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CS-GY 6843
Lab 3 – UDP

1. There are four UDP header fields: **Destination Port**, **Source Port**, **length** and **checksum**
2. Each header field is only two bytes long.
3. The value in the length field is the length of the UDP header and the UDP payload.
4. The maximum size of the UDP payload is 65527 bytes (the maximum number that can be represented by 16 bits is 65535, minus the size of the UDP headers, 8 bytes in total).
5. The largest possible source port number is 65535 (0xFFFF represented in decimal)
6. The protocol number for UDP is 0x11 or 17.
7. The port numbers for the two bidirectional packets are reversed, as in the second packet's destination port is the same as the first packet's source port, and vice versa for the second packet's source port.

Wireshark Trace with Annotation on next page

```

691 18.146632      172.16.25.111      239.255.255.250      SSDP      179      M-SEARCH * HTTP/1.1
Frame 691: 179 bytes on wire (1432 bits), 179 bytes captured (1432 bits) on interface 0
Interface id: 0 (\Device\NPF_{6853CBE4-78FA-4F49-A6B7-3D74C86A0839})
Interface name: \Device\NPF_{6853CBE4-78FA-4F49-A6B7-3D74C86A0839}
Encapsulation type: Ethernet (1)
Arrival Time: Feb 21, 2018 21:48:10.244593000 Eastern Standard Time
[Time shift for this packet: 0.000000000 seconds]
Epoch Time: 1519267690.244593000 seconds
[Time delta from previous captured frame: 0.191153000 seconds]
[Time delta from previous displayed frame: 2.589700000 seconds]
[Time since reference or first frame: 18.146632000 seconds]
Frame Number: 691
Frame Length: 179 bytes (1432 bits)
Capture Length: 179 bytes (1432 bits)
[Frame is marked: False]
[Frame is ignored: False]
[Protocols in frame: eth:ethertype:ip:udp:ssdp]
[Coloring Rule Name: UDP]
[Coloring Rule String: udp]
Ethernet II, Src: RivetNet_e1:f0:cf (9c:b6:d0:e1:f0:cf), Dst: IPv4mcast_7f:ff:fa (01:00:5e:7f:ff:fa)
Destination: IPv4mcast_7f:ff:fa (01:00:5e:7f:ff:fa)
Address: IPv4mcast_7f:ff:fa (01:00:5e:7f:ff:fa)
.... 0. .... = LG bit: Globally unique address (factory default)
.... 1. .... = IG bit: Group address (multicast/broadcast)
Source: RivetNet_e1:f0:cf (9c:b6:d0:e1:f0:cf)
Address: RivetNet_e1:f0:cf (9c:b6:d0:e1:f0:cf)
.... 0. .... = LG bit: Globally unique address (factory default)
.... 0. .... = IG bit: Individual address (unicast)
Type: IPv4 (0x0800)
Internet Protocol Version 4, Src: 172.16.25.111, Dst: 239.255.255.250
0100 .... = Version: 4
.... 0101 = Header Length: 20 bytes (5)
Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
0000 00.. = Differentiated Services Codepoint: Default (0)
.... 00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)
Total Length: 165
Identification: 0x64ee (25838)
Flags: 0x00
0... .... = Reserved bit: Not set
.0... .... = Don't fragment: Not set
..0. .... = More fragments: Not set
Fragment offset: 0
Time to live: 4
Protocol: UDP (17)  UDP Protocol Number 17 (0x11)
Header checksum: 0x9be0 [validation disabled]
[Header checksum status: Unverified]
Source: 172.16.25.111
Destination: 239.255.255.250
[Source GeoIP: Unknown]
[Destination GeoIP: Unknown]
User Datagram Protocol, Src Port: 53915, Dst Port: 1900
Source Port: 53915
Destination Port: 1900
Length: 145
Checksum: 0x7d2c [unverified]
[Checksum Status: Unverified]
[Stream index: 3]
Simple Service Discovery Protocol
M-SEARCH * HTTP/1.1\r\n
[Expert Info (Chat/Sequence): M-SEARCH * HTTP/1.1\r\n]
[M-SEARCH * HTTP/1.1\r\n]
[Severity level: Chat]
[Group: Sequence]
Request Method: M-SEARCH
Request URI: *
Request Version: HTTP/1.1
Host: 239.255.255.250:1900\r\n
ST: urn:schemas-upnp-org:device:InternetGatewayDevice:1\r\n
Man: "ssdp:discover"\r\n
MX: 3\r\n
\r\n
[Full request URI: http://239.255.255.250:1900*]
[HTTP request 2/6]
[Prev request in frame: 566]
[Next request in frame: 833]
0000 01 00 5e 7f ff fa 9c b6 d0 e1 f0 cf 08 00 45 00 ..^.....E.
0010 00 a5 64 ee 00 00 04 11 9b e0 ac 10 19 6f ef ff ..d.....o..
0020 ff fa d2 9b 07 6c 00 91 7d 2c 4d 2d 53 45 41 52 .....l..},M-SEAR
0030 43 48 20 2a 20 48 54 54 50 2f 31 2e 31 0d 0a 48 CH * HTTP/1.1..H
0040 6f 73 74 3a 20 32 33 39 2e 32 35 35 2e 32 35 35 ost: 239.255.255
0050 2e 32 35 30 3a 31 39 30 30 0d 0a 53 54 3a 20 75 .250:1900..ST: u

```

Four UDP header fields

four 2 byte UDP header fields
in the byte representation of
the request

```
0060 72 6e 3a 73 63 68 65 6d 61 73 2d 75 70 6e 70 2d
0070 6f 72 67 3a 64 65 76 69 63 65 3a 49 6e 74 65 72
0080 6e 65 74 47 61 74 65 77 61 79 44 65 76 69 63 65
0090 3a 31 0d 0a 4d 61 6e 3a 20 22 73 73 64 70 3a 64
00a0 69 73 63 6f 76 65 72 22 0d 0a 4d 58 3a 20 33 0d
00b0 0a 0d 0a
```

```
rn:schemas-upnp-
org:device:Inter
netGatewayDevice
:l..Man: "ssdp:d
iscover"•.MX: 3.
```

Payload length of 137 bytes, total length =
137 + 8