Arp - Address resolution protocol. Mapping of pysical and logical can be static or dynamic. ARP is dynamic, finds a physical address given a logical add. Broadcasts to all devices. Arp reply is unicast to host requesting map. Proxy Arp. router rep. hosts. when Arp seeks physical address, router sends its own add. ATMARP on ATM networks. binds physical add to ip add. Mapping table built w/ inverse request & reply. Can be divided into logical subnet.

ICMP - internet control mssg. protocol: unreliable/connectionless. Message encapsulated in ip datagram. 2 types: error-reporting, query-messaging. Error- problems that router or host may have w/ ip request query-done in pairs/specific info from router or host. 8bytes, type 1, code 1, checksum - 2, rest 4, rtt = rt - stt ft - sbt. tracert uses time exceeded & dest unreachable. ping uses echo request & reply. RIP, OSPF, BGP routing protocol, BGP - interdomain. based on path vectoring, 4 types open, update, keep alive, notific, RIP - intradomain. distance vector routing, each router shares all info about AS ospf - divides AS into areas of networks hosts routers. link state routing count to infinity - redefine as 16. split horizon - leave out info in routing table, reverse position - include info but set distance to ∞. Multicasting sending message to more than 1 person. 224.0.0.0/4. internet group management protocol collects local group info. under multicast Header, transport layer - defines processes w/ port number. 0-1024 - well known 1024-49151 - registerd 49152-65535 - dynamic/private, ephemeral. simple protocol (UDP) just send data. no window size or awk. stop-n-wait (UDP w/ own awk) send window size of 1, recieve window size 1. Before we can send more, need awk. Go back N (TCP) - s = (2^n) - 1; n = size of sequence, selective repeat (TCP) send window 2^(n-1). r = 2^(n-1). n = size of sequence.

Autonomous system

Udp- transport layer, single short message w/ single short response built in awk with how its built. 8 bytes, source port 2 bytes dest port 2 bytes. length 2 bytes, checksum 2 bytes. (may be 0's) process to process. unrelable connectionless. error control in checksum package - control block table, control block module, input que, input module output module.

Tcp- 20-60 bytes. source port 2 bytes. Dest Port 2 bytes. sequence num. AWK num, Header length (4-bits), flags (6-bit), syn, starting sequence number. syntawk-sent from reciever. ACK-which byte we are expecting next. Fin-close a connection (either side can send). Half open Half closed. Rst- refuse a connection. Urg-urgent pointer (different data). Phs-sends immediatley, Optional, mayor may not work. Process to process full Duplex connection oriented. connection est. 3-way-handshake. connection term. 3-4 way handshake. window size-rwnd or cwnd (smaller one) opened or closed by reciever. Timer- RTT, keep alive timer. Time wait (How long to keep open). Error control-checksum. awk, timeouts. Flow control. congestion control. slow start size of congestinon window increases exponentially until threshhold. congestion Avoidance size of congestion window increases till congestion detected. SCTP- message oriented reliable, connection oriented.