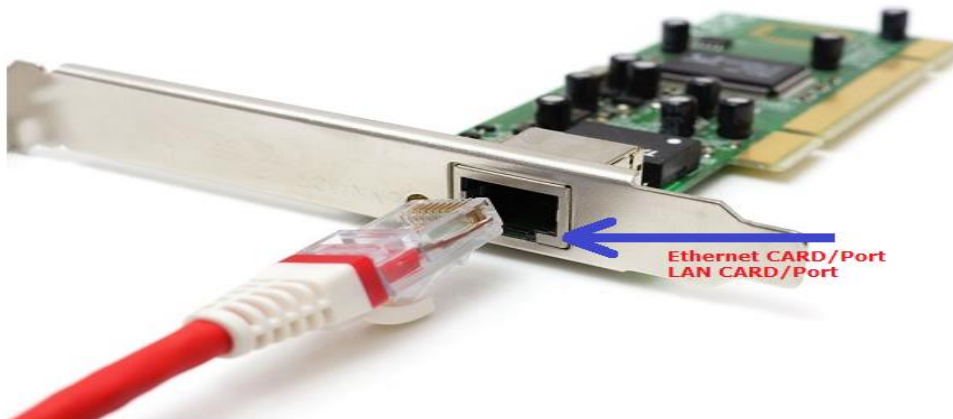


How packet flow works with ARP protocol and ICMP Message between two PC

In a local area to make a communication that technology are used, called LAN technology.

There are many technologies for LAN technology like – Ethernet technology, FDDI, Token ring, token bus

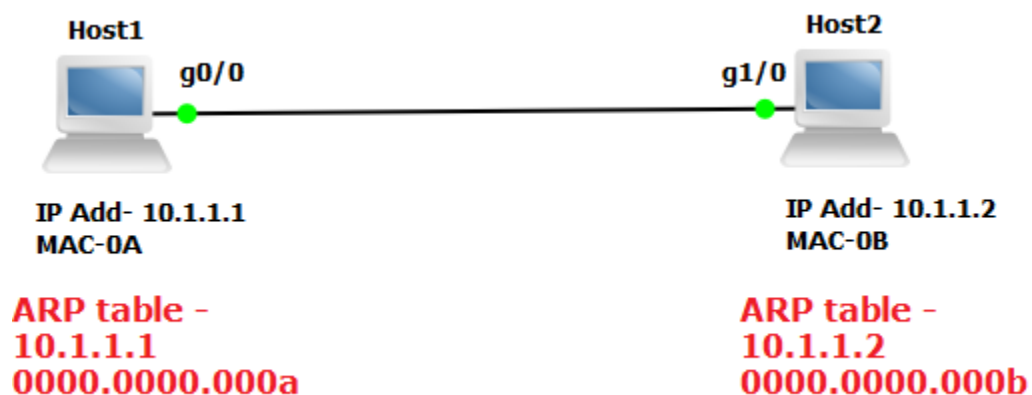
But now a days we are using Ethernet technology to make a communication in LAN .



Note- If any machine where Ethernet card/port are available there will be ARP table. In Windows OS self ip address and Mac's information does not available but if CISCO OS is available there will be ARP table. As demonstrated below –

```
Host1#show arp
Protocol Address      Age (min)  Hardware Addr  Type   Interface
Internet 10.1.1.1          -         0000.0000.000a  ARPA   GigabitEthernet0/0
Host1#
```

