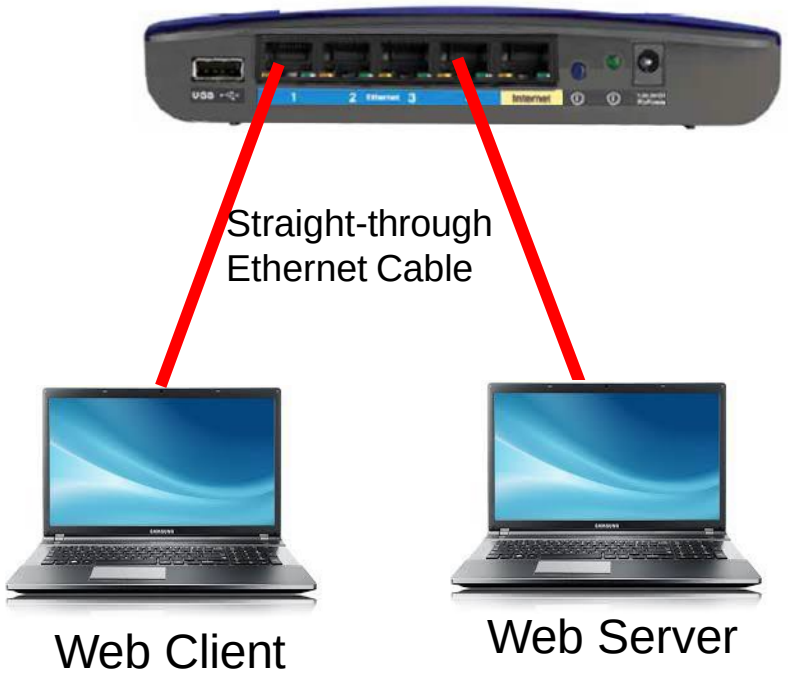
ALGONQUIN COLLEGE

CST8109: LAB 3: REVIEW

Learning Objectives

- Layers of Addressing
- MAC Address
- Determining your MAC address
- ARP Protocol
- Wireshark Packet Capture and Analysis

