

## Recitation 1: Group exercises

1. How does a bridge and a hub differ?
2. What fields should be in a link layer header (or trailer)?
3. How will a node know whether a received Ethernet frame contains, e.g., an IP packet, an ARP packet, or an IPX packet?
4. A link layer address can have many names, e.g., a MAC address. What other terms do you know about when referring to a link layer address?
5. IP address terminology, please explain!
  - unicast address
  - multicast address
  - broadcast address
  - limited broadcast address
  - (subnet) directed broadcast address
  - loopback address
  - network address
  - netmask
  - network prefix
  - prefix length

# 1. How does a bridge and a hub differ?

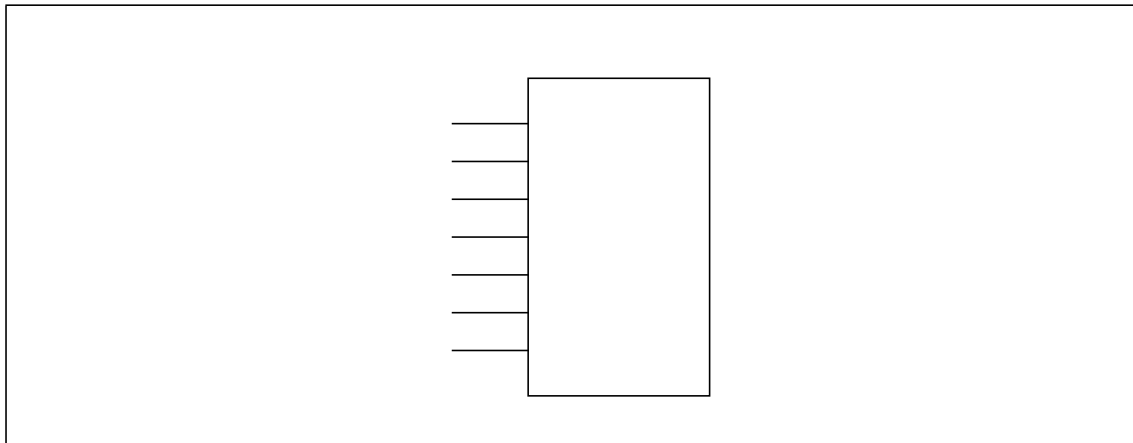
Some words/terms to assist you in the discussion

- broadcast domain
- collision domain
- store and forward
- multiple data rates
- multiple hops
- address learning, filtering

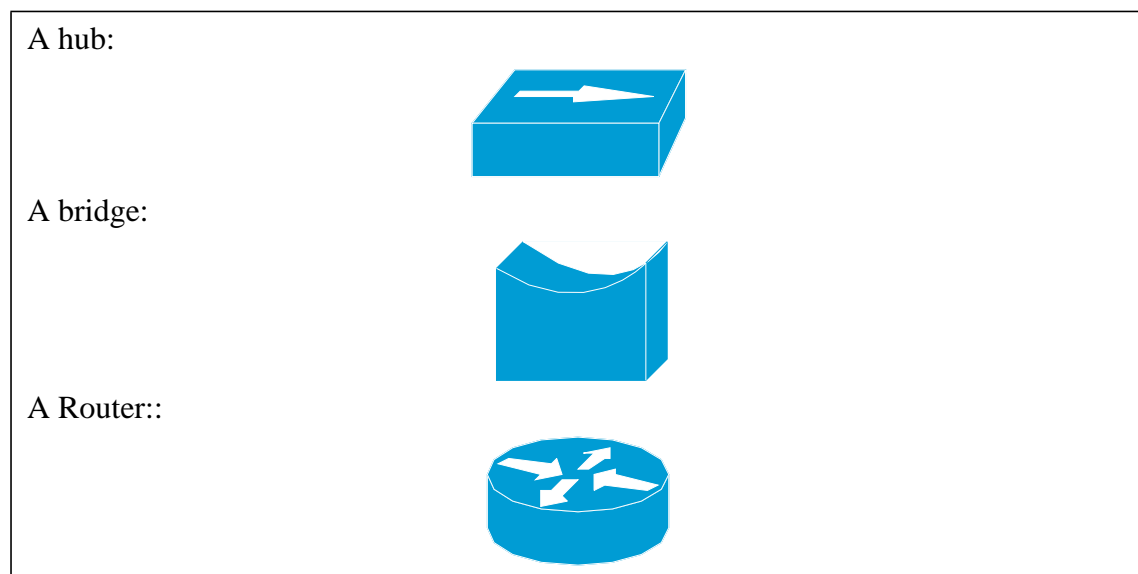
Additional words/terms to consider

- cut-thru forwarding
- arbitrary topologies (including loops)
- spanning tree protocol

**Table 1: Consider a black box with multiple ethernet ports**



**Table 2: Alternatives**



## 2. What fields should be in a link layer header (or trailer)?

Design your own link layer protocol format. State the name, length and order of the fields! Think freely!

Some hints:

- multiaccess or point-to-point?
- able to carry multiple or just a single higher layer protocol?
- How will the receiver know how long the packet is?
- Should you link detect bit errors? Even be able to correct them?
- Can the packet be forwarded by a layer-2 device hop count?
- (connectionless or connection-oriented)

**3. How will a node know whether a received Ethernet frame contains  
e.g., an IP packet, an ARP packet, or an IPX packet?**

Hint: Will Bob look into the layer-2 or layer-3 header to find out?

**4. A link layer address can have many names, e.g., a MAC address.**

What other terms do you use when referring to a link layer address?

## 5. IP address terminology, please explain!

- unicast address
- multicast address
- broadcast address
- limited broadcast address
- (subnet) directed broadcast address
- loopback address
- network address
- netmask
- network prefix
- prefix length

If you have time, discuss/explain these terms:

- private addresses
- public addresses
- anycast address