**Table of Contents**

1. **PAT Scenario Overview**
   * 1.1 Inside and Outside Networks
   * 1.2 NAT Table Explanation
2. **Configuring PAT with a Single IPv4 Address**
   * 2.1 Configuration Commands
   * 2.2 Example Setup
3. **Configuring PAT with an Address Pool**
   * 3.1 Configuration Commands
   * 3.2 Example Setup
4. **Analyzing PAT - PC to Server Communication**
   * 4.1 Communication Flow
   * 4.2 NAT Table Analysis
5. **Analyzing PAT - Server to PC Communication**
   * 5.1 Return Traffic Analysis
   * 5.2 NAT Table Analysis
6. **Verifying PAT Configuration**
   * 6.1 Verifying Translation Entries
   * 6.2 NAT Statistics

**1. PAT Scenario Overview**

**1.1 Inside and Outside Networks**

* **Inside Network:** Two PCs (PC1 with IP 192.168.10.10 and PC2 with IP 192.168.11.10) are connected to Router R1.
* **Outside Network:** Router R2 connects to the internet with servers Svr1 (IP 209.165.201.1) and Svr2 (IP 209.165.202.129).

**1.2 NAT Table Explanation**

* **NAT Table Columns:**
  + Inside Local Address
  + Inside Global Address
  + Outside Local Address
  + Outside Global Address
* **Example NAT Entries:**
  + PC1: 192.168.10.10:1444 → 209.165.200.225:1444 → 209.165.201.1:80
  + PC2: 192.168.11.10:1444 → 209.165.200.225:1445 → 209.165.202.129:80

**2. Configuring PAT with a Single IPv4 Address**

**2.1 Configuration Commands**

* Use the following commands to configure PAT using a single IPv4 address with the overload option:

R2(config)# ip nat inside source list 1 interface serial 0/1/1 overload

R2(config)# access-list 1 permit 192.168.0.0 0.0.255.255

R2(config)# interface serial0/1/0

R2(config-if)# ip nat inside

R2(config-if)# exit

R2(config)# interface Serial0/1/1

R2(config-if)# ip nat outside

**2.2 Example Setup**

* **Scenario:** All traffic from the 192.168.0.0/16 network is translated to a single public IP (209.165.200.225) on Router R2’s Serial 0/1/1 interface.

**3. Configuring PAT with an Address Pool**

**3.1 Configuration Commands**

* Configure PAT with a pool of public addresses using the following commands:

R2(config)# ip nat pool NAT-POOL2 209.165.200.226 209.165.200.240 netmask 255.255.255.224

R2(config)# access-list 1 permit 192.168.0.0 0.0.255.255

R2(config)# ip nat inside source list 1 pool NAT-POOL2 overload

R2(config)# interface serial0/1/0

R2(config-if)# ip nat inside

R2(config-if)# exit

R2(config)# interface serial0/1/1

R2(config-if)# ip nat outside

**3.2 Example Setup**

* **Scenario:** The network 192.168.0.0/16 uses a pool of addresses from 209.165.200.226 to 209.165.200.240 for NAT, with overload enabled.

**4. Analyzing PAT - PC to Server Communication**

**4.1 Communication Flow**

* **PC1 to Svr1:** Source IP 192.168.10.10, port 1444 is translated to 209.165.200.225:1444.
* **PC2 to Svr2:** Source IP 192.168.11.10, port 1444 is translated to 209.165.200.225:1445.

**4.2 NAT Table Analysis**

* **Entry for PC1:** 192.168.10.10:1444 → 209.165.200.225:1444 → 209.165.201.1:80
* **Entry for PC2:** 192.168.11.10:1444 → 209.165.200.225:1445 → 209.165.202.129:80

**5. Analyzing PAT - Server to PC Communication**

**5.1 Return Traffic Analysis**

* **Svr1 to PC1:** 209.165.201.1 → 209.165.200.225:1444 → 192.168.10.10:1444
* **Svr2 to PC2:** 209.165.202.129 → 209.165.200.225:1445 → 192.168.11.10:1444

**5.2 NAT Table Analysis**

* **Entry for Svr1:** 209.165.201.1 → 209.165.200.225:1444 → 192.168.10.10:1444
* **Entry for Svr2:** 209.165.202.129 → 209.165.200.225:1445 → 192.168.11.10:1444

**6. Verifying PAT Configuration**

**6.1 Verifying Translation Entries**

* **Command:** show ip nat translations
* **Output:**

Pro Inside global Inside local Outside local Outside global

tcp 209.165.200.225:1444 192.168.10.10:1444 209.165.201.1:80 209.165.201.1:80

tcp 209.165.200.225:1445 192.168.11.10:1444 209.165.202.129:80 209.165.202.129:80

**6.2 NAT Statistics**

* **Command:** show ip nat statistics
* **Output:**

Total active translations: 4 (0 static, 2 dynamic; 2 extended)

Peak translations: 2, occurred 00:31:43 ago

Dynamic mappings:

-- Inside Source

[Id: 3] access-list 1 pool NAT-POOL2 refcount 2