Physical Topology

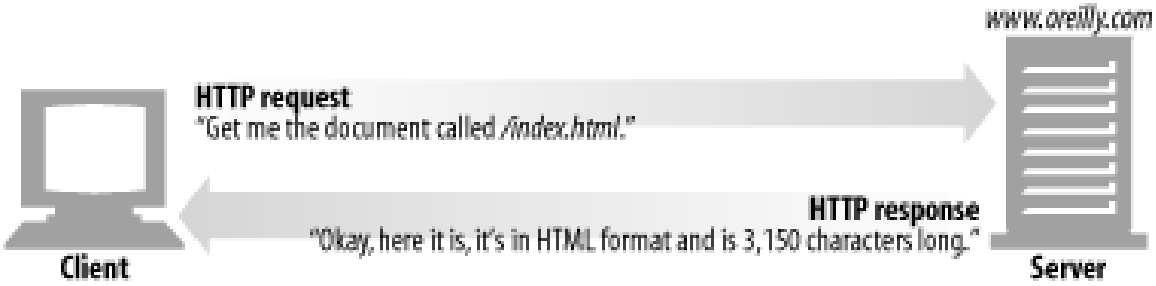


You need to work with a partner for Lab 3

E2500 Router Information

http://www.linksys.com/ca/support-article?articleNum=142360

Web Server and HTTP Protocol



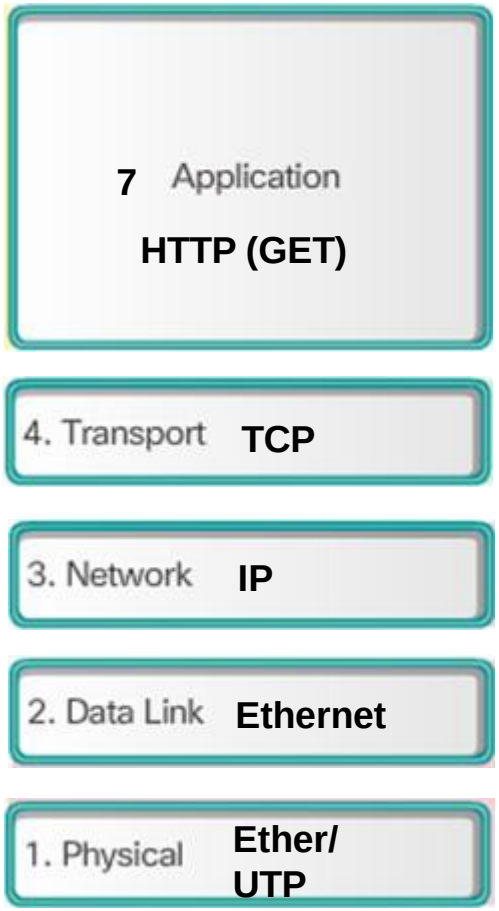
HTTP method	Description
GET	Send named resource from the server to the client.
PUT	Store data from client into a named server resource.
DELETE	Delete the named resource from a server.
POST	Send client data into a server gateway application.
HEAD	Send just the HTTP headers from the response for the named resource.

Filter: http Expression... Clear Apply Save

No.	Time	Source	Destination	Protocol	Length	Info
21	4.87392500	192.168.1.134	192.168.1.133	HTTP	400	GET / HTTP/1.1
23	4.88801900	192.168.1.133	192.168.1.134	HTTP	169	HTTP/1.1 200 OK (text/html)
30	5.11658800	192.168.1.134	192.168.1.133	HTTP	377	GET /favicon.ico HTTP/1.1
32	5.11833200	192.168.1.133	192.168.1.134	HTTP	215	HTTP/1.1 404 Not Found (text/html)
50	13.7240690	192.168.1.134	192.168.1.133	HTTP	426	GET / HTTP/1.1
52	13.7296610	192.168.1.133	192.168.1.134	HTTP	169	HTTP/1.1 200 OK (text/html)

