



Lab Lesson-1

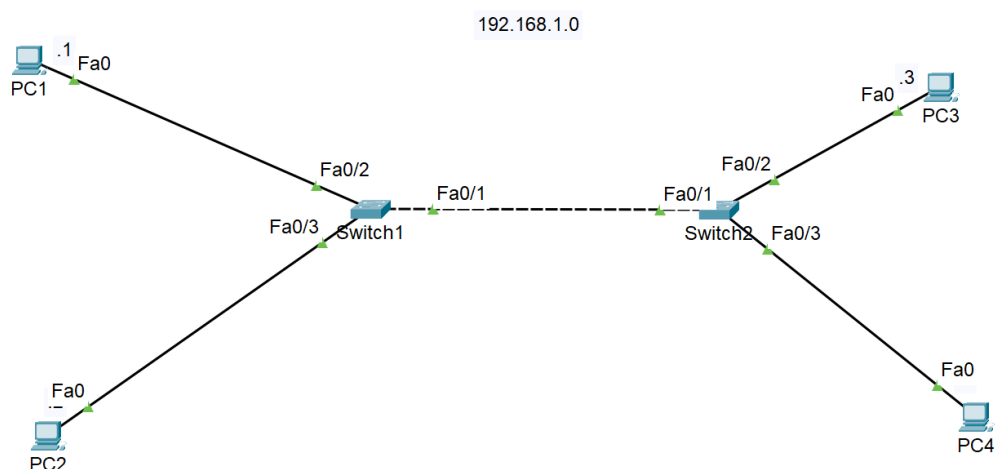
Hello Everyone. Lets learn by our mistakes.

How PCs chit chat in a LAN 🗨️

Core Concepts:

ICMP, ARP

Today we will be playing with PCs and switches. Lets start this game



Configure ip address

First configure ip address of each PCs. This can be done by clicking PC1→Config→FastEthernet0(or any other interface you connected to)→IPv4 Address

