1. Select the first ICMP Echo Request message sent by your computer, expand the Internet Protocol part of the packet in the packet details window, and print this.

| *Local Area Connection [Wireshark 1.10.6 (v1.10.6 from master-1.10)]  |   |
|---|---|
| <u>File E</u> dit <u>V</u> iew <u>Go</u> <u>C</u> apture <u>A</u> nalyze <u>S</u> tatistics Telephony <u>T</u> ools Interna   | als <u>H</u> elp  |
| ● ◎ ◢ ■ ∅ ⊨ ≞ ☆ ஜ ! ९ ♦ ♦ ₽ 7 쏘 目   | 🗐 🕀 Q 🔍 🖻 l 🎬 🗵 🍢 💃 🙀   |
|   |   |
|   | opression Clear Apply Save  |
|   | <pre>rotocol Length Info CCMP 70 Echo (ping) request id=0x0001, seq=241/61696, tt]</pre>                                  |
| 110 1.42333800 130.215.16.2 130.215.16.215 I  | ICMP 70 Time-to-live exceeded (Time to live exceeded in tr  |
|   | ICMP 70 Echo (ping) request id=0x0001, seq=242/61952, ttl =<br>TCMP 70 Time-to-live exceeded (Time to live exceeded in tr |
| 122 1.50317500 130.215.16.215 128.125.253.146 I   | ICMP 70 Echo (ping) request id=0x0001, seq=243/62208, tt1   |
|   | ICMP 70 Time-to-live exceeded (Time to live exceeded in tr<br>ICMP 70 Echo (ping) request id=0x0001, seq=244/62464, ttl   |
|   | ICMP 110 Time-to-live exceeded (Time to live exceeded in tr   |
|   | ICMP 70 Echo (ping) request id=0x0001, seq=245/62720, tt]   |
|   | ICMP 70 Time-to-live exceeded (Time to live exceeded in tr<br>ICMP 70 Echo (ping) request id=0x0001, seq=246/62976, ttl   |
|   | ICMP 70 Time-to-live exceeded (Time to live exceeded in tr  |
|   | ICMP 70 Echo (ping) request id=0x0001, seq=247/63232, ttl<br>ICMP 70 Time-to-live exceeded (Time to live exceeded in tr   |
| 153 1.70337400 130.215.16.215 128.125.253.146 I   | ICMP 70 Echo (ping) request id=0x0001, seq=248/63488, ttl   |
|   | ICMP 70 Echo (ping) request id=0x0001, seq=249/63744, ttl<br>ICMP 70 Time-to-live exceeded (Time to live exceeded in tr   |
|   | ICMP 70 Echo (ping) request id=0x0001, seq=250/64000, tt]   |
|   | ICMP 70 Echo (ping) request id=0x0001, seq=251/64256, ttl<br>ICMP 70 Time-to-live exceeded (Time to live exceeded in tr   |
|   | ICMP 70 Time-to-live exceeded (Time to live exceeded in tr<br>ICMP 70 Echo (ping) request id=0x0001, seq=252/64512, ttl   |
| <pre>     Differentiated Services Field: 0x00 (DSCP 0x00: Defau<br/>Total Length: 56<br/>Identification: 0x4115 (16661)     Flags: 0x00     0 = Reserved bit: Not set<br/>.0 = Don't fragment: Not set<br/>.0 = More fragments: Not set<br/>Fragment offset: 0     Time to live: 1 </pre>   | IT; ECN: 0x00: NOT-ECT (NOT ECN-Capable Transport))   |
| <pre>Protocol: ICMP (1) Header checksum: 0x0000 [validation disabled] Source: 130.215.16.215 (130.215.16.215) Destination: 128.125.253.146 (128.125.253.146) [Source GeoIP: Unknown] [Destination GeoIP: Unknown] Internet Control Message Protocol</pre>   |   |
|   |   |
| 0010 00 38 41 15 00 00 01 01 00 00 82 d7 10 d7 80 7d<br>0020 fd 92 08 00 23 1d 00 01 00 f1 33 45 50 69 6e 67  | ^0 gE.<br>.8A   |
| 0010         00         38         41         15         00         00         01         01         00         00         82         d7         10         d7         80         7d           0020         fd         92         08         00         23         1d         00         01         10         11         33         45         50         69         66         67           0030         50         6c         67         74         53         74         61         6e         64         61         72         64         33 | .8A}<br>#   |

- 2. Within the IP packet header, what is the value in the upper layer protocol field? ICMP (1)
- 3. How many bytes are in the IP header? How many bytes are in the payload of the IP datagram? Explain how you determined the number of payload bytes.

Header bytes: 20 (as seen in screenshot)

Payload bytes: 36 (total length 56 minus the 20 header bytes = 36)

4. Has this IP datagram been fragmented? Explain how you determined whether or not the datagram has been fragmented.

From the previous screenshot, we do not see any IPv4 fragments. We will see these later when we transmit longer ICMP echo requests.

5. Which fields in the IP datagram always change from one datagram to the next within this series of ICMP messages sent by your computer?

Identification field is incrementing.

Time to live is also incrementing.

6. Which of the fields must stay constant? Which fields must change? Why?

The following fields remain constant:

- version (IPv4 always used)
- header length (doesn't change since we are always using IPv4)
- source IP (my computer's IP address doesn't change)
- destination IP (usc.edu's IP address doesn't change)
- differentiated services (same protocol every time)
- upper layer protocol (same protocol every time)
- header checksum (verification disabled in my tests)

The following fields change:

- Identification field is incrementing (each IP datagram has a different ID)
- Time to live is also incrementing (this is how trace route works, as discussed in the assignment)
- 7. Describe the pattern you see in the values in the Identification field of the IP datagram. They are incrementing with each datagram.
- 8. What is the value in the Identification field and the TTL field?

My nearest hop router was 130.215.16.32. From the screenshot below, we see that

- 56 byte pings: Identification = 0 and TTL = 255
- 2000 byte pings: Identification = 0 and TTL = 255
- 3500 byte pings: Identification = 0 and TTL = 255

See three screenshots below.

| □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □   |   |
|---|---|
| <u>File Edit View Co Capture Analyze Statistics Telephony Tools Internals Help</u>  |   |
| ● ● 🖉 📕 🥂   🖻 🕷 20   9, 🗢 🔶 7 👱   🗏 🗐 🖳 9, 9, 9, 10   11 🙀 10 15 16 15  |   |
| Filter: icmp   Expression Clear Apply Save  |   |
| No. Time Source V Destination Protocol Length Info  | Å |
| 3649         52.268374000         128.125.253.146         130.215.16.215         ICMP         1514 Echo (ping) reply         id=0x0001, seq=281/6401, ttl=243           3650         52.308392000         128.125.253.146         130.215.16.215         ICMP         1514 Echo (ping) reply         id=0x0001, seq=281/6401, ttl=243   |   |
| 1141.463579000         130.215.0.74         130.215.16.215         ICMP         70 Time-to-live exceeded (Time to live exceeded in transit)           2567 35.343612000         130.215.0.74         130.215.16.215         ICMP         70 Time-to-live exceeded (Time to live exceeded in transit)           3580 51.739410000         130.215.0.74         130.215.16.215         ICMP         70 Time-to-live exceeded (Time to live exceeded in transit)   |   |
| 110         1.423338000         130.215.16.2         130.215.16.215         ICMP         70 Time-to-live exceeded (Time to live exceeded in transit)           2551         35.310137000         130.215.16.2         130.215.16.215         ICMP         70 Time-to-live exceeded (Time to live exceeded in transit)   |   |
| 3570         51.694594000         130.215.16.2         130.215.16.215         ICMP         70         Time-to-live exceeded (Time to live exceeded in transit)           109         1.423126000         130.215.16.215         128.125.253.146         ICMP         70         Echo (ping) request id=0x0001, seq=241/61696, ttl=1   | - |
| Therenet Protocol Version 4, Src: 130.215.16.2 (130.215.16.2), Dst: 130.215.16.215 (130.215.16.215)<br>Version: 4<br>Header length: 20 bytes<br>> Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00: Not-ECT (Not ECN-Capable Transport))<br>Total Length: 56<br>Identification: 0x0000 (0)<br>> Flags: 0x00<br>Fragment offset: 0<br>Time to live: 255<br>Protocol: ICMP (1)<br>> Header checksum: 0x953d [validation disabled]<br>Source: 130.215.16.2 (130.215.16.2)<br>Destination: 130.215.16.215 (130.215.16.2)5<br>Fource GenTP: Unknown  |   |
| 0010       00       38       00       00       00       f1       10       02       82       d7       10       d2       82       d2       < |   |
| ● ∑ File: "/Users/drb/Dropbox/ Packets: 3707 · Displayed: 84 (2.3%) · Load time: 0:00.055 Profile: Default  |   |

