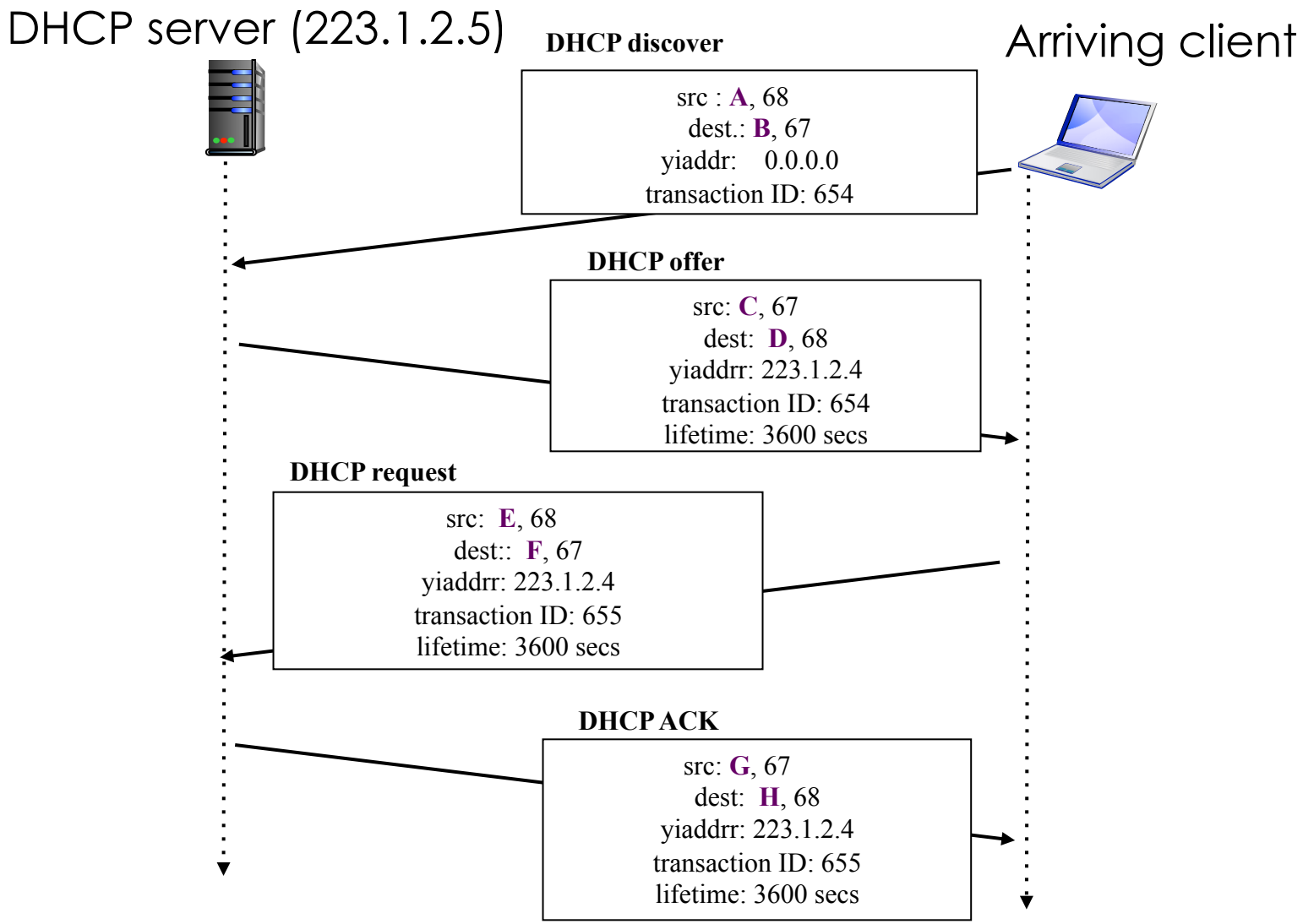
200.23.18.0/23: **11001000 00010111 00010010** ******** → Sloth

DHCP

Hosts on a network obtain an IP either statically or dynamically.



DHCP uses up to four steps to assign an IP address to a new client.



yiaddr: "your internet address"