PC1: 192.168.1.1

PC2: 192.168.1.2

PC3: 192.168.1.3

PC4: 192.168.1.4

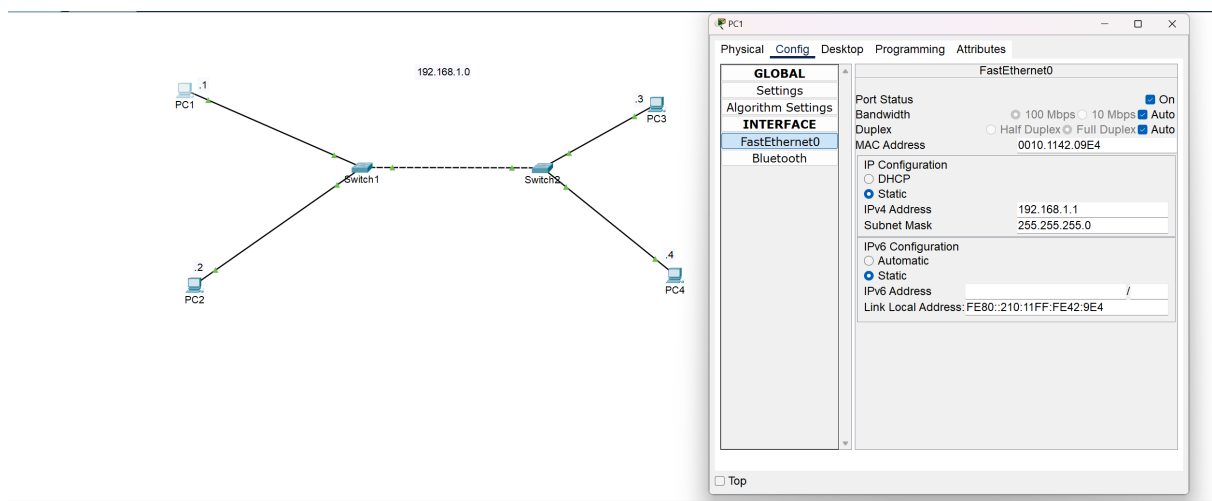


Fig-2

Mac address Table

Now go to switch 1→CLI

Enter Commands

enable→configure terminal→do show mac address-table

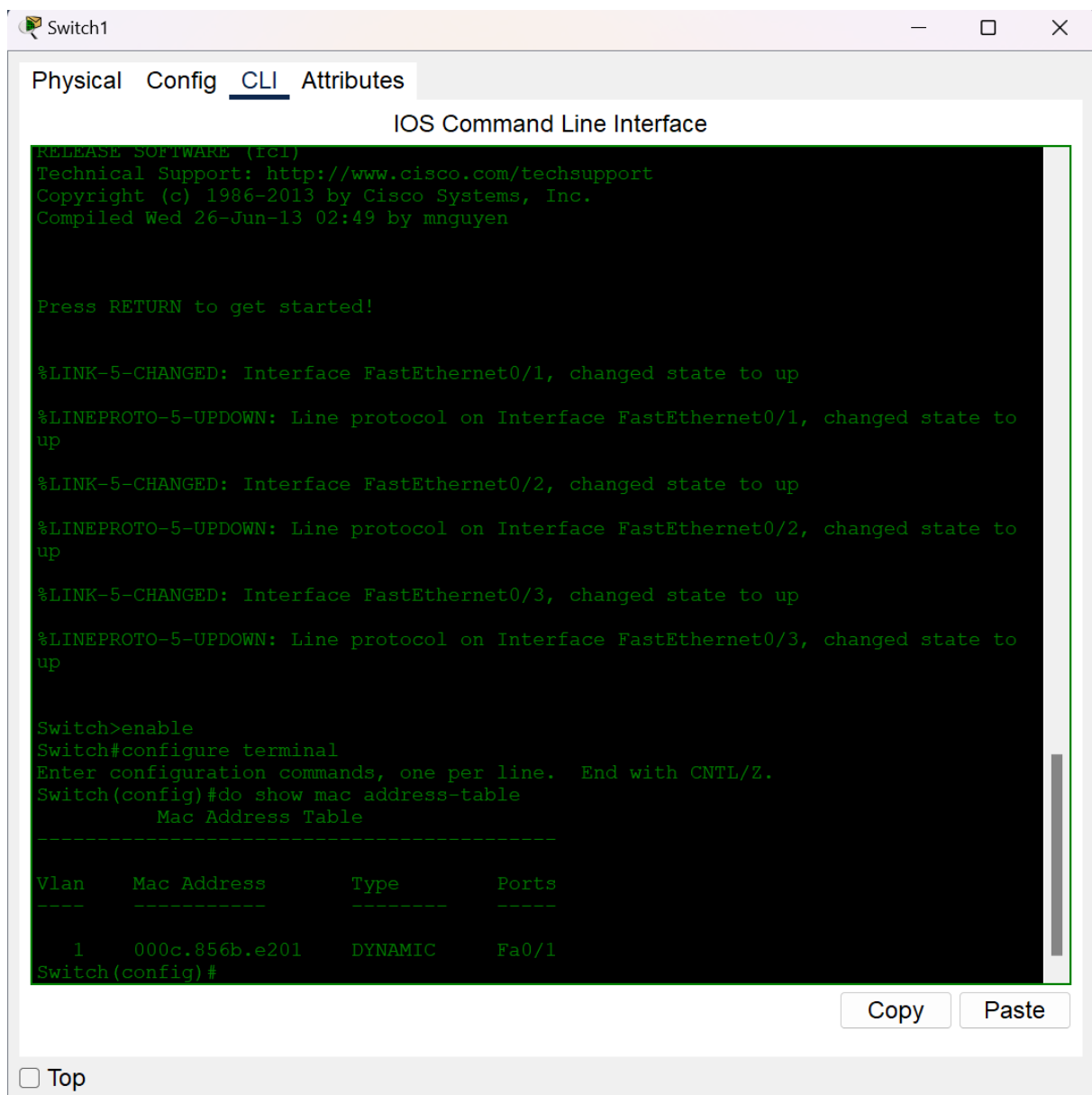


Fig 3

The above shows the mac address of switch 2 and i know you must be thinking hi Anas **how do you know that its mac address of switch 2....it can be any other mac address..**

