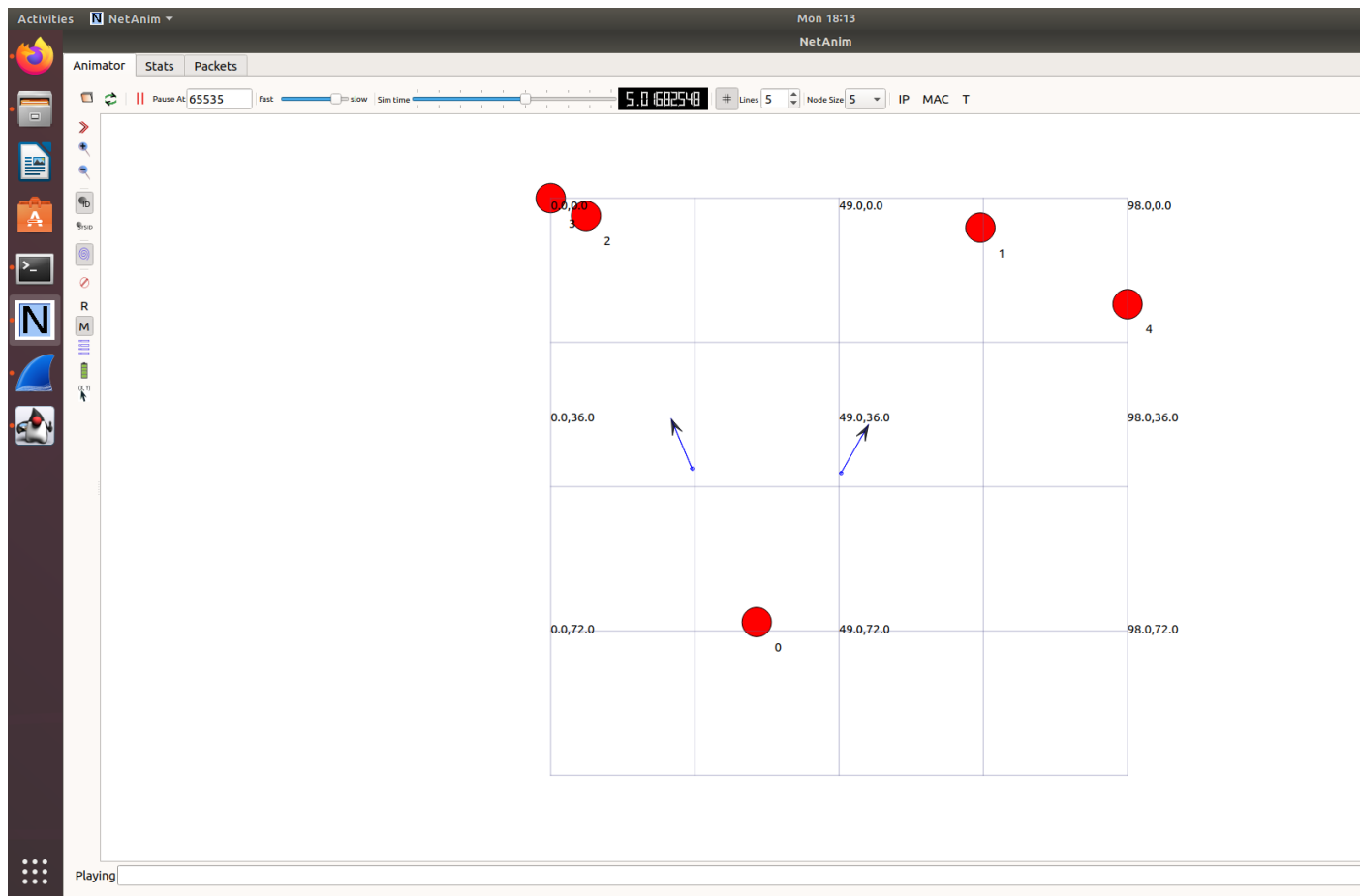


## NetAnim Output:



## TracMetrics Output:

The screenshot displays a Linux desktop environment with a terminal window and the TracMetrics GUI. The terminal shows the execution of the `tracemetrics.jar` file, resulting in a TCP size of 0. The TracMetrics GUI, titled "TracMetrics - a trace analyzer for Network Simulator 3", shows the "Simulation" tab selected. The "Details" section displays the following information:

