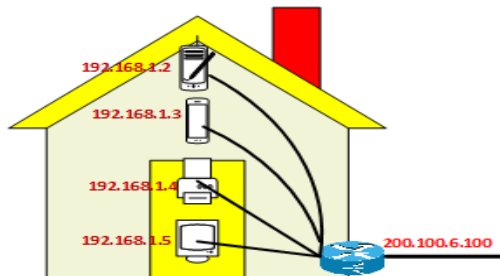


NAT on Cisco Router:

- o NAT is a Cisco term which stands for Network Address Translation.
- o NAT is a process that involves translating Private IP into Public IP addresses.
- o The process of translating one IP address to another is known as a NAT.
- o Router and Firewall is a device, which is used for network Address Translation.
- o There are many forms and kinds of Network Address Translation (NAT).
- o Network Address Translation used to reduce requirement of the Public IP address.
- o Network Address Translation increase security of Internal Computer Networks.
- o NAT Translate Private IP into Public IP address & Public IP into Private IP address.
- o NAT used to connect a device with Private IP address to the Internet or WAN.
- o Network Address Translation hide an organization internal network from external.
- o Network Address Translation (NAT) modifies only the Layer 3 header of IP address.
- o PAT, translation of an IP address and Port to another IP address and Port number.
- o Port Address Translation (PAT) modifies both the Layer 3 and Layer 4 header of IP.



NAT:

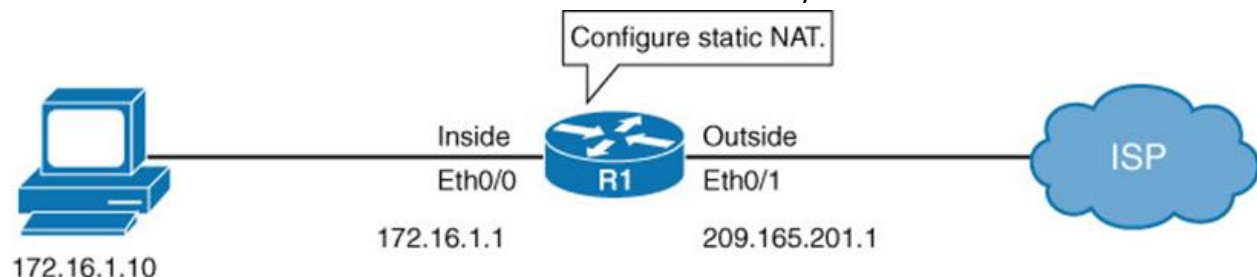
Network Address Translation, or NAT, implies a translation of an IP address to another IP address. Network Address Translation (NAT) modifies only the Layer 3 header of IP.

PAT:

Port Address Translation, or PAT, implies a translation of an IP address and Port to another IP address and Port. PAT modifies both the Layer 3 and Layer 4 header. PAT as a subset of NAT.

Static vs Dynamic:

Both a NAT and a PAT can exist in two forms: Static NAT or Dynamic NAT.



Static NAT:

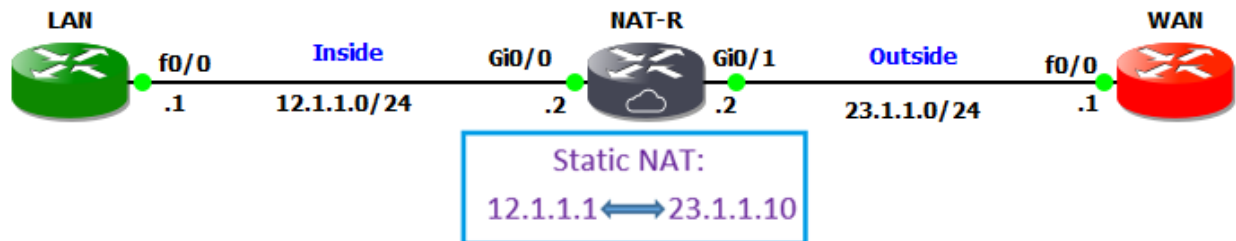
A Static mapping is sometimes referred to as a One-to-One translation. Static NAT translation is bidirectional. Whether the internal host or the external host sent the first packet, it would “pass through” the Static NAT. Static NAT is used to do a one-to-one mapping between an inside address and an outside address. Static NAT also allows connections from an outside host to an inside host.

Dynamic NAT:

A Dynamic mapping is sometimes referred to as a One-to-Many– implying that in a Dynamic translation, many addresses can appear as one. Dynamic NAT is used when you have a “pool” of public IP addresses that you want to assign to your internal hosts dynamically.

