LIS565 Lecture 4

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Reading

Comer chapter 5–9

Tanenbaum, chapter 5

and thought of the week by Govanus

datagram and packet

IP datagrams contain header information and a data to be sent.

However, the datagram is not quite is sent by IP. IP datagrams are sent as packets. Each packet is sent according to the framing specifications of the underlying media.

The difference between datagram and packet comes from fragmentation.

Local vs remote delivery

If the IP address of source and destination are on the same network, then the IP system will deliver it directly.

Otherwise it delivers it to a gateway. The gateway has several IP addresses, one for each network that it is connected to.

local delivery: Adress Resolution Protocol

Since the delivery must be made using the local network hardware, the machines that sends the IP packet must discover the hardware address of the machine to deliver to.

This is done using the ARP.

Ethernet ARP

Since the IPv4 address in only 32 bit, it can not "grandfather" the MAC address.

Broadcast a special packet saying "hi, I have something to deliver to 231.112.123.23 what is your MAC address?" and only 231.112.123.23 will reply.

Between subnets, use routers and leave the broadcast to the local router of the destination

Why does it not broadcast the packet?

ARP Cache

To reduce the communications overhead created by ARP, hosts maintain a cache.

To accommodate for the “soft state”, hosts time out the data periodically.

To further reduce communication overhead

- ARP request contains the issueing machines MAC address.
- at one broadcast, all machines can update their cache
- when a machine boots it sends an ARP broadcast

Reverse ARP

does the reverse. It is mainly used by IP diskless machines that boot from the network, so it is not further discussed now.

In the usual case of a “full-blown” machine, DHCP is used. Fear not, you will hear about that later.