The Network Layer

*Aayush Tyagi*

* On a local area network or LAN, nodes can communicate with each other through their physical MAC addresses. But MAC addressing isn't a scheme that scales well, every single network interface on the planet has a unique MAC address and they aren't ordered in any systematic way.
* **IP addresses** are a 32 bit long numbers made up of four octets, and each octet is normally described in decimal numbers. 8 bits of data or a single octet can represent all decimal numbers from 0 to 255.
* 12.30.56.78 is a valid IP address, but 123.456.789.100 would not be because it has numbers larger than could be represented by 8 bits. This format is known as **dotted decimal notation**.
* **IP addresses** are distributed in large sections to various organizations and companies instead of being determined by hardware vendors. This means that IP addresses are more hierarchical and easier to store data about than physical addresses are.
* IP addresses belong to networks, not to the devices attached to those networks. Many modern networks you can connect a new device and an IP address will be assigned to it automatically through a technology known as **dynamic host configuration protocol**. An IP address assigned this way is known as a **dynamic IP address**.
* Mostly, static IP addresses are reserved for servers and network devices, while dynamic IP addresses are reserved for clients. But there are certainly situations where this might not be true.