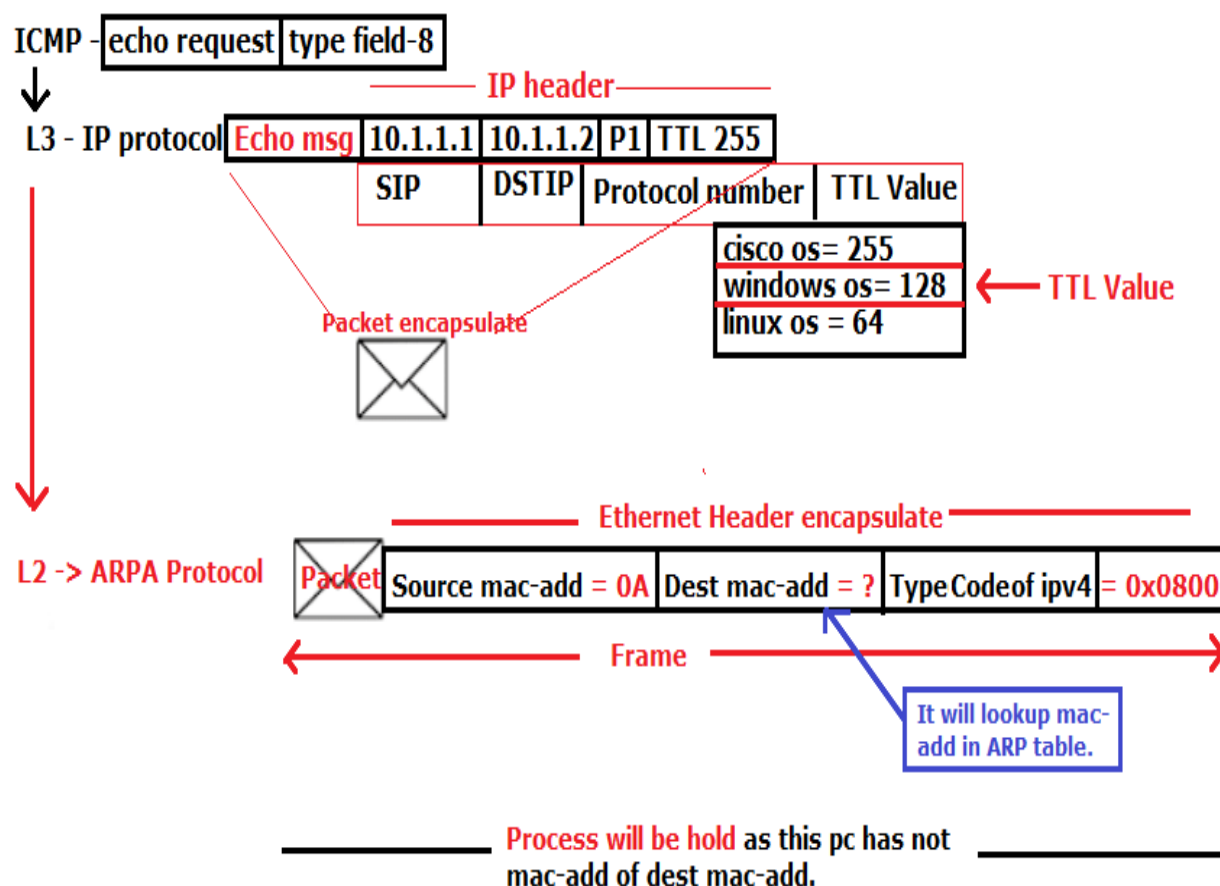
Let's see practical –



Go to the host 1 – type CMD

```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows [Version 10.0.19041.928]
(c) Microsoft Corporation. All rights reserved.
C:\Users\De11.DESKTOP-G5EF6DM> ping 10.1.1.2
```