File:	/home/ubuntu/ns-allinone-3.34/ns-3.34/casma-multicast.tr
Lines on file:	16
Total enqueued packets:	4
Total sent packets:	4
Total received packets:	8
Total dropped packets:	0
Total simulation time:	9.03593 seconds
Time of analysis:	0s

The "Nodes" tab is also visible, showing a list of nodes (0, 1, 2, 3, 4) and their respective statistics. The "Details" section for the selected node (0) shows the following information:

Node	0
Sent packets:	2
Received packets:	0
Dropped packets:	0
Data sent:	312.0 B
Data received:	0.0 B
Data dropped:	0.0 B
Throughput:	34.52881994437761 B
Goodput:	28.331339441540603 B
Lambda:	0.22133858938703596
EN:	0.0
EW:	0.0
Little's result:	
-> EN:	0.0
-> EW*lambda:	0.0
Average length of:	
-> Sent packets:	156.0 B
-> Received packets:	0.0 B

Buttons for "Export this" and "Export all" are visible at the bottom of the GUI.

TraceMetrics - a trace analyzer for Network Simulator 3

File Tools Help

Simulation Nodes **Throughput / Goodput** Little's Result Streams

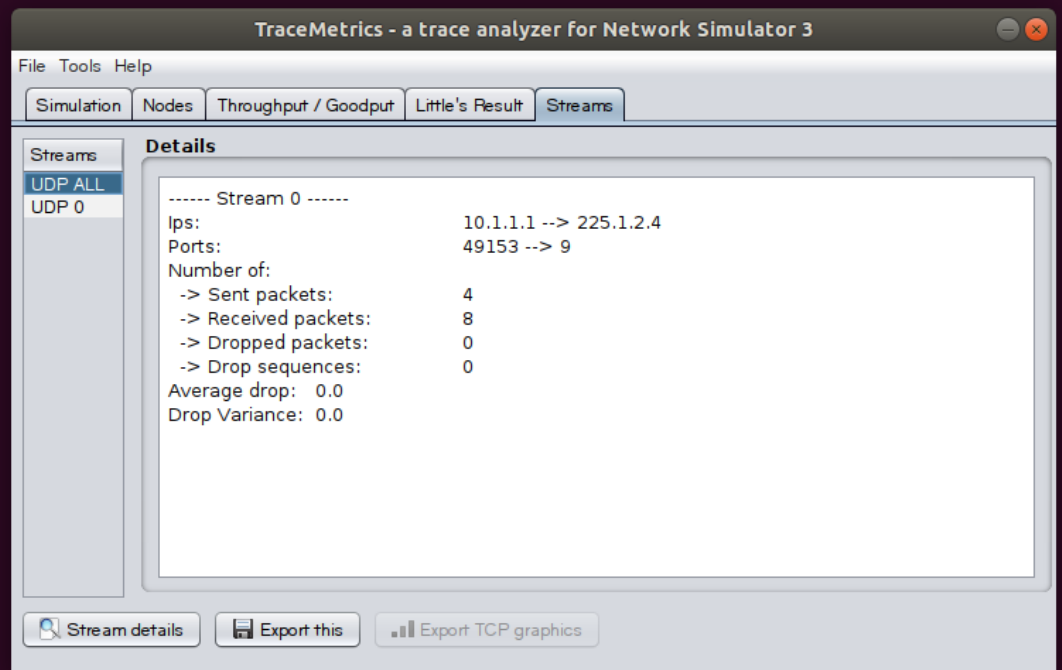
Node	Throughput	Goodput
0	34.52881994437761	28.331339441540603
1	0.0	0.0
2	34.52881994437761	28.331339441540603
3	0.0	0.0
4	0.0	0.0