|   |   | antura Analuza   |   | ab5trace.pcapng [Wireshark 1.10.6 (v1.10.6 from master-1.10)]  |
|---|---|--|---|--|
|   | it view <u>Go C</u>   | apture <u>A</u> nalyze   | statistics relepho                                  | phony <u>T</u> ools <u>Internals</u> <u>H</u> elp              |
| • •   |   | 🖻 🗋 🗙 🕄  | 🔍 🔶 🐳 ≼   | 🥪 春 🛃 🗐 🕞 I 🗨 🔍 🔍 📅 I 🎆 🕅 🛅 ‰ I 🔀                              |
| ilter:  | icmp  |  | ▼ Ex  | Expression Clear Apply Save                                    |
| lo.   | Time  | Source 🗸   | Destination   | Protocol Length Info   |
| 364   | 19 52.268374000   | 128.125.253.146  | 130.215.16.215                                      | 5 ICMP 1514 Echo (ping) reply id=0x0001, seq=281/6401, ttl=243 |
|   | 50 52.308392000   | 128.125.253.146  | 130.215.16.215                                      |  |
|   | L4 1.463579000  | 130.215.0.74   | 130.215.16.215                                      |  |
|   | 57 35.343612000   | 130.215.0.74   | 130.215.16.215                                      |  |
|   | 30 51.739410000   | 130.215.0.74   | 130.215.16.215                                      |  |
|   | 1.423338000   | 130.215.16.2   | 130.215.16.215                                      |  |
|   | 51 35.310137000<br>70 51.694594000  | 130.215.16.2<br>130.215.16.2   | 130.215.16.215                                      |  |
|   | 0 51.894594000  | 130, 215, 16, 215  | 130.215.16.215<br>128.125.253.146                   |  |
|   |   | 150.215.10.215   | 128.125.255.140                                     |  |
| Tot;<br>Iden<br>Flag<br>Frag<br>Tim<br>Pro<br>Pro | al Length: 56<br>ntification: 0x6<br>gs: 0x00<br>gment offset: 0<br>e to live: 255<br>tocol: ICMP (1)<br>der checksum: 0> | 0000 (0)<br>(953d [validation (  |   | ault; ECN: 0x00: Not-ECT (Not ECN-Capable Transport))          |
|   |   | 2 (130.215.16.2)<br>15.16.215 (130.215.                                      | .16.215)  |  |
|   | urce GeoTP: Unkr  |  |   |  |
| 010 00<br>020 10                                  | 38 00 00 00 00  | 00 23 9c 94 97 f<br>ff 01 95 3d 82 d<br>00 00 00 00 45 0<br>82 d7 10 d7 80 7 | 7 10 02 82 d7 .8.<br>0 05 dc 41 3d<br>d fd 92 08 00 | .0g#E.<br>.8EA=<br>A&}   |
|   | 48 00 01 01 0d  | 02 0, 10 0, 00 ,   | fH.   | fH   |

|   | )  |   | X lab5  | Strace.pcapng [Wireshark 1.10.6 (v1.10.6 from master-1.10)]  |     |
|---|--|---|---|--|-----|
| <u>File</u>   | dit <u>V</u> iew <u>G</u> o <u>C</u>   | apture <u>A</u> nalyze  | Statistics Teleph   | hony <u>T</u> ools <u>I</u> nternals <u>H</u> elp  |     |
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| Filter:   | icmp   |   | <b>▼</b> E  | Expression Clear Apply Save  |     |
| No.   | Time   | Source  | Destination   | Protocol Length Info   | -   |
|   | 649 52.268374000<br>550 52.308392000   |   | 130.215.16.215<br>130.215.16.215  | ICMP 1514 Echo (ping) reply id=0x0001, seq=281/6401, ttl=243<br>ICMP 1514 Echo (ping) reply id=0x0001, seq=282/6657, ttl=243   | l l |
| 25  | 14 1.463579000<br>667 35.343612000<br>580 51.739410000   |   | 130.215.16.215<br>130.215.16.215<br>130.215.16.215  | ICMP         70 Time-to-live exceeded (Time to live exceeded in transit)           ICMP         70 Time-to-live exceeded (Time to live exceeded in transit)           ICMP         70 Time-to-live exceeded (Time to live exceeded in transit) |     |
| 25  | 10 1.423338000<br>51 35.310137000<br>570 51.694594000  | 130.215.16.2<br>130.215.16.2<br>130.215.16.2  | 130.215.16.215<br>130.215.16.215<br>130.215.16.215  | ICMP 70 Time-to-live exceeded (Time to live exceeded in transit)<br>ICMP 70 Time-to-live exceeded (Time to live exceeded in transit)<br>ICMP 70 Time-to-live exceeded (Time to live exceeded in transit)                                       |     |
|   | 1.423126000  | 130.215.16.215  | 128.125.253.146   | ICMP 70 Echo (ping) request id=0x0001, seq=241/61696, ttl=1  |     |
| Þ Ether<br>⊽ Inter  | net II, Src: Jun   | iperN_94:97:f0 (0   | 0:23:9c:94:97:f0),  | ed (560 bits) on interface 0<br>Dst: BiostarM_06:14:a6 (00:30:67:06:14:a6)<br>16.2), Dst: 130.215.16.215 (130.215.16.215)  |     |
| ▷ Ether<br>Inter<br>Ver<br>Hez<br>▷ Dit<br>Idd<br>▷ Fla<br>Fra<br>Tir<br>Prc<br>▷ Hez<br>Son<br>Des<br>rc<  | rnet II, Src: Jun<br>rnet Protocol Ver<br>ader length: 20 b<br>fferentiated Serv<br>tal Length: 56<br>entification: 0x0<br>ags: 0x00<br>agment offset: 0<br>me to live: 255<br>otocol: ICMP (1)<br>ader checksum: 0x<br>urce: 130.215.16.<br>stination: 130.22<br>urce GanTP- Hokn<br>0 30 67 06 14 a6   | iperN_94:97:f0 (0<br>sion 4, Src: 130.<br>ytes<br>ices Field: 0x00<br>000 (0)<br>953d [validation<br>2 (130.215.16.2)<br>5.16.215 (130.215<br>rown1<br>00 23 9c 94 97 7 | 0:23:9c:94:97:f0),<br>215.16.2 (130.215.<br>(DSCP 0x00: Defaul<br>disabled]<br>.16.215)<br>f0 08 00 45 00 .0  | Dst: BiostarM_06:14:a6 (00:30:67:06:14:a6)<br>16.2), Dst: 130.215.16.215 (130.215.16.215)<br>Lt; ECN: 0x00: Not-ECT (Not ECN-Capable Transport))<br>0g#E.  |     |
| <ul> <li>▷ Ether</li> <li>▷ Inter</li> <li>∨ er</li> <li>→ Dii</li> <li>→ Dii</li> <li>→ Fiz</li> <li>→ Fiz</li></ul> | <pre>rnet II, Src: Jun rnet Protocol Ver store in the second seco</pre> | <pre>iperN_94:97:f0 (0 sion 4, Src: 130. ytes ices Field: 0x00 000 (0) 953d [validation 2 (130.215.16.2) 5.16.215 (130.215</pre>  | 0:23:9c:94:97:f0),<br>215.16.2 (130.215.<br>(DSCP 0x00: Defaul<br>disabled]<br>.16.215)<br>To 08 00 45 00 .6<br>To 10 02 82 d7 .8<br>10 05 dc 41 2d<br>df df 92 08 00 | Dst: BiostarM_06:14:a6 (00:30:67:06:14:a6)<br>16.2), Dst: 130.215.16.215 (130.215.16.215)<br>Lt; ECN: 0x00: Not-ECT (Not ECN-Capable Transport))   |     |

9. Do these values remain unchanged for all of the ICMP TTL-exceeded replies sent to your computer by the nearest (first hop) router? Why?

In my test, these fields do not change.

10. Find the first ICMP Echo Request message that was sent by your computer after you changed the Packet Size in pingplotter to be 2000. Has that message been fragmented across more than one IP datagram?

See screenshot below. Note the presence of the IPv4 fragments. I had the setting "Reassemble fragmented IPv4 Datagrams" on for this part, so Wireshark shows the fragments together.