Well to that i say that there are 2 reason

- 1)Its on the same interface of switch 1 in which switch 2 is connected i.e. Fa0/1
- 2)second look below pic

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Switch#show interface
FastEthernet0/1 is up, line protocol is up (connected)
  Hardware is Lance, address is 000c.856b.e201 (bia 000c.856b.e201)
  BW 100000 Kbit, DLY 1000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Full-duplex, 100Mb/s
  input flow-control is off, output flow-control is off
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:08, output 00:00:05, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue :0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
    956 packets input, 193351 bytes, 0 no buffer
    Received 956 broadcasts, 0 runts, 0 giants, 0 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
    0 watchdog, 0 multicast, 0 pause input
    0 input packets with dribble condition detected
  2357 packets output, 263570 bytes, 0 underruns
    0 output errors, 0 collisions, 10 interface resets

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Paste

Fig 4

We'll focus on 3rd line where it states the mac address of this switch port interface which is 000c.856b.e201

Now other question is **how does SW1 know the mac address of SW2 by default and vice versa** well to that there is only one answer STP(Spanning Tree Protocol) its really beautiful Protocol.in short it makes the communication between switches as soon as they get connected to each other

Lets PING

Now lets ping from PC2 to PC4 and see the changes in mac address

click PC2→Desktop→Command Prompt→

enter "ping 192.168.1.4"

Well now lets see the results in the mac address table in SW1 and SW2

General info

Mac address of

PC2: 0000.0C61.4D1D

SW1: 0030:F219:3401

PC4: 0004.9A66.9721

SW2: 000C:856B:E201

Before Pinging

SW1(config)#do show mac address-table				SW2(config)#do show mac address-table			
Mac Address Table				Mac Address Table			
Vlan	Mac Address	Type	Ports	Vlan	Mac Address	Type	Ports
1	000c.856b.e201	DYNAMIC	Fa0/1	1	0030.f219.3401	DYNAMIC	Fa0/1

Fig 5

After Pinging

SW1#show mac add				SW2#show mac add			
Mac Address Table				Mac Address Table			
Vlan	Mac Address	Type	Ports	Vlan	Mac Address	Type	Ports
1	0000.0c61.4d1d	DYNAMIC	Fa0/3	1	0000.0c61.4d1d	DYNAMIC	Fa0/1
1	0004.9a66.9721	DYNAMIC	Fa0/1	1	0004.9a66.9721	DYNAMIC	Fa0/3
1	000c.856b.e201	DYNAMIC	Fa0/1	1	0030.f219.3401	DYNAMIC	Fa0/1

Fig 6

well this happened due to ARP...explanation given below.

Below we can see different protocol in action like ARP and ICMP

<https://prod-files-secure.s3.us-west-2.amazonaws.com/37f68683-ddb1-4f61-84cb-0ac61321d8d3/2a849a71-ec3a-4b37-a934-f1cd0110c78a/Untitled.mp4>

vid-1

Explanation:

PC2 first send ARP Request which is and broadcast frame then the PC4 receives the ARP request by recognizing the same ip address then in return PC4 will ARP reply to PC2 which is a known unicast frame due to this process SW1 and SW2 learns about the mac address of PC2 and PC4 which they save in mac address table in return. Also PC2 and PC4 learns each other mac address which can be seen in arp table

After that SW1 knows the mac address of PC2 and PC4 its easy peasy now to send ICMP message, both will be unicast

Question answered by GPT

wallaa...Congrats now our PCs can communicate with each other and the best thing is we know HOW