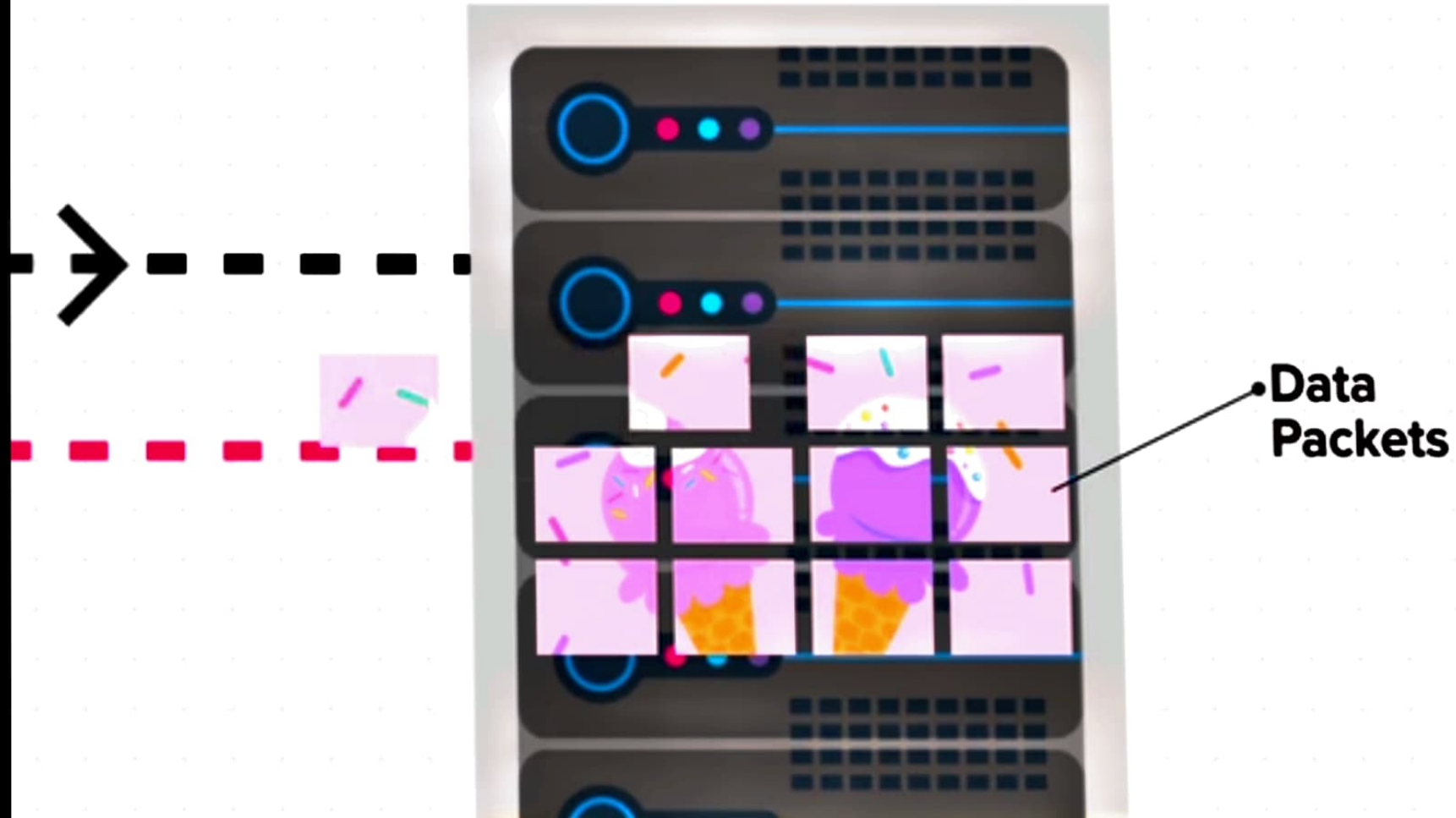
Client Server Model

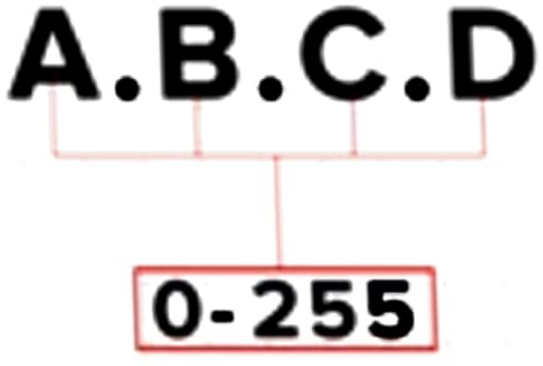

Data
Packets

Observations

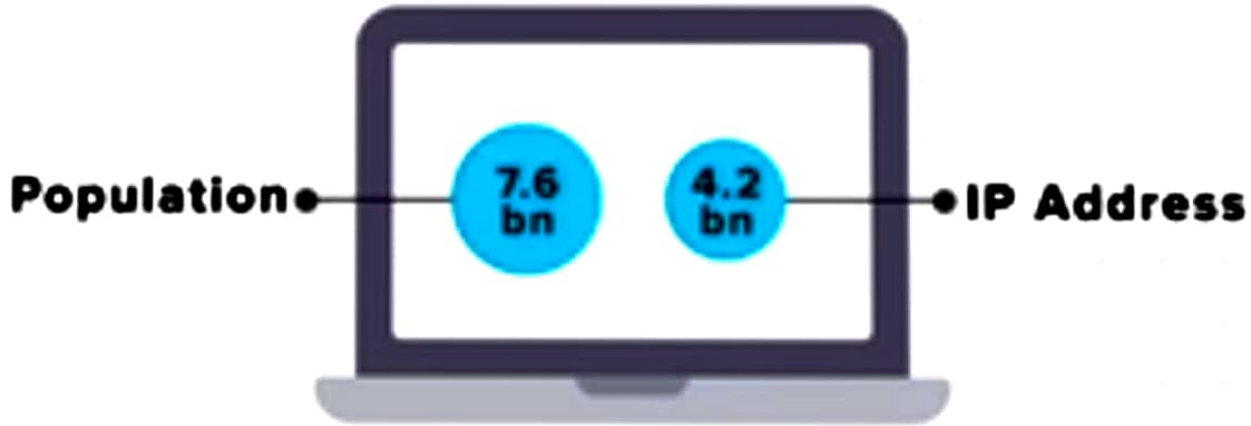
- Your friend needs to have a phone number.
- You need to have a phone number.
- All of the phone numbers must be unique.