| *Local Area Connection [Wireshark 1.10.6 (v1.10)   | 6 from master-1.10)]   |                    |                |         |                | -             |                                  | • X         |
|--|--|--------------------|----------------|---------|----------------|---------------|----------------------------------|-------------|
| <u>File Edit View Go Capture Analyze Statisti</u>  |  | Internals Help     |                |         |                | _             |                                  |             |
| ● ● <b>▲</b> ■ <u>▲</u>   ⊨ 🖬 X 🛃   <  | _  |                    | 0 11 17        |         | 1 🖪 🖗          | 1             |                                  |             |
|  |  |                    |                |         | - <u></u>      | 8536          |                                  |             |
| Filter: ip.addr == 130.215.16.215 && icmp  |  | <u> </u>           | Clear Apply    | Save    |                |               |                                  |             |
| No. Time Source  | Destination  | Protocol L         |                |         | e exceede      | ea (Time co   | TIVE exceeded                    | - uu - uu - |
| 173 1.90450500 130.215.16.215  | 128.125.253.146  | ICMP               |                |         |                |               | , seq=253/6476                   |             |
| 174 1.90997800 68.181.194.72<br>178 1.94551200 130.215.16.215  | 130.215.16.215<br>128.125.253.146  | ICMP<br>ICMP       |                |         |                |               | live exceeded<br>seq=254/6502    |             |
| 179 1.94966000 128.125.253.146   | 130.215.16.215   | ICMP               | 70 Echo        |         |                |               | , seq=252/6451                   |             |
| 181 1.99069500 128.125.253.146<br>186 2.03174900 128.125.253.146   | 130.215.16.215<br>130.215.16.215   | ICMP<br>ICMP       |                |         | reply<br>reply |               | , seq=253/6476<br>, seq=254/6502 |             |
| 2550 35.3030130130.215.16.215  | 128.125.253.146  | ICMP               |                |         |                |               | seq=255/6528                     |             |
| 2551 35. 3101370 130. 215. 16. 2<br>2566 35. 3430330 130. 215. 16. 215   | 130.215.16.215<br>128.125.253.146  | ICMP<br>ICMP       |                |         |                |               | live exceeded<br>, seq=256/1, t  |             |
| 2567 35.3436120130.215.0.74  | 130.215.16.215   | ICMP               | 70 Time-       | to-live | e exceede      | ed (Time to   | live exceeded                    | l in tr     |
| 2575 35.3830610 130.215.16.215<br>2576 35.3857800 130.215.7.17   | 128.125.253.146<br>130.215.16.215  | ICMP<br>ICMP       |                |         |                |               | , seq=257/257,<br>live exceeded  |             |
| 2585 35.4230980 130.215.16.215   | 128.125.253.146  | ICMP               |                |         |                |               | , seq=258/513,                   |             |
| 2586 35.4285710 192.5.89.241<br>2589 35.4631230 130.215.16.215   | 130.215.16.215<br>128.125.253.146  | ICMP<br>ICMP       |                |         |                |               | live exceeded<br>seq=259/769,    |             |
| 2590 35.4734420 192.5.89.222   | 130.215.16.215   | ICMP               |                |         |                |               | live exceeded                    |             |
| 2592 35.5032050 130.215.16.215   | 128.125.253.146  | ICMP               |                |         |                |               | , seq=260/1025                   |             |
| 2605 35.5199440 198.71.45.1<br>2607 35.5432210 130.215.16.215  | 130.215.16.215<br>128.125.253.146  | ICMP<br>ICMP       |                |         |                |               | live exceeded<br>seq=261/1281    |             |
| 2608 35.5739920 198.71.45.6  | 130.215.16.215   | ICMP               | 70 Time-       | to-live | e exceede      | ed (Time to   | live exceeded                    | in tr       |
| 2611 35.5842000 130.215.16.215   | 128.125.253.146  | TCMP               |                |         |                |               | . sea=262/1537                   | . ++1=      |
| <pre>Header length: 20 bytes   Differentiated Services Field:   Total Length: 520   Identification: 0x412d (16685)   Flags: 0x00     0 = Reserved bit: Not     .0 = Don't fragment: No     .0 = More fragments: No     Fragment offset: 1480   Time to live: 1     Protocol: ICMP (1)   Header checksum: 0x0000 [validat     Source: 130.215.16.215 (130.215     Destination: 128.125.253.146 (1.     [Source GeoIP: Unknown]     [Destination GeoIP: Unknown]     [2 IPv4 Fragments (1980 bytes):         [Frame: 2549, payload: 0-1479         [Frame: 2549, payload: 0-1479         [Fragment count: 2]         [Reassembled IPv4 length: 1988         [Reassembled IPv4 data: 08000     ] Internet Control Message Protocol </pre> | <pre>set ot set ot set tion disabled] .16.215) 28.125.253.146) #2549(1480), #251 (1480 bytes)] 979 (500 bytes)] 0]</pre> | 50(500)]           |                |         | -              | -Capable Tra  | ansport))                        |             |
| 0000         00         00         5e         00         01         01         00         30         67         0           0010         02         08         41         2d         00         b9         01         01         00         0           0020         fd         92         6e         64         61         72         64         33         2e         3  | 0 82 d7 10 d7 80 🛛   | 7d                 | 0 gE.          |         |                |               |                                  | *           |
| Frame (534 bytes) Reassembled IPv4 (1980 bytes)  |  |                    |                |         |                |               |                                  |             |
| 😑 💅 Frame (frame), 534 bytes   | Packets: 3707 · Displaye   | d: 84 (2.3%) · Dro | pped: 0 (0.0%) |         |                | Profile: Defa | ault                             |             |

11. Print out the first fragment of the fragmented IP datagram. What information in the IP header indicates that the datagram been fragmented? What information in the IP header indicates whether this is the first fragment versus a latter fragment? How long is this IP datagram?

I had to turn off the setting "Reassemble fragmented IPv4 Datagrams" to get this to work. See screenshot below. The "more fragments" bit is set, indicating the datagram been fragmented and there are more fragments coming. The "Fragment offset" is zero, indicating this is the first fragment. The total length of this IP datagram is 1500 bytes.