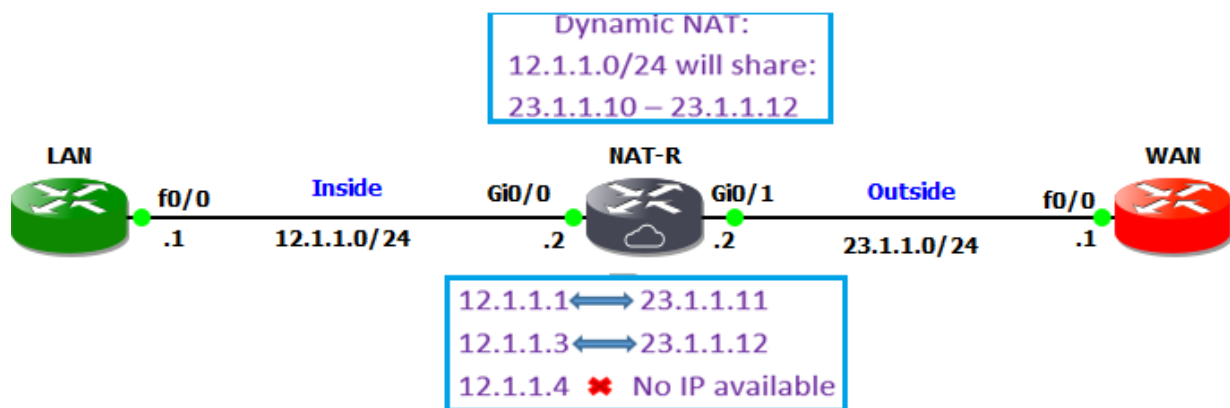
Static NAT:

Static NAT implies a translation of single IP address to another single IP address. Static NAT modifies only the L3 header. Static NAT is useful when a network device inside a private network needs to be accessible from internet.



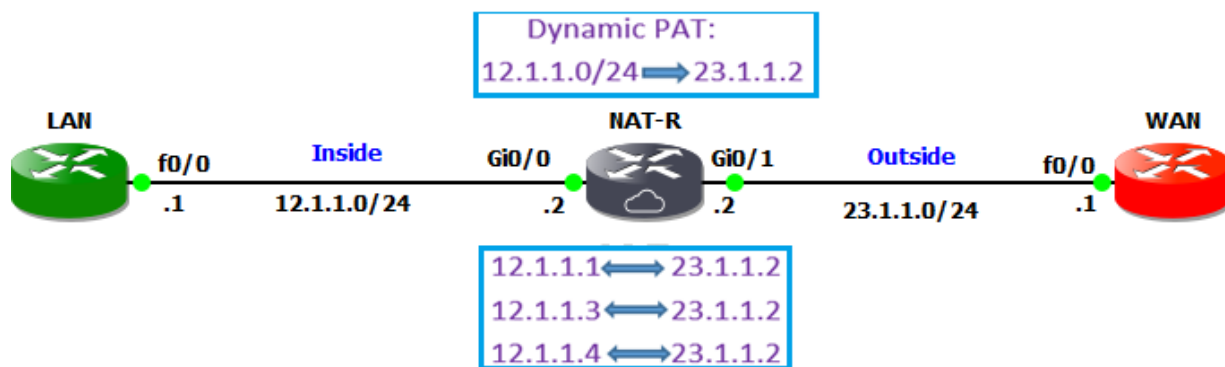
Dynamic NAT:

Translation of just the IP address, where the device determines the new IP address after translation. Dynamic NAT can be defined as mapping of a private IP address to a public IP address from a group of public IP addresses called as NAT Pool.



PAT (Port Address Translation):

PAT is another type of dynamic NAT, which can map multiple private IP addresses to a single public IP address by using a technology known as Port Address Translation. When a client from inside network communicate to a host in the internet, the router changes the source port number with another port number. These port mappings are kept in a table. When the router receives data packet from internet, it will refer the table, which keep the port mappings and forward the data packet to the original sender.



Inside Local Address:

Inside local address is an IP address assigned to a workstation inside our network. Inside Local addresses are typically private IP addresses, which stay inside our network.

Inside Global Address:

Inside Global address are typically public IP addresses which are assigned to our end internet facing router to be used as the IP address for communicating with other devices in the internet. The Inside Local IP addresses are removed at the NAT router and translated with Inside Global address.

Outside Global Address:

Outside Global address is the public IP address assigned to the end device on the other network to communicate other devices in the internet. Outside Global addresses are public IP addresses which are routable.

Outside Local Address:

Outside local address is the real IP address of the end device at other network. Outside local addresses are typically private IP addresses assigned to the computers in the other private network. We cannot know the Outside local addresses because in a NAT enabled network we use the destination IP address as Outside Global address.