Network Addresses

Network Addresses and Data Link Addresses

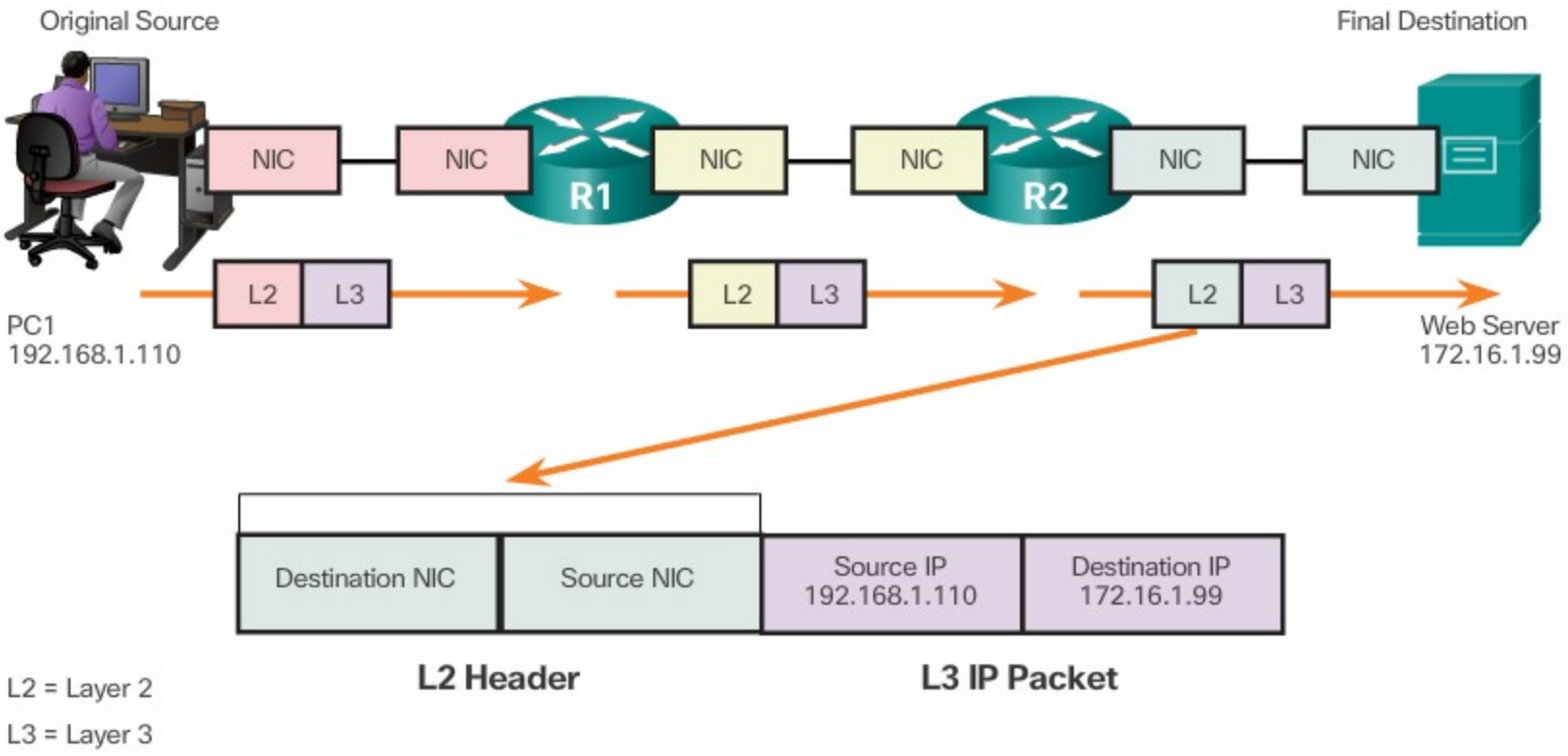


Network Layer Address (Globally Routed)
Eg. IP Address

Link Layer Address (Locally Switched)
Eg. Ethernet MAC Address

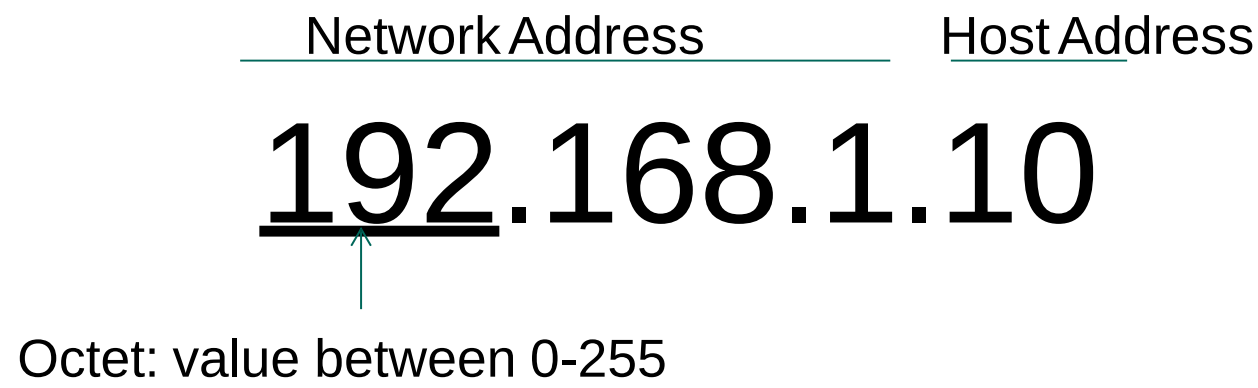
Data Link Address (cont.)

Layer 2 Address is Local Link Address
Layer 3 Address = Global Network Address



IP Address

IP Address Length: 32 Binary Digits (bits)
Dotted Decimal Notation



This is also called an IPv4 Address.
This is based on version 4 of the IP protocol.

