Routing and Supernetting

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Handling Datagrams

A datagram can arrive to a host, or a router.

Host

If datagram is for me, there are three possible reasons:

Unicast Meant for the host specifically.

Broadcast Meant for everyone.

Multicast Meant for a group of hosts.

If it's not for 'me', then drop it.

Router

If datagram is for 'me', accept it. If not for 'me', decrement TTL, if it reaches 0, drop it and send ICMP message. Otherwise, recompute checksum in IP header and then deliver it (either directly or indirectly).

Direct Router is directly connected to the destination.

Indirect Router has to forward the packet to another router.

Routing

Each router has a routing table, which maps from Network ID -> Router.

$$\left(\underbrace{N\left(I_x\right),}_{\text{network}} \ \underbrace{R_2}_{\text{next hop}} \right)$$

$$X \to Z \text{ typically doesn't change}$$
$$Z \to X \text{ sometimes changes}$$

Thus, every router doesn't need to know the entire network, just the next hop.

Supernetting

- Reduce size of routing tables

- Make routing easier

- Make 'big networks' have a single entry in the routing table