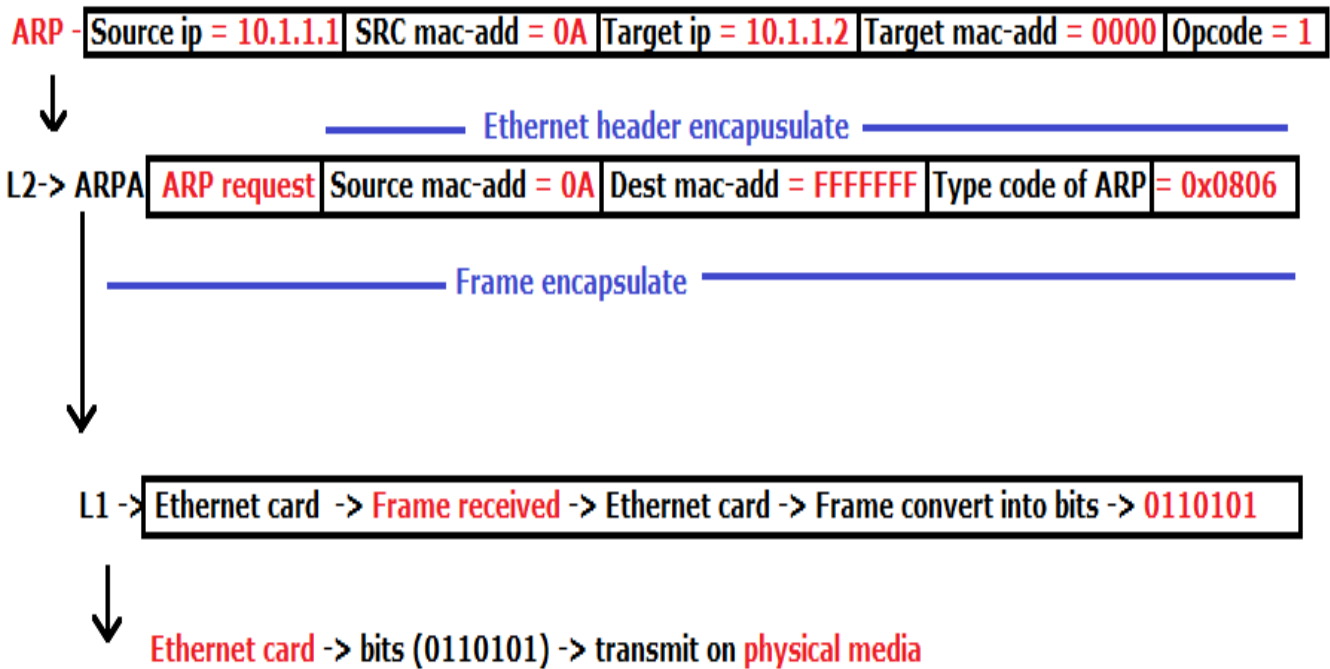
C:\> ping 10.1.1.2



Then ARPA will give responsibility to ARP protocol to resolve the mac -add of the destination device.

ARP process –

It is used to resolve the Mac-add of the destination machine on the basis of ip address.

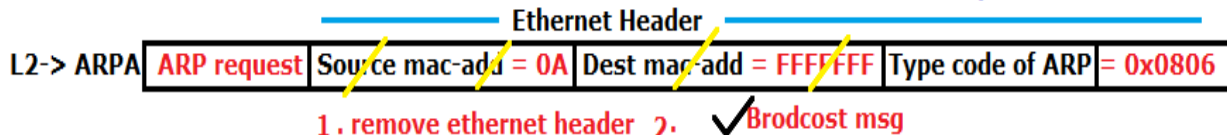


At receiving:-

L1 -> Ethernet card -> bits receive -> Ethernet card -> bits convert -> Frame

L2 -> ARPA -> Frame receive

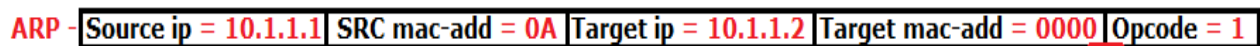
Then ARPA Protocol will check destination mac-add. -> FFFFFFFF then it will accept.



remaining payload - it will check by type code -> 0x0806



ARP Protocol ->



It will identify by type opcode that which msg
that means ARP request msg is.

Then it will update own ARP table.