TraceMetrics - a trace analyzer for Network Simulator 3

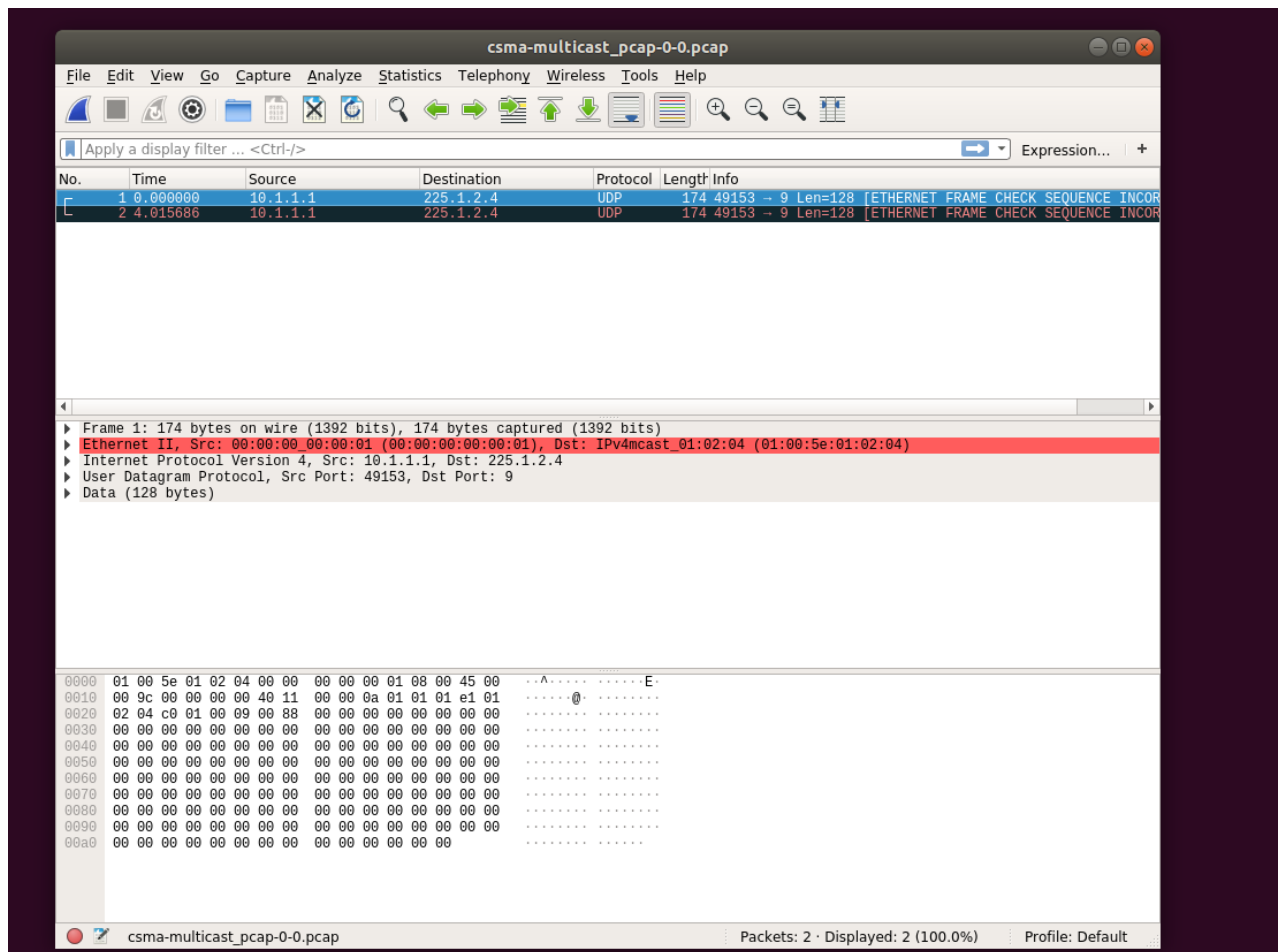
File Tools Help

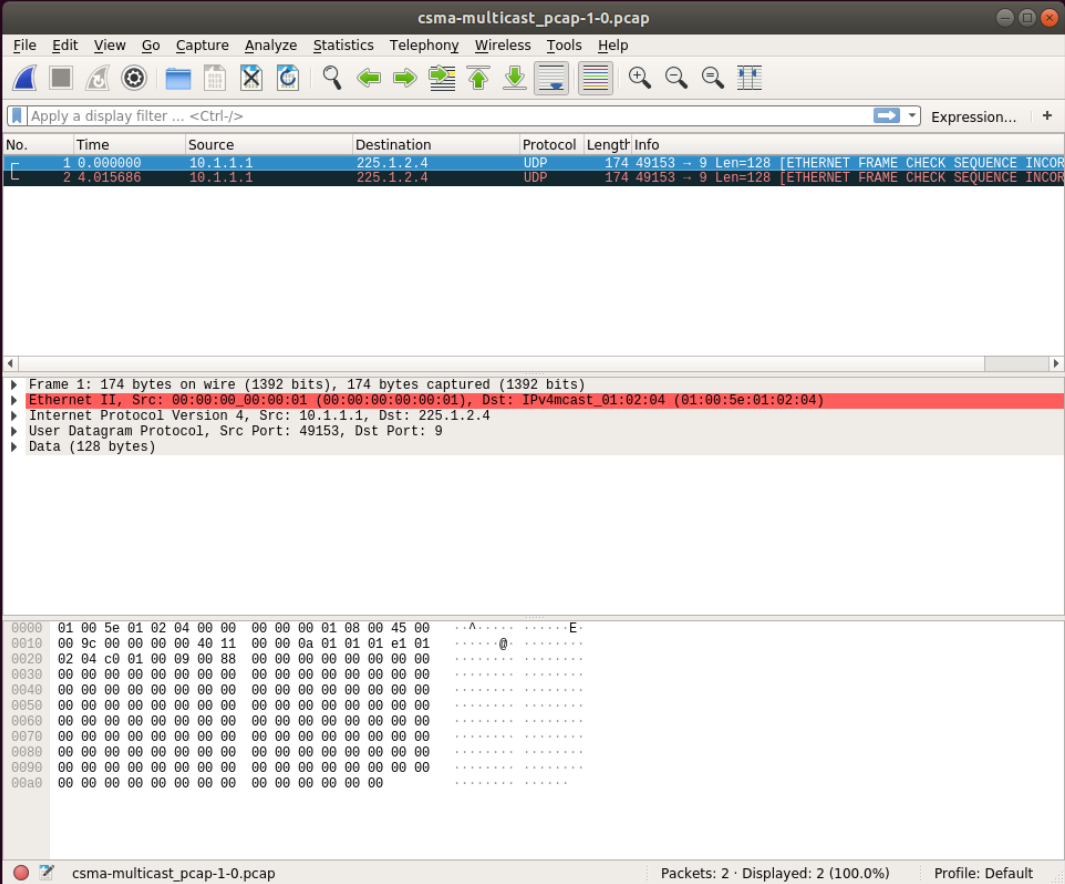
Simulation Nodes **Throughput / Goodput** Little's Result Streams

Node	Lambda	E[W]	E[N]	E[W] * Lambda
0	0.22133858938703596	0.0	0.0	0.0
1	0.0	0.0	0.0	0.0
2	0.22133858938703596	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0



## Wireshark Output:





The image shows a Wireshark packet capture analysis of a file named `csma-multicast_pcap-1-0.pcap`. The interface includes a menu bar (File, Edit, View, Go, Capture, Analyze, Statistics, Telephony, Wireless, Tools, Help) and a toolbar with various icons for file operations, capture, and analysis. A display filter bar at the top shows `Apply a display filter ... <Ctrl-/>` and an `Expression...` field.