| *Local Area Connection [Wireshark 1.10.6 (v1.   | 10.6 from master-1.10)]  |  |   |                                    |                        |           |           |
|---|--|--|---|------------------------------------|------------------------|-----------|-----------|
| <u>File E</u> dit <u>V</u> iew <u>G</u> o <u>C</u> apture <u>A</u> nalyze <u>S</u> tat  | istics Telephon <u>y</u> ools  | Internals <u>H</u> elp   |   |                                    | _                      |           |           |
| 0 0 🚄 🔳 🔏   🖻 🛅 💥 🛃   C   | 🔪 🗢 🏟 😜 ዥ 👱  |  | 0, 0, 🖭   🎬 🕅   | 🍢 🔆 🖪                              | ġ                      |           |           |
| Filter: ip.addr == 130.215.16.215   |  | Expression   | Clear Apply Save  |                                    |                        |           |           |
| o. Time Source  | Destination  | Protocol Ler   |   |                                    |                        |           |           |
| 2549 35.3029980 130.215.16.215<br>2550 35.3030130 130.215.16.215  | 128.125.253.146<br>128.125.253.146   | ICMP 1<br>IPV4   | 1514 Echo (ping) r<br>534 Fragmented IP   |                                    |                        |           |           |
| 2551 35. 3101370 130. 215. 16. 2  | 130.215.16.215   | ICMP   | 70 Time-to-live   |                                    |                        |           |           |
| 2565 35.3430210130.215.16.215<br>2566 35.3430330130.215.16.215  | 128.125.253.146  | ICMP 1<br>IPv4   | 1514 Echo (ping) r  |                                    |                        |           |           |
| 2567 35.3436120130.215.0.74   | 128.125.253.146<br>130.215.16.215  | ICMP   | 534 Fragmented IP<br>70 Time-to-live  |                                    |                        |           |           |
| 2574 35.3830450 130.215.16.215  | 128.125.253.146  |  | 1514 Echo (ping) r  |                                    |                        |           |           |
| 2575 35.3830610130.215.16.215<br>2576 35.3857800130.215.7.17  | 128.125.253.146<br>130.215.16.215  | IPv4<br>ICMP   | 534 Fragmented IP<br>70 Time-to-live  |                                    |                        |           |           |
| 2584 35.4230820130.215.16.215   | 128.125.253.146  | ICMP 1   | 1514 Echo (ping) r  | equest i                           | d=0x0001,              | seq=258/  | 513, ttl= |
| 2585 35.4230980 130.215.16.215<br>2586 35.4285710 192.5.89.241  | 128.125.253.146<br>130.215.16.215  | IPv4<br>ICMP   | 534 Fragmented IP<br>110 Time-to-live   |                                    |                        |           |           |
| 2588 35.4631120 130.215.16.215  | 128.125.253.146  |  | 1514 Echo (ping) r  |                                    |                        |           |           |
| 2589 35.4631230 130.215.16.215  | 128.125.253.146  | IPv4   | 534 Fragmented IP   |                                    |                        |           |           |
| 2590 35.4734420 192.5.89.222<br>2591 35.5031940 130.215.16.215  | 130.215.16.215<br>128.125.253.146  | ICMP<br>ICMP 1   | 70 Time-to-live<br>L514 Echo (ping) r   |                                    |                        |           |           |
| 2592 35.5032050130.215.16.215   | 128.125.253.146  | IPv4   | 534 Fragmented IP   | protocol                           | (proto=1               | CMP 1, of | f=1480, I |
| 2605 35.5199440 198.71.45.1<br>2606 35.5431920 130.215.16.215   | 130.215.16.215<br>128.125.253.146  | ICMP<br>ICMP 1   | 70 Time-to-live<br>1514 Echo (ping) r   |                                    |                        |           |           |
| 2607 35.5432210 130.215.16.215  | 128.125.253.146  | IPv4   | 534 Fragmented IP   |                                    |                        |           |           |
|   | 130.215.16.215   | ICMP   | 70 Time-to-live   |                                    | (Time to               | live exce | eded in t |
| 2608 35.5739920 198.71.45.6<br>Frame 2549: 1514 bytes on wire (<br>Ethernet II, Src: BiostarM_06:14<br>Internet Protocol Version 4, Src<br>Version: 4<br>Header length: 20 bytes<br>⊕ Differentiated Services Field:<br>Total Length: 1500  | (12112 bits), 1514 b<br>:a6 (00:30:67:06:14<br>: 130.215.16.215 (1   | oytes capture<br>4:a6), Dst: I<br>L30.215.16.21  | ETF-VRRP-VRID_01<br>5), Dst: 128.125.   | interfac<br>(00:00:5e<br>253.146 ( | :00:01:01<br>128.125.2 | 53.146)   |           |
| <pre>Frame 2549: 1514 bytes on wire (<br/>Ethernet II, Src: BiostarM_06:14<br/>Internet Protocol Version 4, Src<br/>Version: 4<br/>Header length: 20 bytes<br/>Differentiated Services Field:<br/>Total Length: 1500<br/>Identification: 0x412d (16685)<br/>Flags: 0x01 (More Fragments)<br/>0 = Reserved bit: No<br/>.0 = Don't fragment:<br/>.1 = More fragments:<br/>Fragment offset: 0</pre>  | (12112 bits), 1514 b<br>1:a6 (00:30:67:06:14<br>1: 130.215.16.215 (1<br>1: 0x00 (DSCP 0x00: 1<br>0)<br>0)<br>0)<br>0)<br>0)<br>0)<br>0)<br>0)<br>0)<br>0)  | oytes capture<br>4:a6), Dst: I<br>L30.215.16.21  | ed (12112 bits) on<br>ETF-VRRP-VRID_01<br>5), Dst: 128.125.   | interfac<br>(00:00:5e<br>253.146 ( | :00:01:01<br>128.125.2 | 53.146)   |           |
| Frame 2549: 1514 bytes on wire (<br>Ethernet II, Src: BiostarM_06:14<br>Internet Protocol Version 4, Src<br>Version: 4<br>Header length: 20 bytes<br>Differentiated Services Field:<br>Total Length: 1500<br>Identification: 0x412d (16685)<br>Flags: 0x01 (More Fragments)<br>0 = Reserved bit: No<br>.0 = Roore fragments:<br>.1 = More fragments:<br>Fragment offset: 0<br>Time to live: 1<br>Protocol: ICMP (1)<br>Header checksum: 0x0000 [valid   | (12112 bits), 1514 b<br>1:a6 (00:30:67:06:14<br>1: 130.215.16.215 (1<br>1: 0x00 (DSCP 0x00: n<br>1)<br>1: set<br>Not set<br>Set<br>dation disabled]  | oytes capture<br>4:a6), Dst: I<br>L30.215.16.21  | ed (12112 bits) on<br>ETF-VRRP-VRID_01<br>5), Dst: 128.125.   | interfac<br>(00:00:5e<br>253.146 ( | :00:01:01<br>128.125.2 | 53.146)   |           |
| <pre>Frame 2549: 1514 bytes on wire (<br/>Ethernet II, Src: BiostarM_06:14<br/>Internet Protocol Version 4, Src<br/>Version: 4<br/>Header length: 20 bytes<br/>B Differentiated Services Field:<br/>Total Length: 1500<br/>Identification: 0x412d (16685)<br/>G Flags: 0x01 (More Fragments)<br/>0 = Reserved bit: No<br/>.0 = Don't fragments:<br/>Fragment offset: 0<br/>B Time to live: 1<br/>Protocol: ICMP (1)<br/>B Header checksum: 0x0000 [valid<br/>Source: 130.215.16.215 (130.21)<br/>Destination: 128.125.253.146 (0)</pre>   | <pre>(12112 bits), 1514 b<br/>1:a6 (00:30:67:06:14<br/>1: 130.215.16.215 (1<br/>1: 0x00 (DSCP 0x00: n<br/>1: 0x00 (DSCP 0x00: n<br/>1: 0x00 set<br/>Not set<br/>Set<br/>dation disabled]<br/>1:5.16.215)</pre>   | oytes capture<br>4:a6), Dst: I<br>L30.215.16.21  | ed (12112 bits) on<br>ETF-VRRP-VRID_01<br>5), Dst: 128.125.   | interfac<br>(00:00:5e<br>253.146 ( | :00:01:01<br>128.125.2 | 53.146)   |           |
| <pre>Frame 2549: 1514 bytes on wire (<br/>Ethernet II, Src: BiostarM_06:14<br/>Internet Protocol Version 4, Src<br/>Version: 4<br/>Header length: 20 bytes<br/>Differentiated Services Field:<br/>Total Length: 1500<br/>Identification: 0x412d (16685)<br/>Flags: 0x01 (More Fragments)<br/>0 = Reserved bit: No<br/>.0 = Don't fragments:<br/>.1 = More fragments:<br/>Fragment offset: 0<br/>Time to live: 1<br/>Protocol: ICMP (1)<br/>Header checksum: 0x0000 [valid<br/>Source: 130.215.16.215 (130.21<br/>Destination: 128.125.253.146 (<br/>[Source GeoIP: Unknown]</pre>   | <pre>(12112 bits), 1514 b<br/>1:a6 (00:30:67:06:14<br/>1: 130.215.16.215 (1<br/>1: 0x00 (DSCP 0x00: n<br/>1: 0x00 (DSCP 0x00: n<br/>1: 0x00 set<br/>Not set<br/>Set<br/>dation disabled]<br/>1:5.16.215)</pre>   | oytes capture<br>4:a6), Dst: I<br>L30.215.16.21  | ed (12112 bits) on<br>ETF-VRRP-VRID_01<br>5), Dst: 128.125.   | interfac<br>(00:00:5e<br>253.146 ( | :00:01:01<br>128.125.2 | 53.146)   |           |
| <pre>Frame 2549: 1514 bytes on wire (<br/>Ethernet II, Src: BiostarM_06:14<br/>Internet Protocol Version 4, Src<br/>Version: 4<br/>Header length: 20 bytes<br/>Differentiated Services Field:<br/>Total Length: 1500<br/>Identification: 0x412d (16685)<br/>Flags: 0x01 (More Fragments)<br/>0 = Reserved bit: No<br/>.0 = Don't fragments:<br/>.1 = More fragments:<br/>Fragment offset: 0<br/>Time to live: 1<br/>Protocol: ICMP (1)<br/>Header checksum: 0x0000 [valid<br/>Source: 130.215.16.215 (130.21<br/>Destination: 128.125.253.146 (<br/>[Source GeoIP: Unknown]<br/>[Destination GeoIP: Unknown]</pre>  | <pre>(12112 bits), 1514 b<br/>1:a6 (00:30:67:06:14<br/>1: 130.215.16.215 (1<br/>1: 0x00 (DSCP 0x00: 1<br/>1)<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>1<br/>1<br/>1<br/>1<br/>1<br/>1<br/>1<br/>1</pre>   | oytes capture<br>4:a6), Dst: I<br>L30.215.16.21  | ed (12112 bits) on<br>ETF-VRRP-VRID_01<br>5), Dst: 128.125.   | interfac<br>(00:00:5e<br>253.146 ( | :00:01:01<br>128.125.2 | 53.146)   |           |
| <pre>Frame 2549: 1514 bytes on wire (<br/>Ethernet II, Src: BiostarM_06:14<br/>Internet Protocol Version 4, Src<br/>Version: 4<br/>Header length: 20 bytes<br/>Differentiated Services Field:<br/>Total Length: 1500<br/>Identification: 0x412d (16685)<br/>Flags: 0x01 (More Fragments)<br/>0 = Reserved bit: No<br/>.0 = Don't fragments:<br/>.1 = More fragments:<br/>Fragment offset: 0<br/>Time to live: 1<br/>Protocol: ICMP (1)<br/>Header checksum: 0x0000 [valid<br/>Source: 130.215.16.215 (130.21<br/>Destination: 128.125.253.146 (<br/>[Source GeoIP: Unknown]<br/>[Destination GeoIP: Unknown]</pre>  | <pre>(12112 bits), 1514 b<br/>1:a6 (00:30:67:06:14<br/>1: 130.215.16.215 (1<br/>1: 0x00 (DSCP 0x00: 1<br/>1)<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>1<br/>1<br/>1<br/>1<br/>1<br/>1<br/>1<br/>1</pre>   | oytes capture<br>4:a6), Dst: I<br>L30.215.16.21  | ed (12112 bits) on<br>ETF-VRRP-VRID_01<br>5), Dst: 128.125.   | interfac<br>(00:00:5e<br>253.146 ( | :00:01:01<br>128.125.2 | 53.146)   |           |
