LINUX NETWORKING MODULE 6 ASSESSMENT SOLUTION

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4. You are given three IP addresses: 192.168.10.5, 172.20.15.1, and 8.8.8.8. Identify the class of each IP address. Determine if it is private or public. Explain how NAT would handle a private IP when accessing the internet.

1. 192.168.10.5

- Class: Class C (Range: 192.0.0.0 – 223.255.255.255)
- Private/Public: Private (192.168.0.0 – 192.168.255.255 is reserved for private use)

2. 172.20.15.1

- Class: Class B (Range: 128.0.0.0 – 191.255.255.255)
- Private/Public: Private (172.16.0.0 – 172.31.255.255 is reserved for private use)

3. 8.8.8.8

- Class: Class A (Range: 1.0.0.0 – 126.255.255.255)
- Private/Public: Public (Google's public DNS server)

Network Address Translation (NAT) Handling for Private IPs

When a device with a private IP (e.g., 192.168.10.5 or 172.20.15.1) wants to access the internet, it cannot do so directly because private IP addresses are not routable on the public internet. NAT (Network Address Translation) is used to facilitate communication.

How NAT Works:

- The device with a private IP sends a request to access the internet (e.g., browsing a website).
- A router or firewall with NAT enabled replaces the private IP address with a public IP address assigned by the ISP.
- The request is sent to the destination (e.g., a web server).
- The web server responds to the public IP.
- The NAT device maps the response back to the original private IP and forwards it to the requesting device.

Types of NAT:

- Static NAT: One-to-one mapping of private to public IP.
- Dynamic NAT: A pool of public IPs is used to assign a temporary public IP.
- PAT (Port Address Translation): Multiple devices share a single public IP using different port numbers.