The packet list pane displays two packets:

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	10.1.1.1	225.1.2.4	UDP	174	49153 → 9 Len=128 [ETHERNET FRAME CHECK SEQUENCE INCORRECT]
2	4.015686	10.1.1.1	225.1.2.4	UDP	174	49153 → 9 Len=128 [ETHERNET FRAME CHECK SEQUENCE INCORRECT]

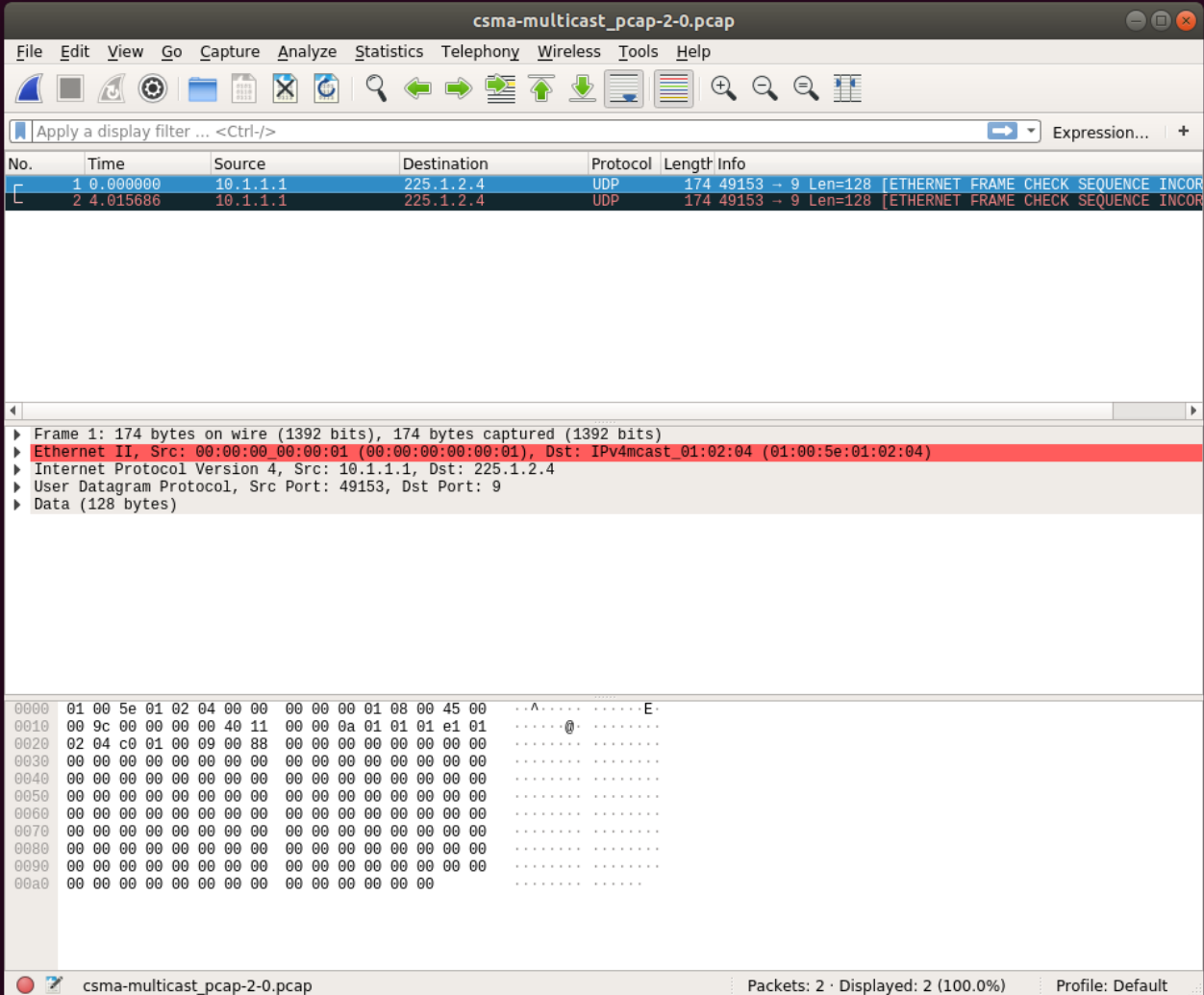
The packet details pane for the selected packet (Frame 1) shows the following structure:

