

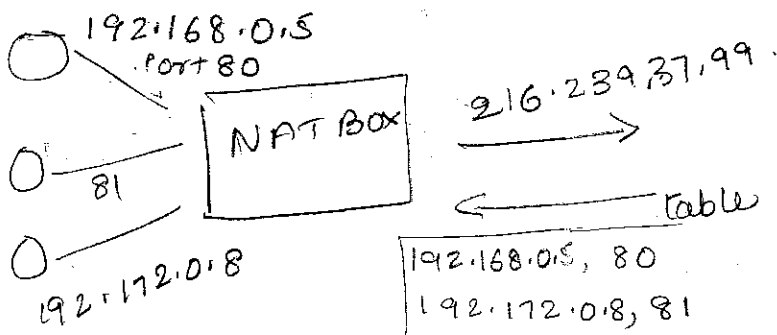
Part # 1

Network address translation allows multiple computers on an internal network to share a single external IP.

1) when a packet leaves the internal network the NAT box translates the source IP and port.

2) It keeps a table of int IP, int port, ext port.

3) when an external packet arrives, NAT box looks in the table and translates back to int IP and port.

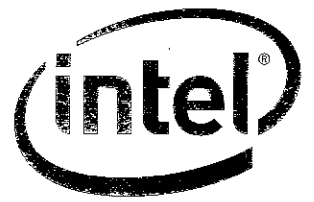


internal IP	Internal Port	Ext Port
192.168.0.5	81	81
192.172.0.8	81	8②

(2) The protocol that is used by the internet to find a MAC address given an IP address is ARP (Address Resolution Protocols).

When Machine A wants to send to Machine B, it broadcasts Machine B's IP address. Then Machine B responds with MAC address. Machine A then sends its IP & MAC address with its initial frame. This information is cached to prevent having to run the ARP run over & over again.

If 2 m/c's live on different ethernet's, the initial broadcast will be responded to usually by a router which does a proxy ARP. Alternatively, Host A might realize the traffic is on a different ethernet & then send to a default address.



③ In OSPF, the interarea routes are calculated by computing using only link state.

Interarea routes are computed in 3 steps:
compute source to backbone;
backbone to destination area,
destination area to final destination.

Two routers are adjacent if they are on the same LAN and one is designated router. Only adjacent routers exchange information.

④ Routing Algorithm is used by BGP?

Border Gateway Protocol. routers communicate first by establish a TCP connection. It uses essentially a distance vector protocol, where it also keeps

track of the path used instead of just the outgoing line. The line would not be used if it does not meet the criterion, ²

7

The 8 byte U.D.P. header

Source Port	Destination Port
UDP Length	UDP checksum

UDP Provides:

- Source Port
- Destination Port

S: 220 xyz.com
8. C: HELO abcd.com
S: 250 Hello ~~abcd.com~~, pleased to meet you.
C: MAIL FROM: joe@abcd.com
S: 250 joe@abcd.com
C: RCPT TO: jill@xyz.com
S: 250 jill@xyz.com.
C: DATA
S: 354
C: Blah Blah Blah
C:
S: 250
C: QUIT
S: 221 xyz.com closing connection

9) - App program ^(client) calls the resolver.
- UDP packet sent to port 53 on the DNS server to resolve.

- DNS server sends back the IP address it had mapped back to the ~~to~~ sender's port.

- Client app then uses the IP address & establishes a TCP connection to the remote server.

- If DNS can't find the address, then it sends a probable DNS server from its root down to the client to retransmit the same UDP ~~packet~~ packet.

Problem 10
not on test