| <pre>Frame 2549: 1514 bytes on wire (<br/>Ethernet II, Src: BiostarM_06:14<br/>Internet Protocol Version 4, Src<br/>Version: 4<br/>Header length: 20 bytes<br/>Differentiated Services Field:<br/>Total Length: 1500<br/>Identification: 0x412d (16685)<br/>Flags: 0x01 (More Fragments)<br/>0 = Reserved bit: No<br/>.0 = Don't fragments:<br/>Fragment offset: 0<br/>Time to live: 1<br/>Protocol: ICMP (1)<br/>Header checksum: 0x0000 [valid<br/>Source: 130.215.16.215 (130.21<br/>Destination: 128.125.253.146 (<br/>[Source GeoIP: Unknown]<br/>[Destination GeoIP: Unknown]</pre>   | <pre>(12112 bits), 1514 b<br/>1:a6 (00:30:67:06:14<br/>1: 130.215.16.215 (1<br/>1: 0x00 (DSCP 0x00: 1<br/>1)<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>1<br/>1<br/>1<br/>1<br/>1<br/>1<br/>1<br/>1</pre>   | oytes capture<br>4:a6), Dst: I<br>L30.215.16.21  | ed (12112 bits) on<br>ETF-VRRP-VRID_01<br>5), Dst: 128.125.   | interfac<br>(00:00:5e<br>253.146 ( | :00:01:01<br>128.125.2 | 53.146)   |           |
| <pre>Frame 2549: 1514 bytes on wire (<br/>Ethernet II, Src: BiostarM_06:14<br/>Internet Protocol Version 4, Src<br/>Version: 4<br/>Header length: 20 bytes<br/>Differentiated Services Field:<br/>Total Length: 1500<br/>Identification: 0x412d (16685)<br/>Flags: 0x01 (More Fragments)<br/>0 = Reserved bit: No<br/>.0 = Don't fragments:<br/>.1 = More fragments:<br/>Fragment offset: 0<br/>Time to live: 1<br/>Protocol: ICMP (1)<br/>Header checksum: 0x0000 [valid<br/>Source: 130.215.16.215 (130.21<br/>Destination: 128.125.253.146 (<br/>[Source GeoIP: Unknown]<br/>[Destination GeoIP: Unknown]</pre>  | <pre>(12112 bits), 1514 b<br/>1:a6 (00:30:67:06:14<br/>1: 130.215.16.215 (1<br/>1: 0x00 (DSCP 0x00: 1<br/>1)<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>1<br/>1<br/>1<br/>1<br/>1<br/>1<br/>1<br/>1</pre>   | oytes capture<br>4:a6), Dst: I<br>L30.215.16.21  | ed (12112 bits) on<br>ETF-VRRP-VRID_01<br>5), Dst: 128.125.   | interfac<br>(00:00:5e<br>253.146 ( | :00:01:01<br>128.125.2 | 53.146)   |           |
| <pre>Frame 2549: 1514 bytes on wire (<br/>Ethernet II, Src: BiostarM_06:14<br/>Internet Protocol Version 4, Src<br/>Version: 4<br/>Header length: 20 bytes<br/>Differentiated Services Field:<br/>Total Length: 1500<br/>Identification: 0x412d (16685)<br/>Flags: 0x01 (More Fragments)<br/>0 = Reserved bit: No<br/>.0 = Don't fragments:<br/>.1 = More fragments:<br/>Fragment offset: 0<br/>Time to live: 1<br/>Protocol: ICMP (1)<br/>Header checksum: 0x0000 [valid<br/>Source: 130.215.16.215 (130.21<br/>Destination: 128.125.253.146 (<br/>[Source GeoIP: Unknown]<br/>[Destination GeoIP: Unknown]</pre>  | <pre>(12112 bits), 1514 b<br/>1:a6 (00:30:67:06:14<br/>1: 130.215.16.215 (1<br/>1: 0x00 (DSCP 0x00: 1<br/>1)<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>1<br/>1<br/>1<br/>1<br/>1<br/>1<br/>1<br/>1</pre>   | oytes capture<br>4:a6), Dst: I<br>L30.215.16.21  | ed (12112 bits) on<br>ETF-VRRP-VRID_01<br>5), Dst: 128.125.   | interfac<br>(00:00:5e<br>253.146 ( | :00:01:01<br>128.125.2 | 53.146)   |           |
| <pre>Frame 2549: 1514 bytes on wire (<br/>Ethernet II, Src: BiostarM_06:14<br/>Internet Protocol Version 4, Src<br/>Version: 4<br/>Header length: 20 bytes<br/>Differentiated Services Field:<br/>Total Length: 1500<br/>Identification: 0x412d (16685)<br/>Flags: 0x01 (More Fragments)<br/>0 = Reserved bit: No<br/>.0 = Don't fragments:<br/>.1 = More fragments:<br/>Fragment offset: 0<br/>Time to live: 1<br/>Protocol: ICMP (1)<br/>Header checksum: 0x0000 [valid<br/>Source: 130.215.16.215 (130.21<br/>Destination: 128.125.253.146 (<br/>[Source GeoIP: Unknown]</pre>   | <pre>(12112 bits), 1514 b<br/>1:a6 (00:30:67:06:14<br/>1: 130.215.16.215 (1<br/>1: 0x00 (DSCP 0x00: 1<br/>1)<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>0<br/>1<br/>1<br/>1<br/>1<br/>1<br/>1<br/>1<br/>1</pre>   | oytes capture<br>4:a6), Dst: I<br>L30.215.16.21  | ed (12112 bits) on<br>ETF-VRRP-VRID_01<br>5), Dst: 128.125.   | interfac<br>(00:00:5e<br>253.146 ( | :00:01:01<br>128.125.2 | 53.146)   |           |
| Frame 2549: 1514 bytes on wire (<br>Ethernet II, Src: BiostarM_06:14<br>Internet Protocol Version 4, Src<br>Version: 4<br>Header length: 20 bytes<br>Differentiated Services Field:<br>Total Length: 1500<br>Identification: 0x412d (16685)<br>Flags: 0x01 (More Fragments)<br>0 = Reserved bit: Not<br>.0 = More fragments:<br>Fragment offset: 0<br>Time to live: 1<br>Protocol: ICMP (1)<br>Header checksum: 0x0000 [valid<br>Source: 130.215.16.215 (130.21<br>Destination: 128.125.253.146 (<br>[Source GeoIP: Unknown]<br>[Destination GeoIP: Unknown]<br>Internet Control Message Protocol<br>000 00 00 5e 00 01 01 00 30 67   | <pre>(12112 bits), 1514 b<br/>1:a6 (00:30:67:06:14<br/>1: 130.215.16.215 (1<br/>1: 0x00 (DSCP 0x00: n<br/>1: 0x00 (DSCP 0x00: n<br/>1: 0x00 set<br/>Not set<br/>Set<br/>dation disabled]<br/>1:5.16.215)<br/>(128.125.253.146)<br/>01<br/>06 14 a6 08 00 45 0</pre>  | <pre>pytes capture<br/>#:a6), Dst: I<br/>130.215.16.21<br/>Default; ECN:<br/>00^0</pre>  | ed (12112 bits) on<br>ETF-VRRP-VRID_01<br>(5), DST: 128.125.<br>0x00: Not-ECT (N<br>0x00: Not-ECT (N  | interfac<br>(00:00:5e<br>253.146 ( | :00:01:01<br>128.125.2 | 53.146)   |           |
| <pre>Frame 2549: 1514 bytes on wire (<br/>Ethernet II, Src: BiostarM_06:14<br/>Internet Protocol Version 4, Src<br/>Version: 4<br/>Header length: 20 bytes<br/>Differentiated Services Field:<br/>Total Length: 1500<br/>Identification: 0x412d (16685)<br/>Flags: 0x01 (More Fragments)<br/>0 = Reserved bit: NG<br/>.0 = Don't fragment:<br/>.1 = More fragments:<br/>Fragment offset: 0<br/>Time to live: 1<br/>Protocol: ICMP (1)<br/>Header checksum: 0x0000 [valid<br/>Source: 130.215.16.215 (130.21<br/>Destination: 128.125.253.146 (<br/>[Source GeoIP: Unknown]<br/>[Destination GeoIP: Unknown]<br/>Internet Control Message Protoco<br/>000 00 00 5 dc 41 2d 20 00 01 01 00<br/>020 fd 92 08 00 07 c9 00 01 00</pre>   | (12112 bits), 1514 b<br>1:a6 (00:30:67:06:14<br>1:a6 (00:30:67:06:14<br>1:a6 (00:30:67:06:14<br>1:a6 (00:00:07)<br>1:a6 (00:00:16<br>1:a6 (0500 00:16<br>1:a6 (0500 00)<br>1:a6 (00)<br>1:a6 (0 | Dytes capture<br>1:a6), Dst: I<br>130.215.16.21<br>Default; ECN:<br>00^0<br>200  | d (12112 bits) on<br>ETF-VRRP-VRID_01<br>5), Dst: 128.125.<br>0x00: Not-ECT (N<br>0x00: Not-ECT (N<br>}<br>}  | interfac<br>(00:00:5e<br>253.146 ( | :00:01:01<br>128.125.2 | 53.146)   |           |
| Frame 2549: 1514 bytes on wire (<br>Ethernet II, Src: BiostarM_06:14<br>Internet Protocol Version 4, Src<br>Version: 4<br>Header length: 20 bytes<br>Differentiated Services Field:<br>Total Length: 1500<br>Identification: 0x412d (16685)<br>Flags: 0x01 (More Fragments)<br>0 = Reserved bit: NC<br>.0 = Don't fragments:<br>.1 = More fragments:<br>Fragment offset: 0<br>Time to live: 1<br>Protocol: ICMP (1)<br>Header checksum: 0x0000 [valid<br>Source: 130.215.16.215 (130.21<br>Destination: 128.125.253.146 (<br>[Source GeoIP: Unknown]<br>[Destination GeoIP: Unknown]<br>Internet Control Message Protoco<br>000 00 00 05 dc 41 2d 20 00 01 01 00<br>020 fd 92 08 00 07 c9 00 01 00<br>030 50 6c 6f 74 74 65 72 53 74<br>040 2e 34 32 2e 32 73 36 45 50  | (12112 bits), 1514 b<br>1:a6 (00:30:67:06:14<br>1:a6 (00:30:67:06:14<br>1:a6 (00:30:67:06:14<br>1:a6 (00:30:67:06:14<br>1:a6 (00:00)<br>1:a6   | Dytes capture<br>1:a6), Dst: I<br>1:30.215.16.21<br>Default; ECN:<br>Default; ECN:<br>00^0<br>010<br>020<br>03 PlotterS<br>4. 42.256E  | d (12112 bits) on<br>ETF-VRRP-VRID_01<br>5), Dst: 128.125.<br>0x00: Not-ECT (N<br>0x00: Not-ECT (N<br>9   | interfac<br>(00:00:5e<br>253.146 ( | :00:01:01<br>128.125.2 | 53.146)   |           |
| Frame 2549: 1514 bytes on wire (<br>Ethernet II, Src: BiostarM_06:14<br>Internet Protocol Version 4, Src<br>Version: 4<br>Header length: 20 bytes<br>Differentiated Services Field:<br>Total Length: 1500<br>Identification: 0x412d (16685)<br>Flags: 0x01 (More Fragments)<br>0 = Reserved bit: No<br>.0 = Don't fragment:<br>.1 = More fragments:<br>Fragment offset: 0<br>Time to live: 1<br>Protocol: ICMP (1)<br>Header checksum: 0x0000 [valid<br>Source: 130.215.16.215 (130.21<br>Destination GeoIP: Unknown]<br>[Destination GeoIP: Unknown]<br>Internet Control Message Protoco<br>100 05 dc 41 2d 20 00 01 01 00<br>20 08 00 07 c9 00 01 00<br>20 34 32 2e 32 73 36 45 50<br>50 74 65 72 53 74 61 66 e6 46 61<br>50 27 3 36 45 50 69 66 67 50  | (12112 bits), 1514 b<br>1:a6 (00:30:67:06:14<br>1:a6 (00:30:67:06:14<br>1:a6 (00:30:67:06:14<br>1:a6 (00:30:67:06:14<br>1:a6 (00:30:67:06:14<br>1:a6 (00:30:67:00:16<br>1:a6 (00:30:67:14)<br>1:a6 (00:30:67:14)<br>1:a6 (00:30:16)<br>1:a6 (00:30:16)  | Dytes capture<br>1:a6), Dst: I<br>1:30.215.16.21<br>Default; ECN:<br>Default; ECN:<br>00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1: | d (12112 bits) on<br>ETF-VRRP-VRID_01<br>5), Dst: 128.125.<br>0x00: Not-ECT (N<br>0x00: not-ECT (N<br>0x00  | interfac<br>(00:00:5e<br>253.146 ( | :00:01:01<br>128.125.2 | 53.146)   |           |
| <pre>Frame 2549: 1514 bytes on wire (<br/>Ethernet II, Src: BiostarM_06:14<br/>Internet Protocol Version 4, Src<br/>Version: 4<br/>Header length: 20 bytes<br/>Differentiated Services Field:<br/>Total Length: 1500<br/>Identification: 0x412d (16685)<br/>Flags: 0x01 (More Fragments)<br/>0 = Reserved bit: NG<br/>.0 = Don't fragment:<br/>.1 = More fragments:<br/>Fragment offset: 0<br/>Time to live: 1<br/>Protocol: ICMP (1)<br/>Header checksum: 0x0000 [valid<br/>Source: 130.215.16.215 (130.21<br/>Destination: 128.125.253.146 (<br/>[Source GeoIP: Unknown]<br/>[Destination GeoIP: Unknown]<br/>Internet Control Message Protoco<br/>000 00 00 5e 00 01 01 00 30 67<br/>010 05 dc 41 2d 20 00 01 01 00<br/>020 fd 92 08 00 07 c9 00 01 00<br/>030 50 6c 6f 74 74 65 72 53 74<br/>04 22 32 73 36 45 50<br/>050 74 65 72 53 74 61 6e 64 61<br/>060 32 73 36 45 10 69 66 75 50<br/>70 74 61 6e 64 61 72 64 33 2e</pre> | (12112 bits), 1514 b<br>1:a6 (00:30:67:06:14<br>1:a6 (00:30:67:06:14<br>1:a6 (00:30:67:06:14<br>1:a6 (00:00:00:00:10<br>1:a6 (00:00:00:00:10<br>1:a6 (00:00:00:00:00:00<br>1:a6 (00:00:00:00:00:00<br>1:a6 (00:00:00:00:00:00:00<br>1:a6 (00:00:00:00:00:00:00:00:00<br>0:a6 (00:00:00:00:00:00:00:00:00:00:00:00:00:  | Dytes capture<br>1:a6), Dst: I<br>1:30.215.16.21<br>Default; ECN:<br>Default; ECN:<br>00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1:00<br>1: | d (12112 bits) on<br>ETF-VRRP-VRID_01<br>(5), DST: 128.125.<br>0x00: NOT-ECT (N<br>0x00: N<br>0x00: NOT-ECT (N<br>0x00: N<br>0x00: N<br>0x0 | interfac<br>(00:00:5e<br>253.146 ( | :00:01:01<br>128.125.2 | 53.146)   |           |