- Frame 1: 174 bytes on wire (1392 bits), 174 bytes captured (1392 bits)
- Ethernet II, Src: 00:00:00:00:00:01 (00:00:00:00:00:01), Dst: IPv4mcast\_01:02:04 (01:00:5e:01:02:04)
- Internet Protocol Version 4, Src: 10.1.1.1, Dst: 225.1.2.4
- User Datagram Protocol, Src Port: 49153, Dst Port: 9
- Data (128 bytes)

The packet bytes pane displays the raw data in hexadecimal and ASCII format:

```
0000 01 00 5e 01 02 04 00 00 00 00 01 08 00 45 00  ..A.....E-
0010 00 0c 00 00 00 00 40 11 00 00 0a 01 01 01 e1 01  .....@.....
0020 02 04 c0 01 00 09 00 88 00 00 00 00 00 00 00 00  .....
0030 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
0040 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
0050 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
0060 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
0070 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
0080 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
0090 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
00a0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
```

The status bar at the bottom indicates: `csma-multicast_pcap-1-0.pcap`, `Packets: 2 · Displayed: 2 (100.0%)`, and `Profile: Default`.



The image shows a Wireshark packet capture analysis of a file named `csma-multicast_pcap-2-0.pcap`. The interface includes a menu bar (File, Edit, View, Go, Capture, Analyze, Statistics, Telephony, Wireless, Tools, Help), a toolbar with various icons, and a display filter bar showing `Apply a display filter ... <Ctrl-/>`.

The packet list pane displays two packets:

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	10.1.1.1	225.1.2.4	UDP	174	49153 → 9 Len=128 [ETHERNET FRAME CHECK SEQUENCE INCORRECT]
2	4.015686	10.1.1.1	225.1.2.4	UDP	174	49153 → 9 Len=128 [ETHERNET FRAME CHECK SEQUENCE INCORRECT]

