|  |  |
| --- | --- |
| PROTOCOL | EXPLANTION |
| ARP Address  Resolution  Protocol | A Protocol for connecting a dynamic [IP address](https://whatis.techtarget.com/definition/IP-address-Internet-Protocol-Address) to a permanent physical machine address in a LAN . The physical machine address called “MAC”. |
| ICMP Internet  Control  Message  Protocol | A supporting protocol and is used by networks devices like routers for sending error messages and operational information indicating success or failure when communicating with another [IP address](https://en.wikipedia.org/wiki/IP_address" \o "IP address). |
| LLMNR Link Local  Multicast  Name  Resolution | An DNS based protocol that works only on Microsoft OS that translates domain names of close computer( on the same LAN) with out the need of DNS server. |
| SMB Server Message Block | A [communication protocol](https://en.wikipedia.org/wiki/Communication_protocol) for providing [shared access](https://en.wikipedia.org/wiki/Shared_access) to [files](https://en.wikipedia.org/wiki/Computer_file) and [printers](https://en.wikipedia.org/wiki/Print_server) between [nodes](https://en.wikipedia.org/wiki/Node_(networking)) on a network |
| TLS Transport Layer Security | A protocol to provide privacy and data between two or more communicating computer applications which encrypt the data transferred |

2)The RTT 8.808- 9.183=0.375sec

3) the DNS of the lab server is gaia.cs.umass.edu  
the DNS of our computer is { ip=192.168.1.10, port =62177 }.  
c) ?

(4)

No. Time Source Destination Protocol Length Info

85 18:12:08.808197 192.168.1.10 128.119.245.12 HTTP 353 GET /ethereal-labs/INTRO-ethereal-file1.html HTTP/1.1

Frame 85: 353 bytes on wire (2824 bits), 353 bytes captured (2824 bits) on interface \Device\NPF\_{26EC4540-1904-473B-8DA8-4B081DB4C0EF}, id 0

Ethernet II, Src: HewlettP\_1a:2a:d8 (00:24:81:1a:2a:d8), Dst: Cisco\_ed:72:3e (00:17:59:ed:72:3e)

Internet Protocol Version 4, Src: 192.168.1.10, Dst: 128.119.245.12

0100 .... = Version: 4

.... 0101 = Header Length: 20 bytes (5)

Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)

Total Length: 339

Identification: 0x0163 (355)

Flags: 0x40, Don't fragment

...0 0000 0000 0000 = Fragment Offset: 0

Time to Live: 128

Protocol: TCP (6)

Header Checksum: 0x0000 [validation disabled]

[Header checksum status: Unverified]

Source Address: 192.168.1.10

Destination Address: 128.119.245.12

Transmission Control Protocol, Src Port: 62177, Dst Port: 80, Seq: 1, Ack: 1, Len: 299

Source Port: 62177

Destination Port: 80

[Stream index: 3]

[Conversation completeness: Complete, WITH\_DATA (31)]

[TCP Segment Len: 299]

Sequence Number: 1 (relative sequence number)

Sequence Number (raw): 2679433946

[Next Sequence Number: 300 (relative sequence number)]

Acknowledgment Number: 1 (relative ack number)

Acknowledgment number (raw): 2594042444

0101 .... = Header Length: 20 bytes (5)

Flags: 0x018 (PSH, ACK)

Window: 256

[Calculated window size: 65536]

[Window size scaling factor: 256]

Checksum: 0x387c [unverified]

[Checksum Status: Unverified]

Urgent Pointer: 0

[Timestamps]

[SEQ/ACK analysis]

TCP payload (299 bytes)

Hypertext Transfer Protocol

GET /ethereal-labs/INTRO-ethereal-file1.html HTTP/1.1\r\n

Accept: text/html, application/xhtml+xml, \*/\*\r\n

Accept-Language: en-US\r\n

User-Agent: Mozilla/5.0 (Windows NT 6.1; WOW64; Trident/7.0; rv:11.0) like Gecko\r\n

Accept-Encoding: gzip, deflate\r\n

Host: gaia.cs.umass.edu\r\n

DNT: 1\r\n

Connection: Keep-Alive\r\n

\r\n

[Full request URI: http://gaia.cs.umass.edu/ethereal-labs/INTRO-ethereal-file1.html]

[HTTP request 1/3]

[Response in frame: 90]

[Next request in frame: 92]

No. Time Source Destination Protocol Length Info

90 18:12:09.183448 128.119.245.12 192.168.1.10 HTTP 491 HTTP/1.1 200 OK (text/html)

Frame 90: 491 bytes on wire (3928 bits), 491 bytes captured (3928 bits) on interface \Device\NPF\_{26EC4540-1904-473B-8DA8-4B081DB4C0EF}, id 0

Ethernet II, Src: Cisco\_ed:72:3e (00:17:59:ed:72:3e), Dst: HewlettP\_1a:2a:d8 (00:24:81:1a:2a:d8)

Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.1.10

0100 .... = Version: 4

.... 0101 = Header Length: 20 bytes (5)

Differentiated Services Field: 0x88 (DSCP: AF41, ECN: Not-ECT)

Total Length: 477

Identification: 0x6bc9 (27593)

Flags: 0x40, Don't fragment

...0 0000 0000 0000 = Fragment Offset: 0

Time to Live: 41

Protocol: TCP (6)

Header Checksum: 0xac93 [validation disabled]

[Header checksum status: Unverified]

Source Address: 128.119.245.12

Destination Address: 192.168.1.10

Transmission Control Protocol, Src Port: 80, Dst Port: 62177, Seq: 1, Ack: 300, Len: 437

Source Port: 80

Destination Port: 62177

[Stream index: 3]

[Conversation completeness: Complete, WITH\_DATA (31)]

[TCP Segment Len: 437]

Sequence Number: 1 (relative sequence number)

Sequence Number (raw): 2594042444

[Next Sequence Number: 438 (relative sequence number)]

Acknowledgment Number: 300 (relative ack number)

Acknowledgment number (raw): 2679434245

0101 .... = Header Length: 20 bytes (5)

Flags: 0x018 (PSH, ACK)

Window: 237

[Calculated window size: 30336]

[Window size scaling factor: 128]

Checksum: 0x126c [unverified]

[Checksum Status: Unverified]

Urgent Pointer: 0

[Timestamps]

[SEQ/ACK analysis]

TCP payload (437 bytes)

Hypertext Transfer Protocol

HTTP/1.1 200 OK\r\n

Date: Sun, 21 Nov 2021 16:11:37 GMT\r\n

Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PHP/7.4.25 mod\_perl/2.0.11 Perl/v5.16.3\r\n

Last-Modified: Sun, 21 Nov 2021 06:59:02 GMT\r\n

ETag: "50-5d1470b16784f"\r\n

Accept-Ranges: bytes\r\n

Content-Length: 80\r\n

Keep-Alive: timeout=5, max=100\r\n

Connection: Keep-Alive\r\n

Content-Type: text/html; charset=UTF-8\r\n

\r\n

[HTTP response 1/3]

[Time since request: 0.375251000 seconds]

[Request in frame: 85]

[Next request in frame: 92]

[Next response in frame: 104]

[Request URI: http://gaia.cs.umass.edu/ethereal-labs/INTRO-ethereal-file1.html]

File Data: 80 bytes

Line-based text data: text/html (3 lines)

5) http 1.1 .  
6)English US  
7) ip ?

8)200

12) conditional GET return 304 status code if nothing changed since the previous GET request.