12. Print out the second fragment of the fragmented IP datagram. What information in the IP header indicates that this is not the first datagram fragment? Are there more fragments? How can you tell?

See screenshot below. The "Fragment offset" is 1480, indicating this is the second fragment. The "more fragments" bit is clear, indicating this is the last fragment.

| 1 *Lo   | cal Are  | ea Co   | nneo  | tion   | [Wi  | resha  | k 1.10   | .6 (v1.1   | .0.6 fi  | rom ma  | aster-1  | .10)]                                  |  |  |   |  |                         |                        |                        |                     |              |                |                |      |       |       | X  |
|---|--|---|---|--|--|--|--|--|--|---|--|--|--|--|---|--|-------------------------|------------------------|------------------------|---------------------|--------------|----------------|----------------|------|-------|-------|----|
| <u>F</u> ile (  | <u>E</u> dit   | <u>V</u> iew  | / <u>G</u>  | o <u>c</u>   | aptu   | re A   | nalyze   | <u>S</u> tati:   | stics  | Telep   | hony   | <u>T</u> ools                          | Inter                                  | nals <u>H</u> el   | p   |  |                         |                        |                        |                     |              |                |                |      |       |       |    |
| 0 0   |  |   |   |  |  | 010  | X 2  | )   Q  | 、 🖨  | •   | <del>ا</del>   | F 1                                    |  |  | QQ  | 0  | ]   🎽                   | ( ¥                    | <b>1</b>               | 6                   | Ø            |                |                |      |       |       |    |
| Filter:   | ip.ac  | ldr =:  | = 130   | ).215  | .16.21   | .5   |  |  |  |   |  |  | ▼ E                                    | Expression   | Clea  | r Appl   | ly Sav                  | 'e                     |                        |                     |              |                |                |      |       |       |    |
| o.  |  | me  |   |  | Sourc  |  |  |  |  | estinat   |  |  |  | Protocol   |   |  |                         |                        |                        |                     |              |                |                |      | - /   |       |    |
|   |  |   |   |  |  |  | 16.2   |  |  |   |  | 53.140<br>53.140                       |  | ICMP<br>IPV4   |   |  |                         |                        |                        |                     |              | x0001<br>roto= |                |      |       |       |    |
|   |  |   |   |  |  |  | 16.2   |  |  |   |  | 6.215<br>53.140                        |  | ICMP<br>ICMP   |   |  |                         |                        |                        |                     |              | me to          |                |      |       |       | _  |
|   |  |   |   |  |  |  | 16.2   |  |  |   |  | 53.140                                 |  | IPV4   |   |  |                         |                        |                        |                     |              | x0001<br>roto= | -              |      |       |       |    |
|   |  |   |   |  |  |  | 0.74   |  |  |   |  | 6.215<br>53.140                        |  | ICMP<br>ICMP   |   |  |                         |                        |                        |                     |              | me to<br>x0001 |                |      |       |       |    |
|   |  |   |   |  |  |  | 16.2   |  |  |   |  | 53.140                                 |  | IPV4   | 534   | 4 Frag   | gment                   | ed II                  | prot                   | toco                | 1 (p         | roto=          | ICMP           | 1, 0 | off=1 | 480,  | ID |
|   |  |   |   |  |  |  | 7.17   |  |  |   |  | 6.215<br>53.140                        |  | ICMP<br>ICMP   |   |  |                         |                        |                        |                     |              | me to<br>x0001 |                |      |       |       |    |
| 25  | 85 3   | 5.42  | 2309  | 980 :  | 130.   | 215  | 16.2   | 15   | 1  | 128.1   | 25.2   | 53.140                                 | 5                                      | IPv4   | 534   | 4 Frag   | gment                   | ed II                  | o prot                 | toco                | 1 (p         | roto=          | ICMP           | 1,   | off=1 | 480,  | ID |
|   |  |   |   |  |  |  | 9.241  |  |  |   |  | 6.215<br>53.140                        |  | ICMP<br>ICMP   |   |  |                         |                        |                        |                     |              | me to<br>x0001 |                |      |       |       |    |
| 25  | 893  | 5.40  | 5312  | 230 :  | 130.   | 215  | 16.2   | 15   |  |   |  | 53.146                                 |  | IPv4   | 534   | 4 Frag   | gment                   | ed II                  | p prot                 | toco                | 1 (p         | roto=          | ICMP           | 1, ( | off=1 | 480,  | IC |
|   |  |   |   |  |  |  | 9.222  |  |  |   |  | 6.215<br>53.140                        | 5                                      | ICMP<br>ICMP   |   |  |                         |                        |                        |                     |              | me to<br>x0001 |                |      |       |       |    |
| 25  | 92 3   | 5.50  | 0320  | 050  | 130.   | 215  | 16.2   |  | 1  | L28.1   | 25.2   | 53.146                                 | 5                                      | IPv4   | 534   | 4 Frag   | gment                   | ed II                  | prot                   | toco                | 1 (p         | roto=          | ICMP           | 1, ( | off=1 | 480,  | IC |
|   |  |   |   |  |  |  | 45.1<br>16.2   | 15   |  |   |  | 6.215<br>53.140                        |  | ICMP<br>ICMP   |   |  |                         |                        |                        |                     |              | me to<br>x0001 |                |      |       |       |    |
| 26  | 07 3   | 5.54  | 4322  | 210  | 130.   | 215  | 16.2   |  |  |   |  | 53.146                                 |  | IPv4   | 534   | 4 Frag   | gment                   | ed I                   | prot                   | toco                | 1 (p         | roto=          | ICMP           | 1, ( | off=1 | 480,  | IC |
| Fra<br>Eth<br>Int<br>V<br>H<br>E D  | ame i<br>nern<br>(ern<br>/ers<br>Head<br>Diff<br>Tota  | 2550<br>et J<br>et F<br>ion:<br>er l<br>erer<br>l Le  | ): 5<br>II,<br>Prot<br>: 4<br>leng<br>ntia<br>engt  | 534<br>Src<br>oco<br>gth:<br>ated  | byt<br>: B<br>20<br>520  | es o<br>iost<br>ersi<br>byt<br>rvic  | arM_(<br>on 4<br>es<br>es F  | re (4<br>06:14<br>, src<br>ield:   | 272<br>:a6<br>: 1:<br>0x(  | bits<br>(00:<br>30.21   | 30:6<br>5.16   | 34 byt<br>7:06:1<br>.215               | tes c<br>L4:a6<br>(130.                | ICMP<br>captured<br>), Dst:<br>215.16.                                   | d (427<br>: IETF<br>. 215),   | 2 bit<br>-VRRP<br>Dst:   | :s) or<br>P-VRII<br>128 | n int<br>D_01<br>.125. | erfa<br>(00:0<br>253.1 | ce 0<br>00:5<br>L46 | e:00<br>(128 | :01:0<br>.125. | <br>1)<br>253. | 146) |       | 7     |    |