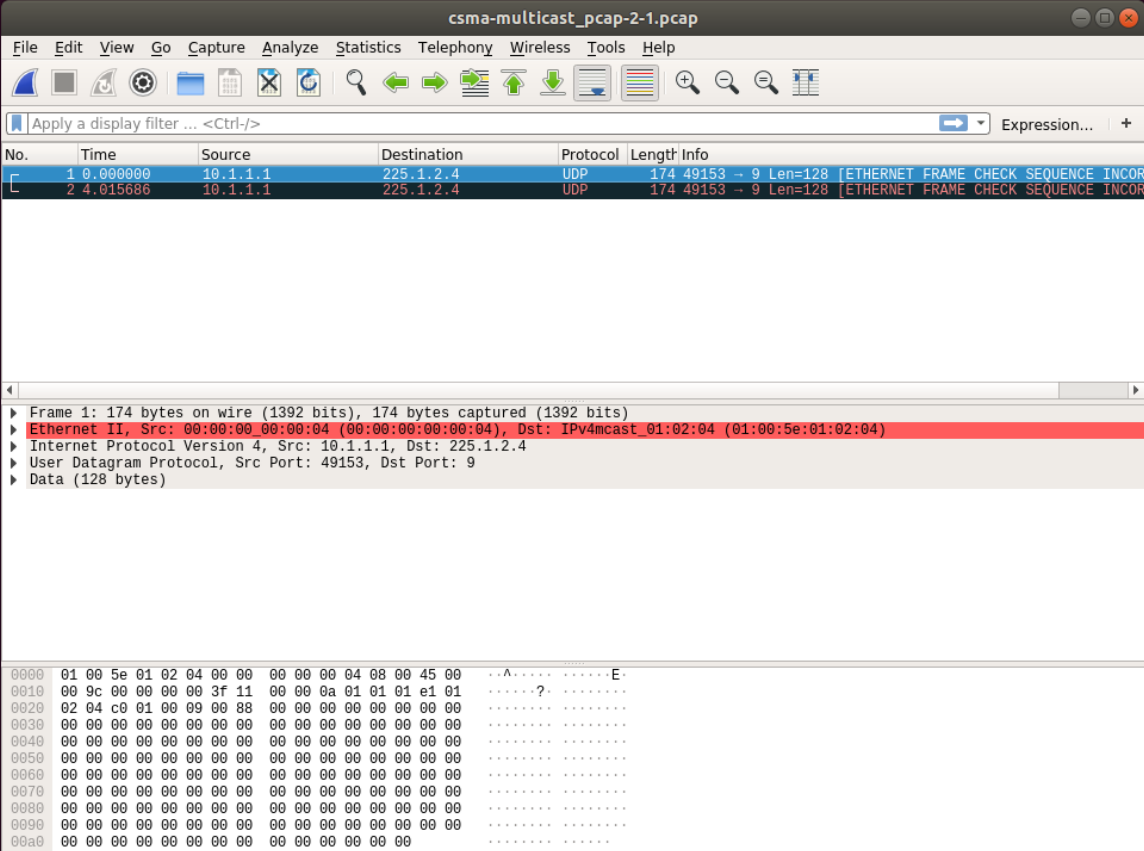
The packet details pane for the selected packet (Frame 1) shows the following structure:

- Frame 1: 174 bytes on wire (1392 bits), 174 bytes captured (1392 bits)
- Ethernet II, Src: 00:00:00:00:00:01 (00:00:00:00:00:01), Dst: IPv4mcast\_01:02:04 (01:00:5e:01:02:04)
- Internet Protocol Version 4, Src: 10.1.1.1, Dst: 225.1.2.4
- User Datagram Protocol, Src Port: 49153, Dst Port: 9
- Data (128 bytes)

The packet bytes pane displays the raw data in hexadecimal and ASCII format:

```
0000 01 00 5e 01 02 04 00 00 00 00 01 08 00 45 00  ..A.....E.
0010 00 9c 00 00 00 00 40 11 00 00 0a 01 01 01 e1 01  .....@.....
0020 02 04 c0 01 00 09 00 88 00 00 00 00 00 00 00 00  .....
0030 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
0040 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
0050 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
0060 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
0070 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
0080 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
0090 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
00a0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
```

The status bar at the bottom indicates: `csma-multicast_pcap-2-0.pcap`, `Packets: 2 · Displayed: 2 (100.0%)`, and `Profile: Default`.



The image shows a Wireshark packet capture analysis of a file named `csma-multicast_pcap-2-1.pcap`. The interface includes a menu bar (File, Edit, View, Go, Capture, Analyze, Statistics, Telephony, Wireless, Tools, Help) and a toolbar with various icons for file operations, capture control, and analysis.