Hexadecimal

- Also called Hex as a short form
- Base 16 Number System
- Hex uses 16 digits: 0-9 and a,b,c,d,e,f
- Compresses 4 Binary Digits into 1 Hex Digit

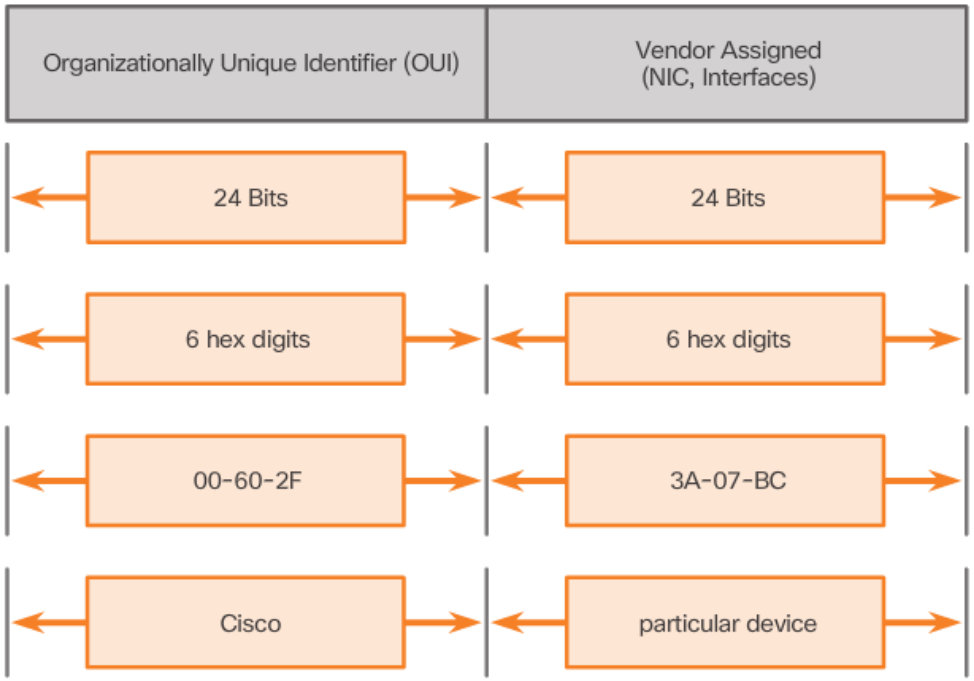
Hexadecimal Numbering

Decimal and Binary equivalents of 0 to F Hexadecimal

Decimal	Binary	Hexadecimal
0	0000	0
1	0001	1
2	0010	2
3	0011	3
4	0100	4
5	0101	5
6	0110	6
7	0111	7
8	1000	8
9	1001	9
10	1010	A
11	1011	B
12	1100	C
13	1101	D
14	1110	E
15	1111	F

