



# Christ (Deemed to be University) Kengeri Campus

## Assignment 7:

Explain Core Network Terms

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## Problem Statement

### 1. What to Do:

Create a simple guide explaining **5 important networking concepts** with pictures.

### 2. Scenario:

You're teaching someone the basics of how networks work — like explaining how mail gets delivered.

### 3. How:

Research and create simple explanations with diagrams for: - NAT

- ARP
- MAC
- IPv4
- IPv6

### 4. Why:

Understanding these terms is fundamental to cybersecurity — you can't protect what you don't understand.

## Methodology

To complete this assignment:

1. I identified the **5 core networking concepts**.
2. I conducted research using **trusted technical sources** like TechTarget and Wikipedia.
3. For each term, I:
  - Wrote a **simplified explanation** in my own words.
  - Created a **real-world analogy** to make it relatable.
  - Added **placeholder diagrams** to visually represent each concept.
4. Compiled all information into a **one-page Markdown guide**, following a structured format.

# Report:

## 1. NAT (Network Address Translation)

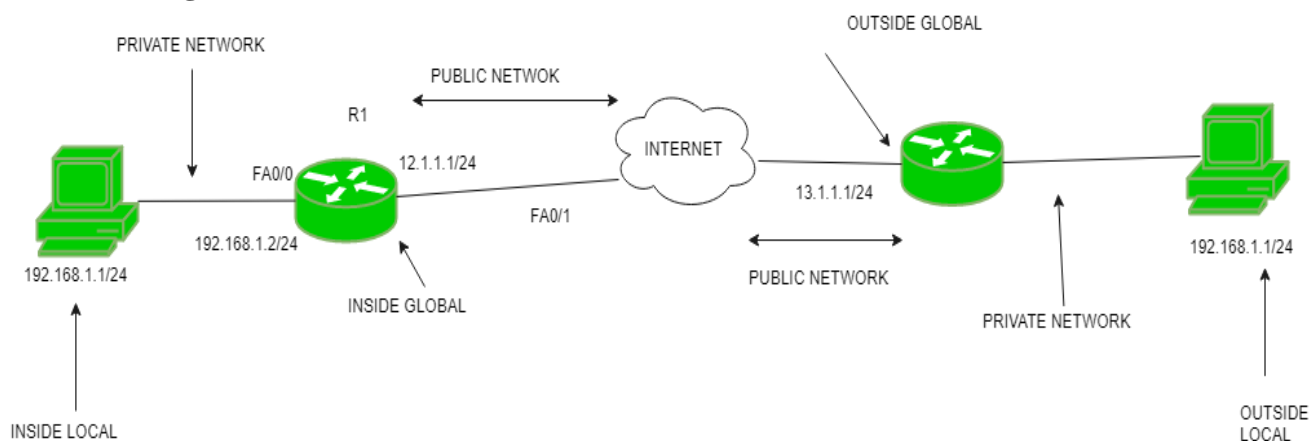
- **Definition:**

NAT allows multiple devices on a private network to share a single public IP address by translating local addresses into one external address.

- **Analogy:**

Like a neighborhood post office using one official address for all houses. Outgoing mail is stamped with the post office's address (the router), and the post office sorts incoming mail back to each home.

