Detailed Packet Breakdown During Login

Samir KC

August 8, 2024

1 Detailed Packet Breakdown During Login

1.1 Ethernet Frame Header

The Ethernet frame header contains information about the source and destination MAC addresses, as well as the EtherType field, which indicates the type of the payload. In this case, the EtherType is set to ‘0x0800‘, which means the payload is an IPv4 packet.

Ethernet Frame Header

Field	Value	Description
Destination MAC	‘c4:48:fa:04:ed:c0‘	MAC address of the next hop device on the local network
Source MAC	‘5c:ba:ef:60:cf:55‘	MAC address of the sending device on the local network
EtherType	‘0x0800‘	Indicates that the payload is an IPv4 packet

1.2 IPv4 Header

The IPv4 header contains information about the version of the IP protocol, the header length, the total length of the packet, the protocol used in the payload (in this case, TCP), and the source and destination IP addresses.

IPv4 Header

Field	Value	Description
Version	‘4‘	Indicates this is an IPv4 packet
Header Length	‘5‘ (20 bytes)	Length of the IPv4 header
Total Length	‘592‘ bytes	Total length of the IPv4 packet
Protocol	‘6‘ (TCP)	Indicates that the next header is a TCP header
Source IP	‘192.168.1.103‘	IP address of the sending host
Destination IP	‘202.70.67.149‘	IP address of the receiving host

1.3 TCP Header

The TCP header contains information about the source and destination ports, the sequence number, the acknowledgment number, and various control flags. This information is used to establish and maintain the TCP connection between the client and the server.

TCP Header

Field	Value	Description
Source Port	‘81‘	Port number of the sending process/application
Destination Port	‘43539‘	Port number of the receiving process/application
Sequence Number	‘0x04274be4‘	Sequence number of the TCP segment
Acknowledgment Number	‘0xd292d218‘	Next expected sequence number
Data Offset, Reserved, Flags	‘4‘	TCP header length and control flags
Window Size	‘107‘	Available buffer space at the receiver
Checksum	‘0xd22d‘	Checksum for error detection
Urgent Pointer	‘0‘	Pointer to urgent data (not used)

1.4 HTTP Request

The HTTP request includes the request method (POST), the request URI (‘/Login‘), the HTTP version (1.1), and various headers such as Host, Connection, Content-Length, and Accept. These headers provide information about the client, the connection, and the request body.

HTTP Request

Field	Value	Description
Request Method	‘POST‘	HTTP request method used for the login
Request URI	‘/Login‘	Resource being accessed for the login
HTTP Version	‘HTTP/1.1‘	Version of the HTTP protocol used
Host	‘exam.ioe.edu.np:81‘	Hostname and port of the destination server
Connection	‘keep-alive‘	Indicates that the connection should be kept alive
Content-Length	‘51‘	Length of the request body
Accept	‘*/*‘	Indicates that the client can accept any response media type