| Fra<br>Eth<br>Int<br>W<br>H<br>E<br>E<br>F  | ame<br>lern<br>/ers<br>lead<br>Diff<br>Tota<br>Iden<br>1ag<br>0.   | 2550<br>et J<br>et F<br>erer<br>l Le<br>tifi<br>s: 0  | Prot<br>rot<br>deng<br>ntia<br>ngt<br>icat<br>0x00  | 34<br>5rc<br>coco<br>gth:<br>ated<br>th:<br>ion<br>=<br>=<br>=   | byt<br>B<br>20<br>520<br>520<br>C<br>Res<br>Don<br>Mor   | es o<br>iost<br>ersi<br>byt<br>rvic<br>x412<br>erve<br>'t f<br>e fr  | n wi<br>arM_<br>on 4<br>es F<br>d (1<br>d bi<br>ragm<br>agme   | re (4<br>06:14<br>, src  | 272<br>:a6<br>: 1<br>0x(<br>t se   | bits<br>(00:<br>30.21<br>00 (C  | 30:6<br>5.16   | 34 byt<br>7:06:1<br>.215               | tes c<br>L4:a6<br>(130.                | apturec<br>), Dst<br>215.16.   | d (427<br>: IETF<br>. 215),   | 2 bit<br>-VRRP<br>Dst:   | :s) or<br>P-VRII<br>128 | n int<br>D_01<br>.125. | erfa<br>(00:0<br>253.1 | ce 0<br>00:5<br>L46 | e:00<br>(128 | :01:0<br>.125. | <br>1)<br>253. | 146) |       | 7     |    |
| Fra<br>Eth<br>Int<br>H C<br>T<br>F<br>F   | ame :<br>hern<br>/ers<br>leado<br>Diff<br>Tota<br>tden<br>lag:<br>0.<br>.0<br>.0   | 2550<br>et ]<br>et F<br>ion:<br>er ]<br>er er<br>l Le<br>tifi<br>s: ()<br><br>0<br>ment   | ): 5<br>II,<br>Prot<br>: 4<br>lengt<br>icat<br>)x00<br><br>c of<br>liv  | 34<br>Src<br>oco<br>gth:<br>ated<br>th:<br>ion<br>=<br>=<br>=<br>fse   | byt<br>B<br>20<br>Sei<br>520<br>C<br>Res<br>Don<br>Mor<br>et:<br>1   | es o<br>iost<br>ersi<br>rvic<br>x412<br>erve<br>'t f<br>e fr<br>1480   | n wi<br>arM_<br>on 4<br>es F<br>d (1<br>d bi<br>ragm<br>agme   | re (4<br>D6:14<br>, Src<br>ield:<br>6685)<br>t: No<br>ent:   | 272<br>:a6<br>: 1<br>0x(<br>t se   | bits<br>(00:<br>30.21<br>00 (C  | 30:6<br>5.16   | 34 byt<br>7:06:1<br>.215               | tes c<br>L4:a6<br>(130.                | apturec<br>), Dst<br>215.16.   | d (427<br>: IETF<br>. 215),   | 2 bit<br>-VRRP<br>Dst:   | :s) or<br>P-VRII<br>128 | n int<br>D_01<br>.125. | erfa<br>(00:0<br>253.1 | ce 0<br>00:5<br>L46 | e:00<br>(128 | :01:0<br>.125. | <br>1)<br>253. | 146) |       | 7 *** |    |
| Prrat<br>Fra<br>Eth<br>Int<br>V<br>H<br>C<br>F<br>F<br>F<br>F<br>F<br>F<br>F<br>C<br>C<br>C<br>C<br>C<br>C<br>C<br>C<br>C<br>C<br>C<br>C<br>C | ame<br>arr n<br>arr n<br>ar | 2550<br>et J<br>et F<br>er r<br>l Le<br>tifi<br>s: (<br><br>0<br>ment<br>to<br>ocol<br>er (<br>ce:<br>inat<br>rce   | ): 5<br>II,<br>Prot<br>: 4<br>leng<br>ticat<br>)x00<br><br>cof<br>lix<br>l: 1<br>chec<br>130<br>cior<br>Geo<br>atic | 34<br>Src<br>oco<br>gth:<br>ated<br>th:<br>cion<br>=<br>=<br>fse<br>/e:<br>CCMP<br>tksu<br>).21<br>1: 1<br>DIP:<br>DDP:<br>Gon G                             | byt:<br>B<br>20<br>520<br>520<br>1 520<br>1 520<br>0<br>Ress<br>Don<br>Mor<br>1<br>1<br>1<br>28.3<br>Un<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>SeoI<br>Seo | es o<br>iost<br>byt<br>rvic<br>x412<br>erve<br>erve<br>fr<br>1480<br>)<br>0x00<br>6.21<br>125.<br>know   | n wi<br>arM_<br>on 4<br>es<br>es F<br>d (1<br>d bi<br>ragme<br>agme<br>00 [<br>5 (1<br>253.:   | re (4<br>06:14<br>, Src<br>ield:<br>5685)<br>t: No<br>ent:<br>nts:<br>valid<br>30.21<br>146 (  | 272<br>:a6<br>: 1:<br>0x(<br>t s(<br>Not<br>Not  | bits<br>(00:<br>30.21<br>00 (C<br>et<br>set<br>set<br>set<br>5.215        | sable  | 34 byt<br>7:06:1<br>.215<br>0x00:      | tes c<br>L4:a6<br>(130.                | apturec<br>), Dst<br>215.16.   | d (427<br>: IETF<br>. 215),   | 2 bit<br>-VRRP<br>Dst:   | :s) or<br>P-VRII<br>128 | n int<br>D_01<br>.125. | erfa<br>(00:0<br>253.1 | ce 0<br>00:5<br>L46 | e:00<br>(128 | :01:0<br>.125. | <br>1)<br>253. | 146) |       | 7     |    |
| Fra<br>Eth<br>Int<br>↓<br>↓<br>↓<br>↓<br>↓<br>↓<br>↓<br>↓<br>↓<br>↓<br>↓<br>↓<br>↓<br>↓<br>↓<br>↓<br>↓<br>↓<br>↓                              | ame inerna<br>versiead<br>offfota<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identification<br>identifi  | 2550<br>et ]<br>et F<br>ion:<br>er er<br>l Le<br>tifi<br>s: (<br><br>ment<br>to<br>occol<br>er c<br>cce:<br>inat<br>tinat<br>500  | 55e 41<br>55e 41<br>55e 41<br>55e 41<br>55e 41<br>55e 41<br>55e 41<br>66e 66  | 334<br>Src<br>000<br>gth:<br>ion<br>=<br>=<br>fse<br>(c:<br>CCMP<br>ksu<br>).21<br>i:<br>1:<br>1:<br>0:<br>0:<br>0:<br>0:<br>0:<br>0:<br>0:<br>0:<br>0:<br>0 | byt<br>: B<br>20<br>See<br>520<br>01<br>02<br>Res<br>520<br>01<br>01<br>01<br>01<br>01<br>01<br>01<br>01<br>01<br>0  | es o<br>iost<br>ersi<br>byttrvic<br>x412<br>erve<br>'t f<br>e fr<br>1480<br>)<br>0x000<br>6.21<br>125.<br>know<br>P: U<br>01 0<br>09 0<br>072 6<br>66 6                                    | n wi<br>arM<br>on 4<br>es F<br>d (1<br>d bi<br>ragme<br>00 [<br>5 (1<br>5 (2<br>5 (3)<br>7<br>n]<br>nknov<br>0 300<br>1 01<br>1 4 33<br>f 74   | re (4<br>06:14<br>, Src<br>6685)<br>t: No<br>ent:<br>nts:<br>valid<br>30.21<br>146 (<br>wwn]<br>67<br>00<br>2e<br>74                     | 272<br>:a6<br>: 1:<br>0x(<br>Not<br>Not<br>128.<br>006 1<br>006 1<br>006 5                     | bits:<br>(00: 30.21<br>000 (C<br>et<br>set<br>set<br>125.<br>125.         | ), 5:<br>30:60<br>5:16<br>0SCP (<br>)<br>253.<br>(<br>08 (<br>10 (<br>10 (<br>32 )<br>74 ( | ed]<br>146)<br>00 45<br>d7 80<br>73 36 | 00<br>00<br>7d<br>45<br>64             | ^<br>aptured<br>), DSt:<br>215.16.<br>uult; EC<br><br><br><br><br>PingPi | .0 g.   | E  |                         | n int<br>D_01<br>.125. | erfa<br>(00:0<br>253.1 | ce 0<br>00:5<br>L46 | e:00<br>(128 | :01:0<br>.125. | <br>1)<br>253. | 146) |       | 7     |    |
| Fra<br>Eth<br>Int<br>↓<br>↓<br>↓<br>↓<br>↓<br>↓<br>↓<br>↓<br>↓<br>↓<br>↓<br>↓<br>↓<br>↓<br>↓<br>↓<br>↓<br>↓<br>↓                              | ame inerna<br>inerna<br>(ersidead<br>offf<br>Tota<br>Cota<br>Cota<br>Cota<br>Cota<br>Cota<br>Cota<br>Cota<br>C   | 2550<br>et J<br>et F<br>er l<br>er er<br>l Le<br>tifi<br>s: (<br><br>00<br>ment<br>to<br>ocol<br>er c<br>ce:<br>tinat<br>to<br>00<br>00<br>92<br>69<br>262<br>34<br>500 | 5 e 6 e 6 e 6 e 6 e 6 e 7 7 2   | 34<br>Src<br>oco<br>gth:<br>ated<br>h:<br>ion<br>=<br>=<br>=<br>=<br>=<br>=<br>=<br>=<br>=<br>=<br>=<br>=<br>=   | byt<br>: B<br>20<br>20<br>520<br>: 0<br>Res<br>Don<br>Mor<br>t:<br>0<br>(1<br>m:<br>5.1  | es o<br>iost<br>ersi<br>byttrvic<br>x412<br>erve<br>'t f<br>e fr<br>1480<br>0.000<br>6.21<br>0.000<br>6.21<br>know<br>P: U<br>01 0<br>0<br>b9 0<br>072 6<br>65 6<br>334 3<br>365 7<br>73 3 | n wii<br>arM<br>on 4<br>es F<br>d (1)<br>d bir<br>ragme<br>00 [1<br>5 (1)<br>7 (3)<br>7 (3)<br>7 (4)<br>7 (3)<br>7 (4)<br>7 (3)<br>7 (4)<br>7 | re (4<br>06:14<br>, Src<br>ield:<br>6685)<br>t: No<br>ent:<br>nts:<br>valid<br>30.21<br>146 (<br>wn]<br>67<br>00<br>2e<br>74<br>50<br>61 | 272<br>272<br>272<br>272<br>272<br>202<br>0x(<br>0x(<br>0x(<br>0x(<br>0x(<br>0x(<br>0x(<br>0x( | bits<br>(00: 30.21<br>30.21<br>000 (C<br>et<br>set<br>set<br>125.<br>125. | ), 5<br>30:60<br>5.16<br>08CP (<br>08CP (<br>10<br>253.:<br>253.:<br>253.:                 | ed]<br>146)<br>00 45<br>d7 80<br>73 36 | 00<br>7d<br>7d<br>7d<br>7d<br>7d<br>7d |  | .0 g.<br>.1215),<br>cN: 0x<br>d3 .4<br>lot te<br>lot te<br>set ta<br>set pi<br>and an | 2 bit<br>-VRRP<br>DSt:<br>000: N<br>2.256<br>cPin<br>ndard<br>ngPl0<br>d3.42 | - /<br>                 | n int<br>D_01<br>.125. | erfa<br>(00:0<br>253.1 | ce 0<br>00:5<br>L46 | e:00<br>(128 | :01:0<br>.125. | <br>1)<br>253. | 146) |       |       |    |