As shown updated ARP table -

```
Host2#show arp
Protocol Address      Age (min)  Hardware Addr  Type   Interface
Internet 10.1.1.1      87        0000.0000.000a ARPA    GigabitEthernet1/0
Internet 10.1.1.2      -         0000.0000.000b ARPA    GigabitEthernet1/0
Host2#
```

Now ARP will give reply/ response message - to host1

ARP ->

Source ip = 10.1.1.2	Source mac-add = 0B	target ip = 10.1.1.1	target mac = 0A	Opcode = 2
----------------------	---------------------	----------------------	-----------------	------------

Reply msg

↓
L2-> ARPA

ARP reply	source mac-add = 0B	Dest mac-add = 0A	type code of ARP = 0X0806
-----------	---------------------	-------------------	---------------------------

Frame encapsulate

↓
L1 -> Ethernet card -> Frame received -> Ethernet card -> Frame convert into bits -> 0110101

↓
Ethernet card -> bits (0110101) -> transmit on physical media

L1 -> Ethernet card -> bits receive -> Ethernet card -> bits convert -> Frame

↓
L2-> ARPA

ARP reply	source mac-add = 0B	Dest mac-add = 0A	type code of ARP = 0X0806
-----------	---------------------	-------------------	---------------------------

Remove ethernet header

then it will check destination mac-add - 0A means self I'm

ARP ->

Source ip = 10.1.1.2	Source mac-add = 0B	target ip = 10.1.1.1	target mac = 0A	Opcode = 2
----------------------	---------------------	----------------------	-----------------	------------

Reply msg

ARP response msg ✓

ARP protocol will check destination ip address - 10.1.1.1 means self I'm

Now it will update own ARP table

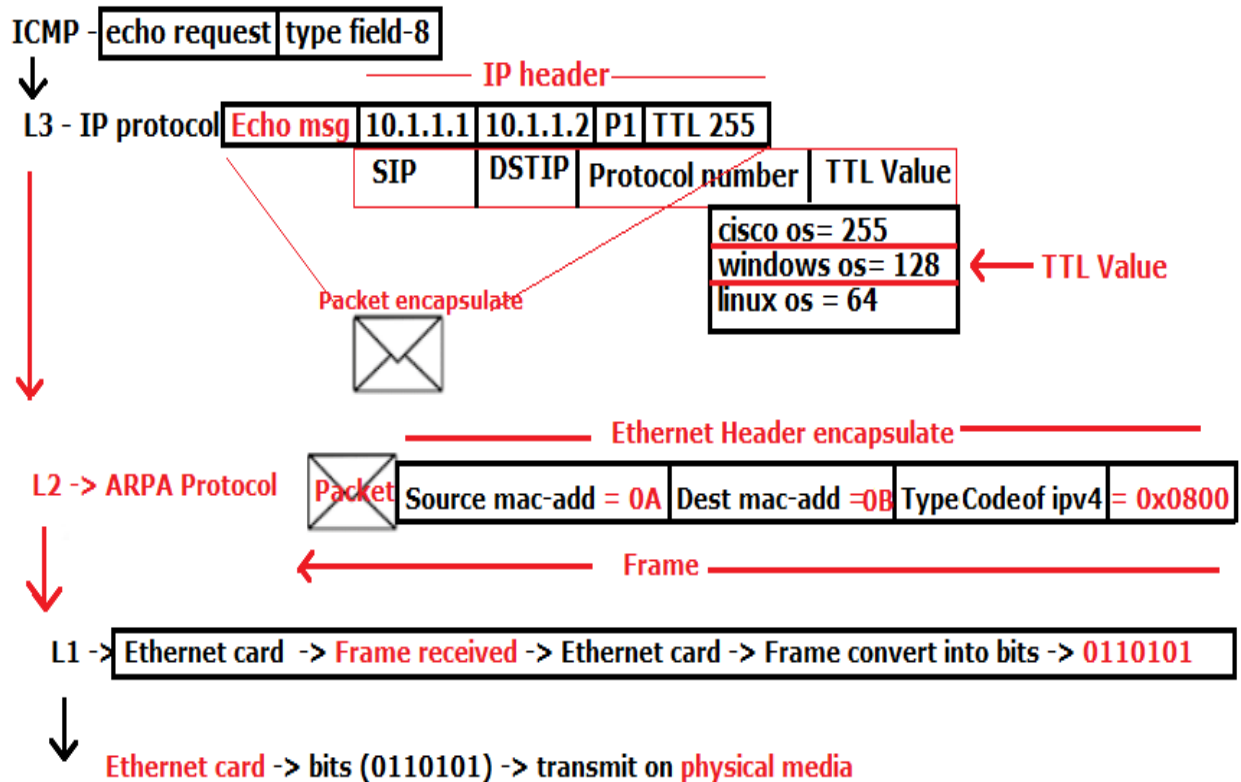
As shown updated ARP table –

```
Host1#show arp
Protocol Address      Age (min)  Hardware Addr  Type   Interface
Internet 10.1.1.1      -          0000.0000.000a ARPA    GigabitEthernet0/0
Internet 10.1.1.2      111        0000.0000.000b ARPA    GigabitEthernet0/0
Host1#
```

