NAT – only changes IP addresses (modifies layer 3 header)

Dynamic – the device chooses the final POST translation attributes

Dynamic NAT – the administrator defines the PRE and POST translations (IP address translations), but the device will choose the mapping between PRE and POST translation IP’s.

Dynamic NATs are very similar to dynamic PATs, the difference is that dynamic NATs the ports are not translated, only the IP addresses are translated, this means that we cannot share a single IP address among multiple devices. Every device will have its own IP address for the duration of the dynamic NAT translation.

A screenshot of a computer

AI-generated content may be incorrect.

We can see that the router says that any IP address within the 10.7.7.0/24 network will share the IP addresses 54.5.4.1 through 54.5.4.3. The router will also keep track of the translations that it makes in a router translation table. Firstly, host A sends a packet and since this is a NAT, the IP address are changed, the ports are not changed. So, the SRC IP address:Port 10./7.7.71:1111 gets translated into 54.5.4.1:1111, as we can see host A is using the first IP address available, the only remaining ones left are 54.5.4.2 and 54.5.4.3. For the duration of this connection, host A owns that translated IP address. As we can see the ports did not get translated.

Then host B sends a packet with the SRC IP address:Port of 10.7.7.72:2222, this gets translated into the second available translated IP address which is 54.5.4.2:2222, the port does not change. For the duration of this connection, host B owns that translated IP address.

Then host C sends a packet with the SRC IP address:Port of 10.7.7.73:3333 which gets translated to the last available IP address which is 54.5.4.3:3333, the port does not change. For the duration of this connection, host C owns this translated IP address.

Now all 3 hosts have used the 3 IP addresses in the dynamic NAT pool. So now when host D tries to send a packet, there are no IP addresses available for host D to use because all 3 IP addresses are used, so host D’s packet will be dropped, and it will have no connectivity to the internet.

A diagram of a diagram

AI-generated content may be incorrect.

At some point in time host A will finish its connection and the translated IP address that host A was using will be released and be available to use in the pool.

A diagram of a translation

AI-generated content may be incorrect.

So now when host D tries to send a packet, its SRC IP address will be translated to the 54.5.4.1 public IP address and it will have connectivity to the internet, and it will own that IP address for the duration of the connection:

A computer screen shot of a diagram

AI-generated content may be incorrect.

So now all 3 IP addresses are in use meaning that if host A tries to send a packet, there are no available IP addresses to assign to host A, meaning that host A’s packet will be dropped.

A diagram of a diagram

AI-generated content may be incorrect.

Dynamic NATs are rarely used in the industry, the other 3 (static NAT, static PAT, dynamic PAT) are used.

Dynamic NAT is bidirectional while the connection is active, for example when host B got assigned the 54.5.4.2 IP address, for the duration of that connection, other hosts can send data to that IP address and host B would receive it.

A use case for dynamic NAT is to build what is known as a lazy static NAT. If you had 20 inside hosts and each host had to be translated to its own public IP address, then you could use a dynamic NAT to do it for you, there has to be an IP address available for each host though, in our diagram there were 4 hosts and only 3 IP addresses.

Disadvantages of dynamic NAT:

* Non-deterministic IP assignments, if host C gets the IP address 54.5.4.3, there is no guarantee that it will keep it in the future
* Inconsistent connectivity