Ethernet MAC Address

IP Address Length: 48 Binary Digits (bits)
Expressed in Hexadecimal Notation



MAC Address Format

00-26-6c-4a-2c-71

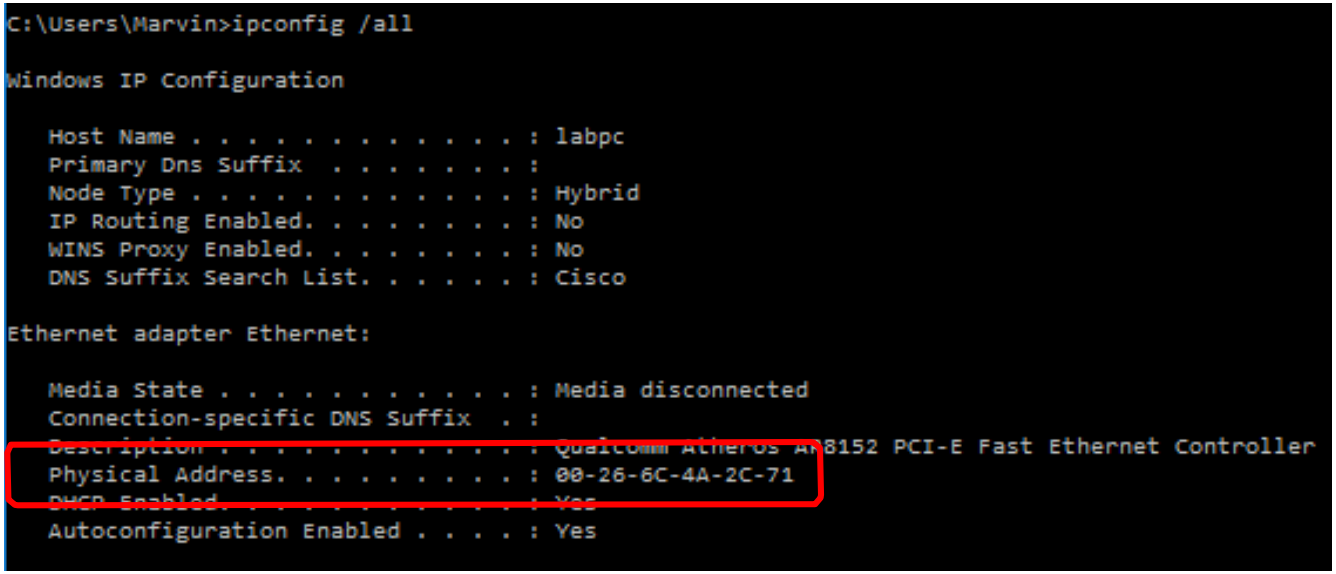
Inventec

My MAC Address

How to Discover your MAC Address

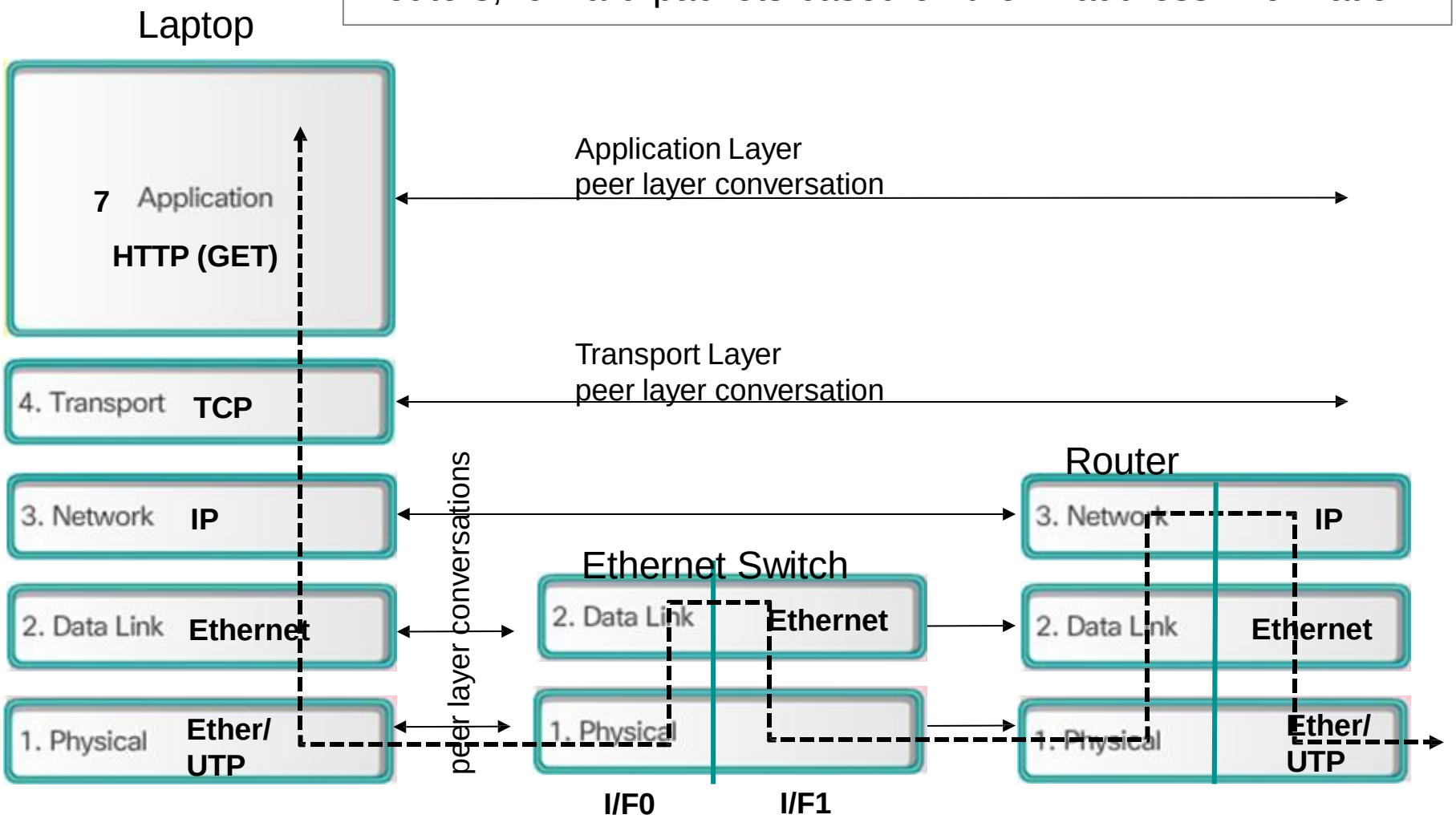
- Use Command: **ipconfig /all**

- The MAC Address is also called the physical address because it is part of the hardware interface adapter



