NAT – only change IP addresses (modifies the layer 3 header)

Static – administrator specifically defines PRE and POST mapping

So then static NAT would be the explicit mapping between an IP address to another IP address. The goal of static NAT is to make internal resources externally accessible.

A green object with white dots

AI-generated content may be incorrect.

Here we have an internal host with the IP address of 10.2.2.33, we also have an external host somewhere on the internet, if this is all we have, when the external host tries to send a packet with a DST IP address of 10.2.2.23, the packet will be dropped on the internet because the only communication that can work on the internet is public IP’s to public IP’s, since the DST IP address is a private IP address, it will be dropped.

However, if I have a host in the inside network that I want to be accessed externally, I will have to configure my router to a static translation to make my internal host be accessible externally.

A green circle with arrows and a blue label

AI-generated content may be incorrect.

So now the router will translate the IP address 10.2.2.23 into 73.8.2.23.

A screen shot of a computer

AI-generated content may be incorrect.

Now if the external host has the DST IP address of 73.8.2.33, when the router receives it, it will un-translate it back into 10.2.2.33 and the host in the inside network will receive it and respond.

Let’s unpack it a bit further.

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When the packet (from external host) reaches the router, the router will translate the DST IP address according to the configuration to 10.2.2.23. It didn’t have to make any decisions, it simply looked at the configuration and translated:

A green circle with arrows and numbers

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Now when the internal host receives the packet, it is able to send a response, the DST IP address will be the source of the packet it had received, and the SRC IP address will be the DST of the packet it has received:

A computer screen shot of a green circle

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When the response packet crosses the router, the router will see that the SRC IP address has a static NAT mapping so it will translate it into 73.8.8.23:

A green circular object with arrows and numbers

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3 key information:

* Inbound packet (packet from external host to inside internal host): destination is translated.
* Outbound packet (packet from inside internal host to external host): source is translated.
* Static NATs are bidirectional, meaning it doesn’t matter which host initiated the communication, the translation will still work.

Static NAT does not conserve any IP addresses, if we had another inside internal host with lets say the IP address 10.2.2.34, we would need to configure another static NAT mapping for it in the router so for example 10.2.2.34--->73.8.2.34. this would apply for all hosts inside the internal network. The goal of the static NAT is to make internal resources (hosts) accessible externally.