Now it will generate again **ICMP echo request message** to the requested host

2nd ICMP echo request message –

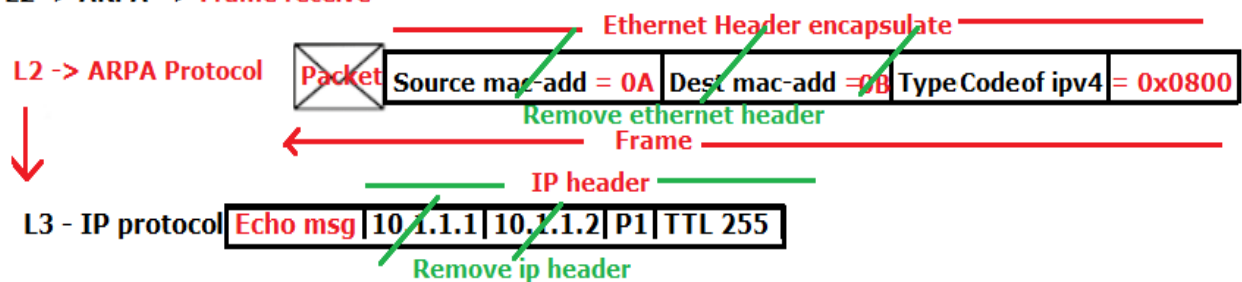
C:\> ping 10.1.1.2



Receiving end (Host2):-

L1 -> Ethernet card -> bits receive -> Ethernet card -> bits convert -> Frame

L2 -> ARPA -> Frame receive

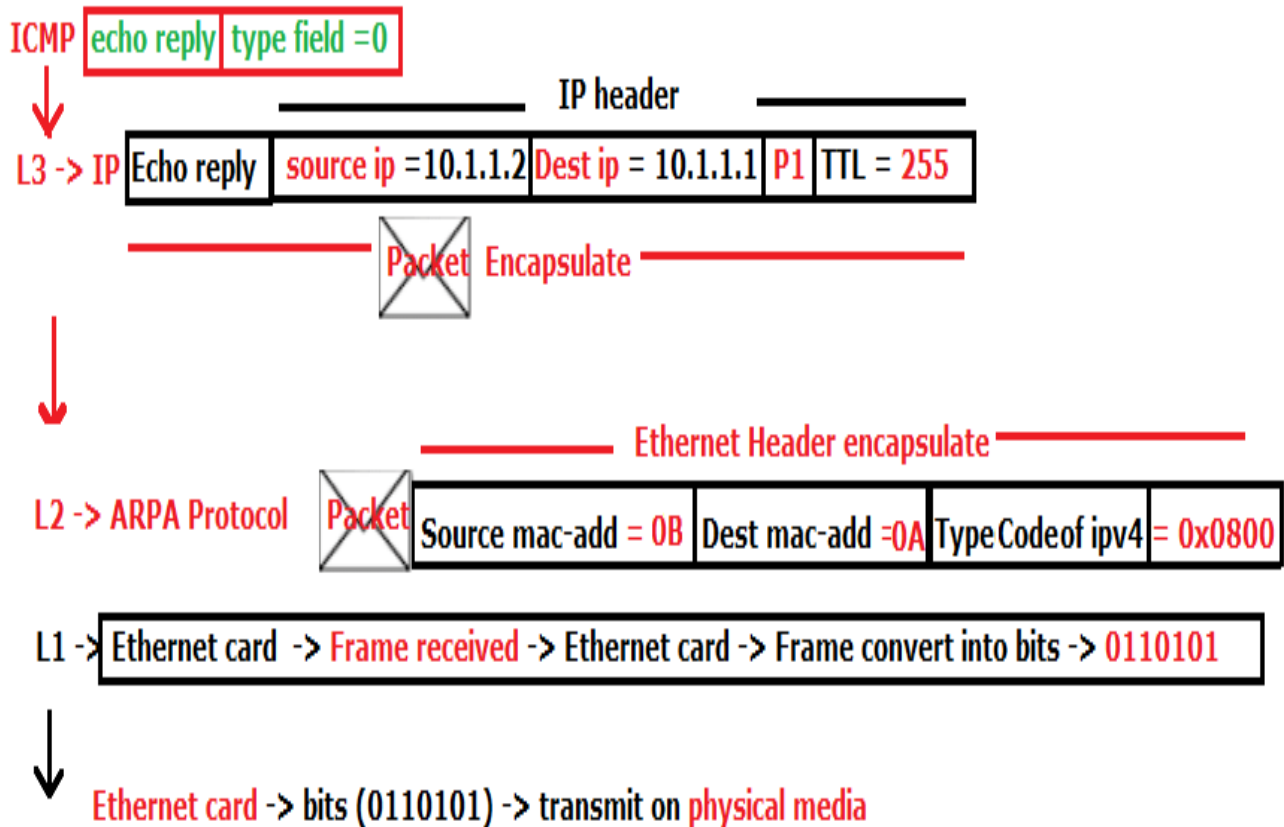


--> Remaining payload will handover to ICMP protocol. Identify will be protocol number.

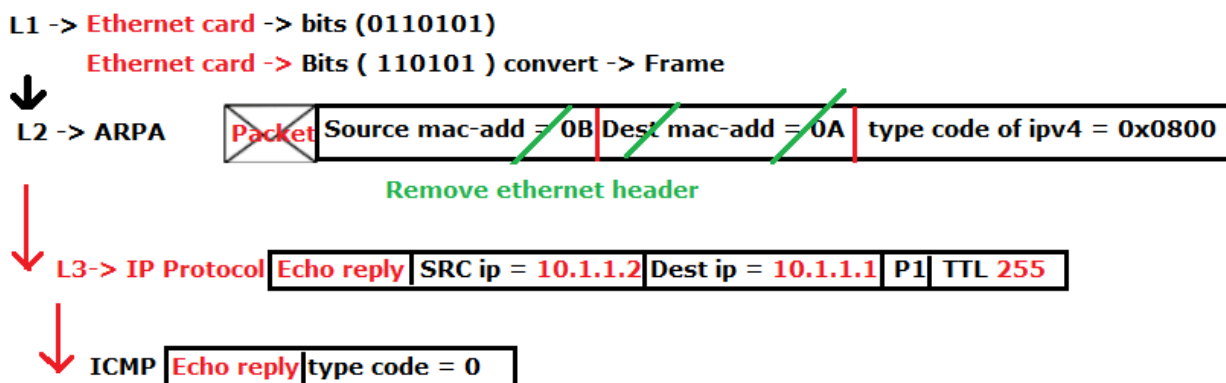
ICMP - echo request | type field-8 typed code = 8 means this msg is echo request.

then machine will give echo reply message

In echo reply message ICMP protocol will mention typed code = 0 (From HOST 2)



Receiving End – On Host1



Now you will get three reply messages from host – one packet will get dropped.
(Request time out).

Request time out.

- ✓ Reply from 10.1.1.2
- ✓ Reply from 10.1.1.2
- ✓ Reply from 10.1.1.2

Name – Umesh Prajapati

Designation - Network Eng.

Mail – umesh11238@gmail.com

From – AZAMGARH (U.P – INDIA)