

1. Do something such that your packet need to be fragmented. How do you know which is the first fragment of the entire datagram? Which is the last fragment? Get the individual offsets of fragments for the complete datagram.

The screenshot shows a Wireshark packet capture on interface eth0. The packet list pane shows several packets, with packet #66 selected. The packet details pane shows the structure of the selected packet:

- Frame 65: 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits) on interface eth0, id 0
- Ethernet II, Src: VMware_a3:43:52 (00:0c:29:a3:43:52), Dst: VMware_f0:2b:45 (00:50:56:f0:2b:45)
- Internet Protocol Version 4, Src: 192.168.245.133, Dst: 192.168.1.8
- 0100 = Version: 4
- 0101 = Header Length: 20 bytes (5)
- Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
- Total Length: 1500
- Identification: 0x5c69 (23657)
- Flags: 0x2000, More fragments
- Fragment offset: 0
- Time to live: 64
- Protocol: ICMP (1)
- Header checksum: 0x80d9 [validation disabled]
- [Header checksum status: Unverified]
- Source: 192.168.245.133
- Destination: 192.168.1.8
- [Reassembled IPv4 in frame: 66]

A green arrow points from the "Fragment offset: 0" field to a text box stating: "0 determines the first fragment of the entire datagram". A red arrow points from the selected packet in the packet list to a box labeled "Selected Packet". A purple box contains the text: "The Individual fragment offset for this packet is 0".

The screenshot shows a Wireshark packet capture on interface eth0. The packet list pane shows several packets, with packet #68 selected. The packet details pane shows the structure of the selected packet:

- Frame 67: 62 bytes on wire (496 bits), 62 bytes captured (496 bits) on interface eth0, id 0
- Ethernet II, Src: VMware_f0:2b:45 (00:50:56:f0:2b:45), Dst: VMware_a3:43:52 (00:0c:29:a3:43:52)
- Internet Protocol Version 4, Src: 192.168.1.8, Dst: 192.168.245.133
- 0100 = Version: 4
- 0101 = Header Length: 20 bytes (5)
- Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
- Total Length: 48
- Identification: 0xff32 (65330)
- Flags: 0x00b9
- Fragment offset: 1480
- Time to live: 128
- Protocol: ICMP (1)
- Header checksum: 0xc302 [validation disabled]
- [Header checksum status: Unverified]
- Source: 192.168.1.8
- Destination: 192.168.245.133
- [Reassembled IPv4 in frame: 68]

A green arrow points from the "Fragment offset: 1480" field to a text box stating: "The fragment offset for this packet is 1480". A red arrow points from the selected packet in the packet list to a box labeled "Selected Packet". A red box contains the text: "Selected Packet which is also the next and the last fragment of the previously mentioned figure."

2. What fields in the IP header change for each fragment in question #1

Changes between each fragments of an IP header are:

- a)Total length
- b)Identification
- c)Flags
- d)Fragment offset
- e)Time to live
- f)Header checksum
- g)Source
- h)Destination
- f)Options