- **Diagram:**



## 2. ARP (Address Resolution Protocol)

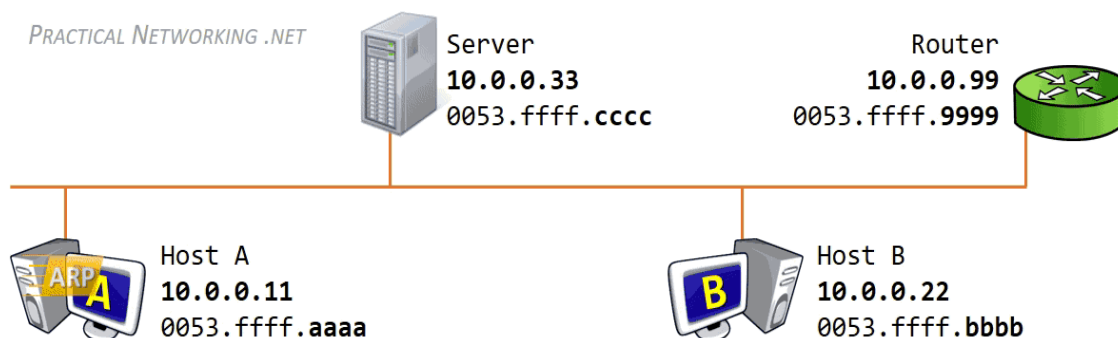
- **Definition:**

ARP finds a device's physical (MAC) address given its IP address by broadcasting a request on the local network.

- **Analogy:**

Like posting a note asking, "Who lives at House #A?" and only the correct resident replies with their apartment number (MAC address).

- **Diagram**



- **Definition:**

- **Analogy:**

- **Diagram**



IPv4 uses 32-bit addresses written in four decimal numbers (e.g., 192.168.0.1).

Like old postal ZIP codes — there were only so many 4-digit codes, and we're running out of them.

## IPv4 address in dotted-decimal notation



## 5. IPv6 (Internet Protocol Version

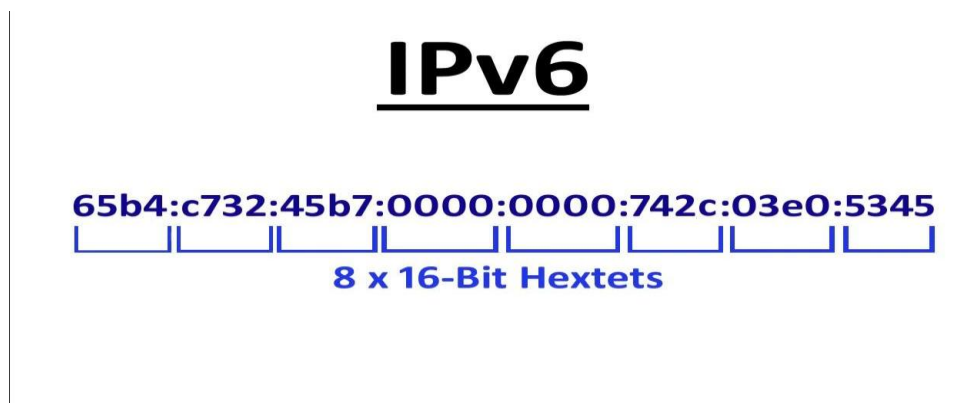
- **Definition:**

IPv6 uses 128-bit addresses written in eight hexadecimal groups.

- **Analogy:**

Like upgrading to really long ZIP codes with trillions of combinations — we won't run out of addresses anymore.

- **Diagram**



## Key Takeaways

- The **importance of IP addressing** in managing modern networks.
- How **NAT** helps preserve public IPs by translating private addresses.
- The role of **ARP** in connecting IP-level communication with hardware-level MAC addresses.
- Why **MAC addresses** are critical for device identification in local networks.
- The **limitations of IPv4** and the **advantages of IPv6** in supporting the growing number of internet-connected devices.
- That using **real-world analogies** makes technical topics easier to understand and remember.

## Conclusion

Networking works because of many small but essential mechanisms that handle addressing, translation, and communication. NAT enables multiple devices to share one public identity, ARP links logical IPs with physical MAC addresses, and MAC addresses ensure data reaches the right device. IPv4 introduced a structured system of numerical addresses, but its limitations pushed the world toward IPv6, which provides practically unlimited possibilities. Together, these concepts form the backbone of the internet and private networks, making seamless digital communication possible.

## Sources

- [techtarget.com](https://www.techtarget.com) - NAT
- [Wikipedia](#) - ARP
- [Wikipedia](#) - MAC Address
- [Wikipedia](#) - IPv4
- [Wikipedia](#) - IPv6