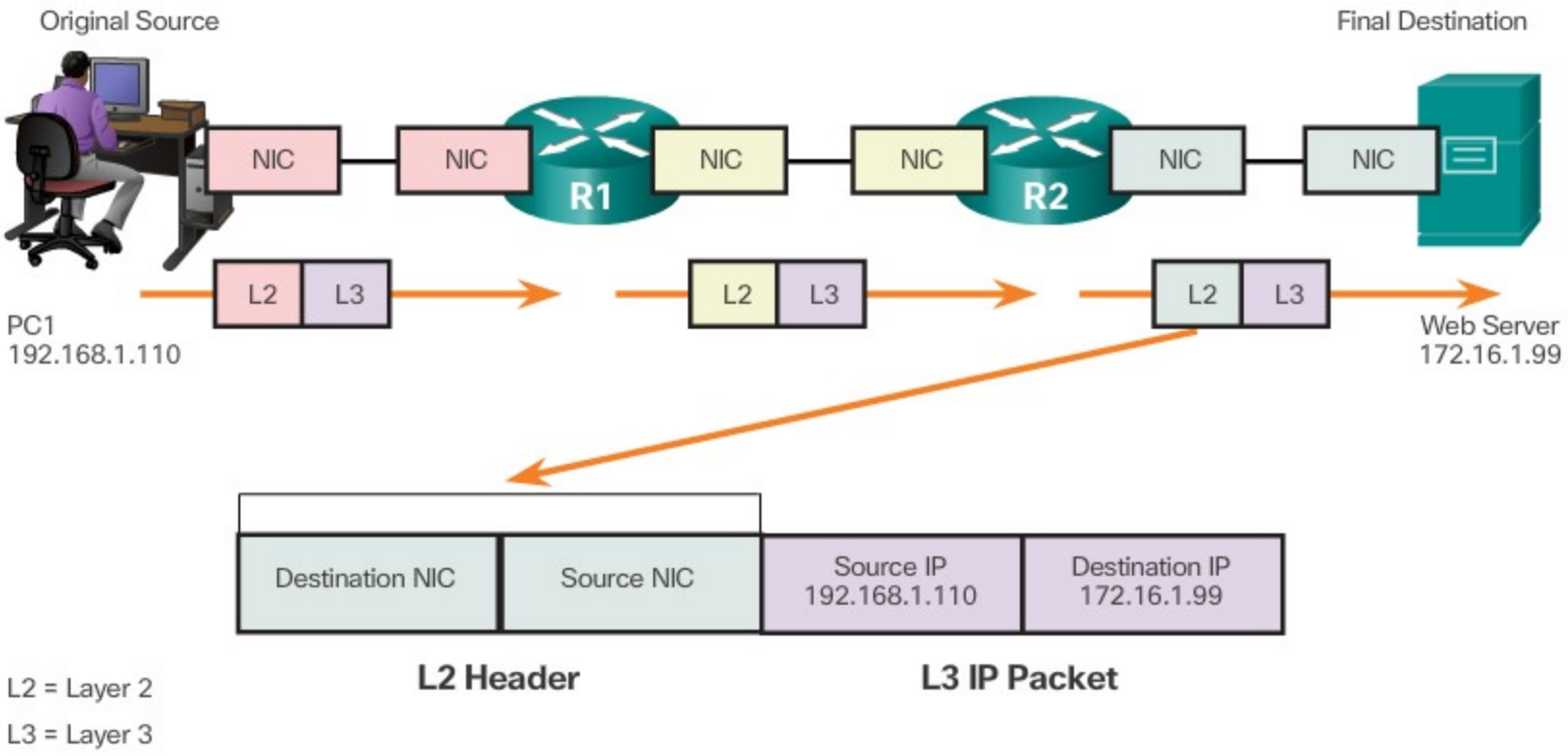
Ethernet Switch

Ethernet, switches frames based on MAC address information
Routers, forward packets based on the IP address information



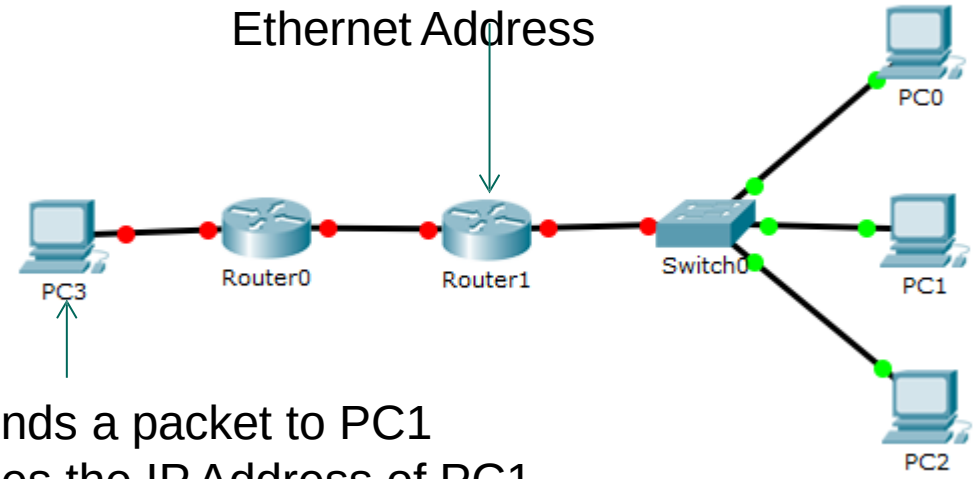
Data Link Address (cont.)

Layer 2 Address is Local Link Address