198.162.1.1

IPV4- IP VERSION 4



IPV4- IP VERSION 4


Population
7.6 bn
4.2 bn
IP Address

A:B:C:D:E:F:G:H

0-9

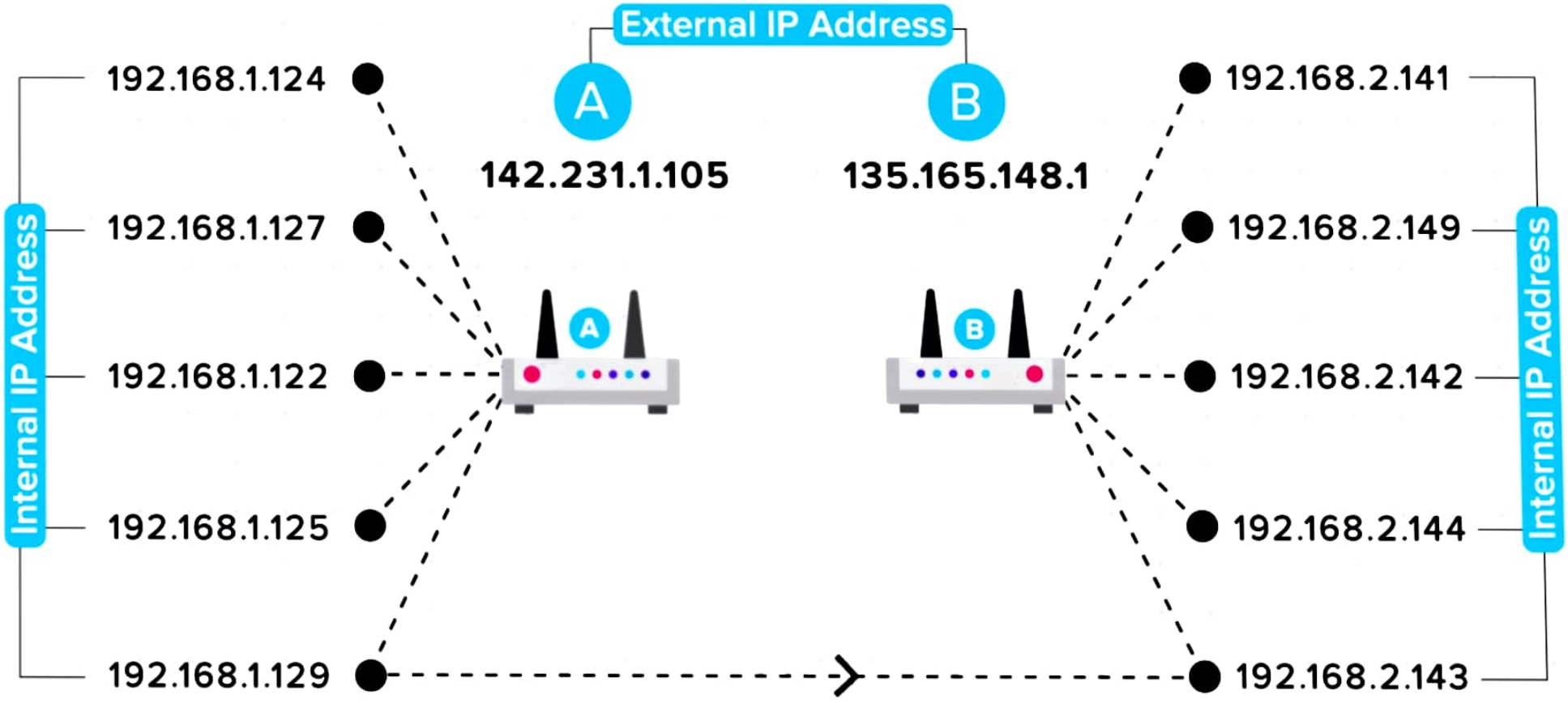
a- f

A- F

IP VERSION 6


Solution 1:
IPv6 Addresses
Problem:
Limited IPv4
Addresses

Solution 2:
NAT or Network Address Translation


External IP Address
A
B
142.231.1.105
135.165.148.1
Internal IP Address
192.168.1.124
192.168.1.127
192.168.1.122
192.168.1.125
192.168.1.129
A
B
192.168.2.141
192.168.2.149
192.168.2.142
192.168.2.144
192.168.2.143
Internal IP Address

What is NAT?

The process of transferring and translating data between internal and external networks is called NAT or Network Address Translation.

Now that we know about IP address, we must know that some IP address ranges are reserved for special usages. Here is a list:

For small internal networks (Like your home or small office): 192.168.0.0 to 192.168.255.255

For large internal networks (Like large MNCs, colleges, schools): 172.16.0.0 to 172.31.255.255

For massive internal networks (Like telecom networks, satellites): 10.0.0.0 to 10.255.255.255

127.0.0.1 : This is called the LoopBack address and is used as the address of your own machine. (We will look at its uses later)

1. Check for your internal and external IP addresses using the steps given below.

For Windows Users:
1. Click on the start menu and type cmd to open the command prompt.
2. Type ipconfig and press enter.
3. Your will see your Internal IP Address.

For Linux/Mac Os users:
1. Open your "Terminal" (Ctrl/Cmd + Alt + T).
2. Type ifconfig and press enter.
3. Your will see your Internal IP Address.

To find the external IP address, just search for ip address on google and to use these free websites to check your external IP address.
whatsmyip.com
ipchicken.com
ipcow.com

2. Find the internal and external IP addresses of 2 devices connected to the same WiFi network and check the following:
a. Are the Internal Addresses same?
b. Are the External Addresses same?
c. Does the Internal Address change after restarting the WiFi router?
d. Does the External Address change after Restarting the WiFi router?

Q1/4

Which of these IP addresses is incorrect?

A 1.0.0.4