The packet list pane at the top shows two captured packets:

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	10.1.1.1	225.1.2.4	UDP	174	49153 → 9 Len=128 [ETHERNET FRAME CHECK SEQUENCE INCORRECT]
2	4.015686	10.1.1.1	225.1.2.4	UDP	174	49153 → 9 Len=128 [ETHERNET FRAME CHECK SEQUENCE INCORRECT]

The packet details pane for the selected packet (Frame 1) shows the following structure:

- Frame 1: 174 bytes on wire (1392 bits), 174 bytes captured (1392 bits)
- Ethernet II, Src: 00:00:00:00:00:04 (00:00:00:00:00:04), Dst: IPv4mcast 01:02:04 (01:00:5e:01:02:04)
- Internet Protocol Version 4, Src: 10.1.1.1, Dst: 225.1.2.4
- User Datagram Protocol, Src Port: 49153, Dst Port: 9
- Data (128 bytes)

The packet bytes pane at the bottom displays the raw data in hexadecimal and ASCII. The first few bytes are:

```
0000 01 00 5e 01 02 04 00 00 00 00 04 08 00 45 00  ..^.....E-
0010 00 9c 00 00 00 00 00 3f 11 00 00 0a 01 01 01 e1 01  ....?.....
0020 02 04 c0 01 00 09 00 88 00 00 00 00 00 00 00 00  ....
0030 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ....
0040 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ....
0050 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ....
0060 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ....
0070 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ....
0080 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ....
0090 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ....
00a0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ....
```



The screenshot shows the Wireshark interface for the file `csma-multicast_pcap-3-0.pcap`. The packet list contains two entries:

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	10.1.1.1	225.1.2.4	UDP	174	49153 → 9 Len=128 [ETHERNET FRAME CHECK SEQUENCE INCORRECT]
2	4.015686	10.1.1.1	225.1.2.4	UDP	174	49153 → 9 Len=128 [ETHERNET FRAME CHECK SEQUENCE INCORRECT]

The packet details for the first packet (Frame 1) are expanded, showing:

- Ethernet II, Src: 00:00:00:00:00:04 (00:00:00:00:00:04), Dst: IPv4mcast\_01:02:04 (01:00:5e:01:02:04)
- Internet Protocol Version 4, Src: 10.1.1.1, Dst: 225.1.2.4
- User Datagram Protocol, Src Port: 49153, Dst Port: 9
- Data (128 bytes)

The packet bytes pane shows the raw data in hexadecimal and ASCII:

```
0000 01 00 5e 01 02 04 00 00 00 00 04 08 00 45 00  ..^.....E:
0010 00 0c 00 00 00 00 00 3f 11 00 00 0a 01 01 01 e1 01  ....?.....
0020 02 04 c0 01 00 09 00 88 00 00 00 00 00 00 00 00  ....
0030 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ....
0040 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ....
0050 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ....
0060 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ....
0070 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ....
0080 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ....
0090 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ....
00a0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ....
```

The screenshot shows the Wireshark interface for the file `csma-multicast_pcap-4-0.pcap`. The packet list contains two entries:

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	10.1.1.1	225.1.2.4	UDP	174	49153 → 9 Len=128 [ETHERNET FRAME CHECK SEQUENCE INCORRECT]
2	4.015686	10.1.1.1	225.1.2.4	UDP	174	49153 → 9 Len=128 [ETHERNET FRAME CHECK SEQUENCE INCORRECT]

The packet details for the first packet (Frame 1) are expanded, showing:

- Ethernet II, Src: 00:00:00:00:00:04 (00:00:00:00:00:04), Dst: IPv4mcast\_01:02:04 (01:00:5e:01:02:04)
- Internet Protocol Version 4, Src: 10.1.1.1, Dst: 225.1.2.4
- User Datagram Protocol, Src Port: 49153, Dst Port: 9
- Data (128 bytes)

The packet bytes pane shows the raw data in hexadecimal and ASCII:

```
0000 01 00 5e 01 02 04 00 00 00 00 04 08 00 45 00  ..^.....E:
0010 00 0c 00 00 00 00 00 3f 11 00 00 0a 01 01 01 e1 01  ....?.....
0020 02 04 c0 01 00 09 00 88 00 00 00 00 00 00 00 00  ....
0030 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ....
0040 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ....
0050 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ....
0060 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ....
0070 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ....
0080 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ....
0090 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ....
00a0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ....
```