Layer 3 Address = Global Network Address



Address Resolution Protocol - ARP

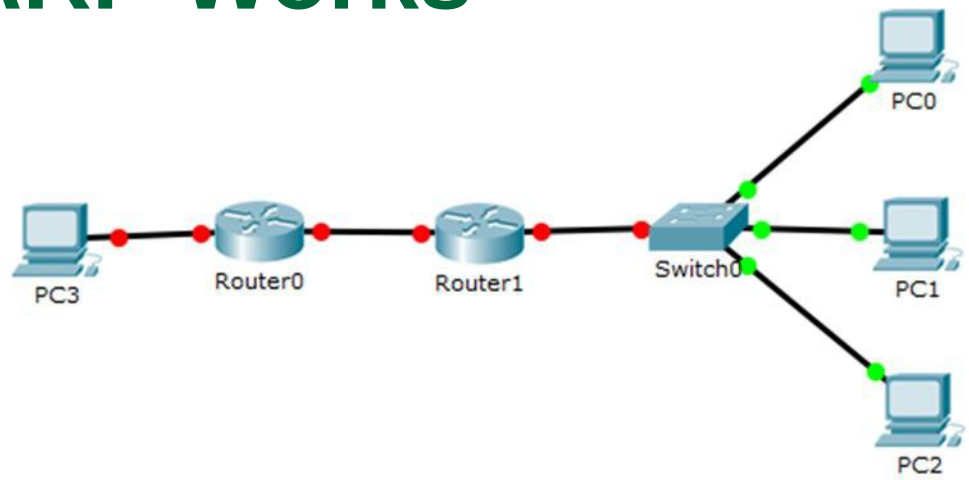
2 When a packet arrives at Router1
it uses Ethernet to send the packet to PC1
but Router1 has an IP Address but not an
Ethernet Address