B 127.0.2.255

C aab4:ab76:f3d3:d980:f2l3:a9ee

Well done. Correct Answer.

Explanation:
The 5th chunk in the address is f2l3 which is invalid as it can only be between 0-9 and a-f. "l" is invalid.

D e004:1234:5678:9810:afff:c3d4

Q2/4

Rohit has the IP address of a girl he likes. Can he get her exact house address using this?

A Yes

B No

Well done. Correct Answer.

Explanation:
The IP address can be used to find a logical path to your laptop but not to find the exact physical location of it.

Q3/4

Airbnb wants to setup an Internal Network consisting of 600 devices. Which of these reserved ranges will be best for their office?

A 192.168.0.0 - 192.168.255.255

Well done. Correct Answer.

Explanation:
In the first series the total number of combinations will be 0.0 - 255.255 = 256*256 = 65536
In the second series the total number of combinations will be 16.0.0 - 31.255.255 = 16*256*256= 1048576
In the third series the total number of combinations will be 0.0.0 - 255.255.255 = 256*256*256= 16777216
So, the first range satisfies the maximum IP addresses we need for 600 devices and to avoid wastage, we avoid using the bigger series as we will never need the rest of the addresses.

B 172.16.0.0 - 172.31.255.255

C 10.0.0.0 - 10.255.255.255

D Any of the above

Q4/4

If you try to reach 127.0.0.1 without being connected to any wireless/wired network, will you be able to reach it?

A Yes

Well done. Correct Answer.

Explanation:
As 127.0.0.1 is also known as the localhost/loopback address, it is the address of your own device (i.e the device which is trying to reach it), hence, it doesn't need to be connected to any wireless/wired network since the device is always connected to itself.

B No

Now that we have come to the end of this topic, you should be able to:

1. Explain the core concepts of IP addressing
2. Understand how your household network and the internet works
3. Extract the various IP addresses of your own devices
4. Classify IP addresses based on version, network infrastructure, and availability
5. Explain the concept of NAT

If you have doubts regarding any of the above mentioned points, please go through the relevant videos and text chapters again.