The types of network addresses translation (NAT):

* Static NAT
* Static PAT
* Dynamic PAT
* Dynamic NAT

NAT vs PAT:

Every packet contains a data payload, a layer 4 header and a layer 3 header:

A colorful rectangular sign with numbers and text

AI-generated content may be incorrect.

The layer 3 header has the SRC IP address and the DST IP address, the layer 4 header has the TCP header and the SRC port and DST port.

A circular object with a pink line

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When the packet passes through the router and the only thing that changes is the layer 3 address, this is known as NAT.

If a packet is being translated and only the layer 3 header is translated, this is a NAT.

However, if the packet passes through the router and both the port and IP address change, this is known as a PAT (port address translation):

A black circular object with a pink line

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NAT – network address translation, only modifies the layer 3 header

PAT – port address translation, modifies both the layer 3 and layer 4 header.

Static vs Dynamic:

* Static: explicit mapping between pre-translation and post-translation.
* Dynamic: pre-translation attributes defined by admin, post-translation attributes selected by device.

Let’s explore static translation:

A computer icons and numbers

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The router will be our translation device.



An example would be if we configured out router to translate 10.6.6.61 (which is host A’s IP address) to 72.9.4.11. This means that whenever host A sends packets to the internet, when the packet crosses the router, the router will replace the SRC IP address which is host A’s IP address with 72.9.4.11. When traffic gets returned to host A, the router will do the opposite and replace the IP address 72.9.4.11 with host A’s IP address which is 10.6.6.61.

Dynamic translation:

A computer icons and numbers

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A blue rectangle with black text

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The example is that we configure the router to translate anything in the 10.6.6.0/24 network to one of these 3 IP addresses. For example, when host A sends a packet to the internet, when it crosses the router, host A might receive from the router the IP address 72.9.4.22, then when host B sends data to the internet and it crosses the router, host B might receive from the router the IP address 72.9.4.24. Then when host C sends a packet to the internet and it crosses the router, host C may receive from the router the IP address 72.9.4.23.

Even though the admin defined the pre translation attributes and what its being translated to, the device makes the decision of which host gets which IP address. Since the device had to make that decision, this is known as a dynamic translation.