1 PC3 sends a packet to PC1
PC3 uses the IP Address of PC1
and the Ethernet Address of Router0

Ref: ARP basics for the Cisco CCNA

How ARP Works



1. Router1 sends an Ethernet Broadcast message: Who Has IP Address
2. PC1 responds with its MAC address
3. Router1 sends the frame using Ethernet to PC1 using the MAC address learned in step 2

Filter: arp Expression... Clear Apply Save

No.	Time	Source	Destination	Protocol	Length	Info
13	4.86354100	WistronI_02:b1:8c	Broadcast	ARP	60	who has 192.168.1.133? Tell 192.168.1.134
14	4.86358800	CompalIn_a8:bb:cd	WistronI_02:b1:8c	ARP	42	192.168.1.133 is at b8:88:e3:a8:bb:cd
16	4.86417900	CompalIn_a8:bb:cd	Broadcast	ARP	42	who has 192.168.1.134? Tell 192.168.1.133
18	4.86457100	WistronI_02:b1:8c	CompalIn_a8:bb:cd	ARP	60	192.168.1.134 is at 20:6a:8a:02:b1:8c
63	16.0978680	CompalIn_a8:bb:cd	Cisco-Li_5a:19:d3	ARP	42	who has 192.168.1.1? Tell 192.168.1.133
64	16.0986110	Cisco-Li_5a:19:d3	CompalIn_a8:bb:cd	ARP	60	192.168.1.1 is at 48:f8:b3:5a:19:d3

Show the ARP Cache on your PC

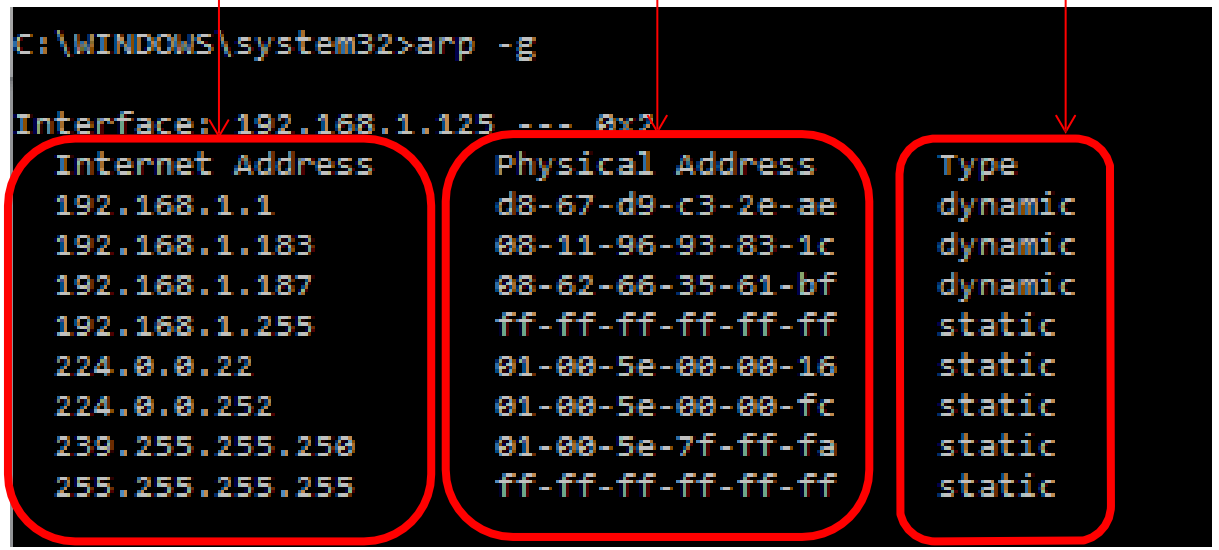
From your command prompt:
To view the ARP table enter:
arp -g

To delete the ARP table enter:
arp -d *

Devices connected to the same network segment.

Discovered MAC Address

MAC Address Assignment Type



END

ALGONQUIN
COLLEGE