- 13. What fields change in the IP header between the first and second fragment? Total length, the more fragments bit, fragment offset. Note that identification and time to live don't change.
- 14. Now find the first ICMP Echo Request message that was sent by your computer after you changed the Packet Size in pingplotter to be 3500. How many fragments were created from the original datagram? What fields change in the IP header among the fragments?

See screenshot below. Three fragments were created from the original datagram in this case. The fields that change are:

- Between fragments 1 and 2: fragment offset changes
- Between fragments 2 and 3: total length, the more fragments bit, fragment offset.

| *Local Area Connection [Wireshark 1.10.6 (v1.10)   | ).6 from master-1.10)]  |   |  |                                     |  |
|--|---|---|--|-------------------------------------|--|
| File Edit View Go Capture Analyze Statist  |   | Internals Help  |  | _                                   |  |
| ● ● ◢ ■ ◢ ⊨ ⊑ ₩ ₴ ! ٩  |   |   | 0,0,11                                   | R 🕺 🕅                               |  |
| Filter: ip.addr == 130.215.16.215  |   | <ul> <li>Expression</li> </ul>  | Clear Apply Save                         |                                     |  |
| No. Time Source  | Destination   | Protocol L  | ength Info                               |                                     | *  |
| 2659 35.8244370 130.215.16.215   | 128.125.253.146   | ICMP  | 1514 Echo (ping) r                       | equest id=0x000                     | 1, seq=268/3073, ttl=                            |
| 2660 35.8244450 130.215.16.215   | 128.125.253.146   | IPv4  |  |                                     | =ICMP 1, off=1480, ID                            |
| 2665 35.8313130 128.125.253.146<br>2667 35.8703290 128.125.253.146   | 130.215.16.215<br>130.215.16.215  | ICMP<br>ICMP  | 1514 Echo (ping) r<br>1514 Echo (ping) r |                                     | 1, seq=266/2561, ttl=<br>1, seq=267/2817, ttl=   |
| 2669 35.9113520 128.125.253.146  | 130.215.16.215  | ICMP  | 1514 Echo (ping) r                       |                                     | 1, seq=268/3073, ttl=                            |
| 3101 41.3170240 130.215.16.215   | 224.0.0.22  | IGMPv3  |  |                                     | p 224.0.0.252 for any                            |
| 3152 42.3169030 130.215.16.215<br>3163 42.4526380 130.215.129.142  | 224.0.0.22<br>130.215.16.215  | IGMPV3<br>TCP   |  | port / Join grou<br>[SYN] Seq=0 Win | p 224.0.0.252 for any                            |
| 3302 45.2567020 130.215.129.142  | 130.215.16.215  | TCP   |  | [SYN] Seq=0 Win                     |  |
| 3321 45.7895980 130.215.129.142  | 130.215.16.215  | тср   | 60 43594 > 27046                         | [SYN] Seq=0 Win                     | =1024 Len=0                                      |
| 3411 47.7005830 130.215.129.142  | 130.215.16.215  | TCP   |  | [SYN] Seq=0 Win                     |  |
| 3567 51.6941700 130.215.16.215<br>3568 51.6941810 130.215.16.215   | 128.125.253.146<br>128.125.253.146  | ICMP<br>IPV4  |  |                                     | 1, seq=269/3329, ttl=<br>=ICMP 1, off=1480, ID = |
| 3569 51.6941840 130.215.16.215   | 128.125.253.146   | IPV4  |  |                                     | =ICMP 1, off=2960, ID                            |
| 3570 51.6945940 130.215.16.2   | 130.215.16.215  | ICMP  |  |                                     | o live exceeded in tr                            |
| 3577 51.7341760130.215.16.215<br>3578 51.7341940130.215.16.215   | 128.125.253.146<br>128.125.253.146  | ICMP<br>IPV4  |  |                                     | 1, seq=270/3585, ttl=<br>=ICMP 1, off=1480, ID   |
| 3579 51.7341970 130.215.16.215   | 128.125.253.146   | IPv4  |  |                                     | =ICMP 1, off=2960, ID                            |
| 3580 51.7394100 130.215.0.74   | 130.215.16.215  | ICMP  |  |                                     | o live exceeded in tr                            |
| 3583 51.7751850 130.215.16.215<br>3584 51.7752060 130.215.16.215   | 128.125.253.146<br>128.125.253.146  | ICMP<br>IPV4  |  |                                     | 1, seq=271/3841, ttl=<br>=ICMP 1, off=1480, ID - |
| <pre>Ethernet II, Src: BiostarM_06:14:<br/>Internet Protocol Version 4, Src:<br/>Version: 4<br/>Header length: 20 bytes<br/>Differentiated Services Field:<br/>Total Length: 1500<br/>Identification: 0x413d (16701)<br/>Flags: 0x01 (More Fragments)<br/>0 = Reserved bit: Not<br/>.0 = Don't fragment: N<br/>.1 = More fragments: S<br/>Fragment offset: 0<br/>Time to live: 1<br/>Protocol: ICMP (1)<br/>Header checksum: 0x0000 [valida<br/>Source: 130.215.16.215 (130.215<br/>Destination: 128.125.253.146 (1<br/>[Source GeoIP: Unknown]<br/>[Destination GeoIP: Unknown]</pre>   | 130.215.16.215 (1<br>0x00 (DSCP 0x00: C<br>set<br>ot set<br>et<br>tion disabled]<br>.16.215)<br>28.125.253.146) | 30.215.16.2   | 215), Dst: 128.125.                      | 253.146 (128.125                    | .253.146)  |
| 0010         05         dc         41         3d         20         00         01         01         00         0           0020         fd         92         08         00         66         48         00         01         01         0           0030         50         6c         6f         74         74         65         72         53         74         6           0040         2e         34         32         2e         32         73         39         45         50         6           0050         74         65         72         53         74         61         6e         64         17           0060         32         73         39         45         50         69         6e         7         50 |   | dA=<br>7fH.<br>3 Plotter<br>4 .42.259<br>e terStar<br>3 259EPir<br>5 tandarc<br>4 pipeplo | 0 gE.<br>                                | Profile: D                          | efault   |