BRYANT CCNA 15 - NAT and PAT

SEC 15.1 NAT & PAT

Network Address Translation takes a host's private IP address and translates it to a non-private, routable address.

As a review, the private IP Ranges (RFC 1918):

Class A - 10.0.0.0/8
Class B - 172.16.0.0/12 (not 16)
Class C - 192.168.0.0/16 (not /24) } note!

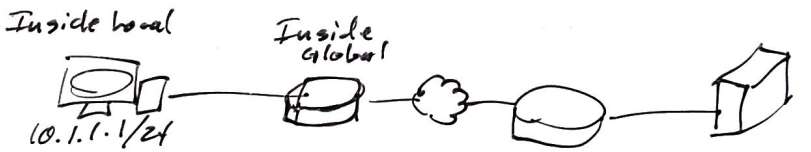
The only slightly tricky thing about NAT is the names given to addresses in the process:

Inside local - the address being translated locally

Inside global - the address the inside local address is translated to.

Outside Local are the non-routable addresses of hosts on a remote network

Outside global are addresses that are routable on a remote network.

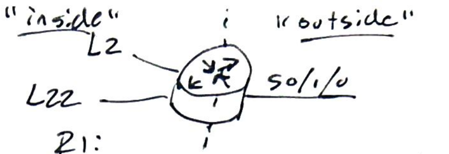


From an outside perspective, these addresses would be outside.

When a router performs Nat, it creates a map from inside local addresses to global inside addresses. Packets from the iside local address are translated on their way out, and incoming packets are also translated.

SEC 15.2 Static Nat

If you only have a limited number of hosts, or have a server that can't use a dynamic address, you can use static NAT. SNAT is a one-to-one mapping of inside local to inside global addresses.



R1:
S0/1/0 : 172.12.123.1/24
L2 : 10.1.1.2/32
L22: 10.1.1.22/32

In this network we'd have 2 mappings for SNAT. But, before creating the mappings it is strongly recommended to configure the required 'ip nat inside' and 'ip nat outside' interfaces. Otherwise it is hard to troubleshoot if you forgot these.

ip nat inside goes on the interface closest to the hosts you want having their addresses translated.

ip nat outside goes on the interface the router performing NAT uses as an exit interface.

```
R1(config)# int L1
R1(config-if)# ip nat inside
             # int L2
             # ip nat inside
             # int S0/1/0
             # ip nat outside
```

} configure interfaces (first)

assign snat addresses:

```
R1(config)# ip nat inside source static 10.1.1.2 200.1.1.1
   "          "     "       "    10.1.1.22 200.1.1.2
```

verify:

```
R1# show ip nat translation
```

The problem is that you need a routable IP for each host to use this, and also that static configs are always a problem for scalability.

NOTE: to test this lab I added R2 @ 172.12.123.1 and set an ip route for 200.1.1.0/24 on R2 with a next hop at R1. Then packet debugging on pings.

SEC 15.3 Dynamic NAT Lab

with the same interface setup, but all NAT config removed...

1.) setup nat inside/outside (same as above)
2.) create ACL that identifies hosts that can use NAT
3.) write IP Nat inside statement that references it and the pool
4.) create a pool

create pool:

```
R1(config)# ip nat pool CCNA 200.1.1.1 200.1.1.5 \
                netmask 255.255.255.0
```

Create access list:

```
R1(config)# access-list 2 permit host 10.1.1.2
  "           "         2 permit host 10.1.1.22
```

Setup NAT:

```
R1(config)# ip nat inside source list 2 pool CCNA
```

If, for some reason, you want to clear the Nat Pool, you can run

```
R1# clear ip NAT trans *
```

SEC 15.3 Port Address Translation

Generally referred to as "overloading", PAT allows the private IP addresses of inside hosts to be translated to a single routable address – that already in use on the outside interface!

Lab:

1.) create ACL
2.) ip nat inside/outside
3.) turn on PAT

```
R1(config)# ip nat inside source list 2 interface serial 0/1/0 \
                overload
```