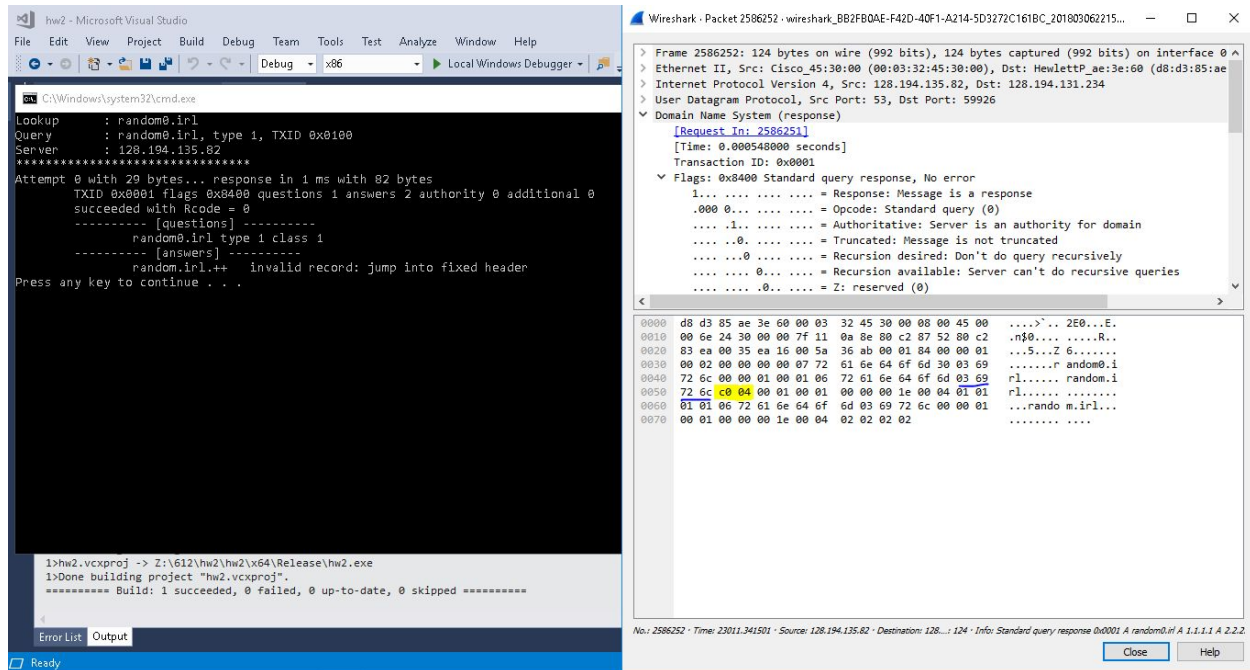CSCE 612: Networks & Distributed Processing
HW2 Report
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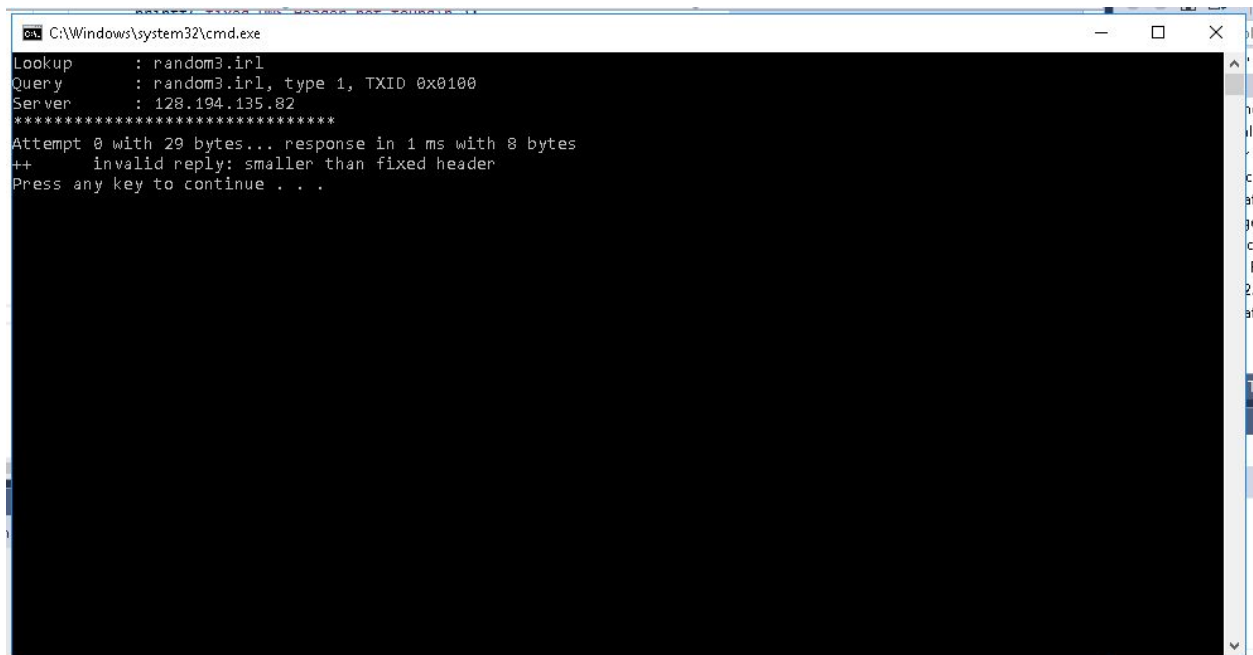

Case 1:

random0.irl: ++ invalid record: jump into fixed header

This case doesn't seem to be exhibiting any errors in wireshark. However, when closely looked into it can be observed that, the first answer random.irl is not followed by 0 indicating the end of name but instead ended with 0xc0. This could be the potential error, when it jumps and lands inside the fixed header space.
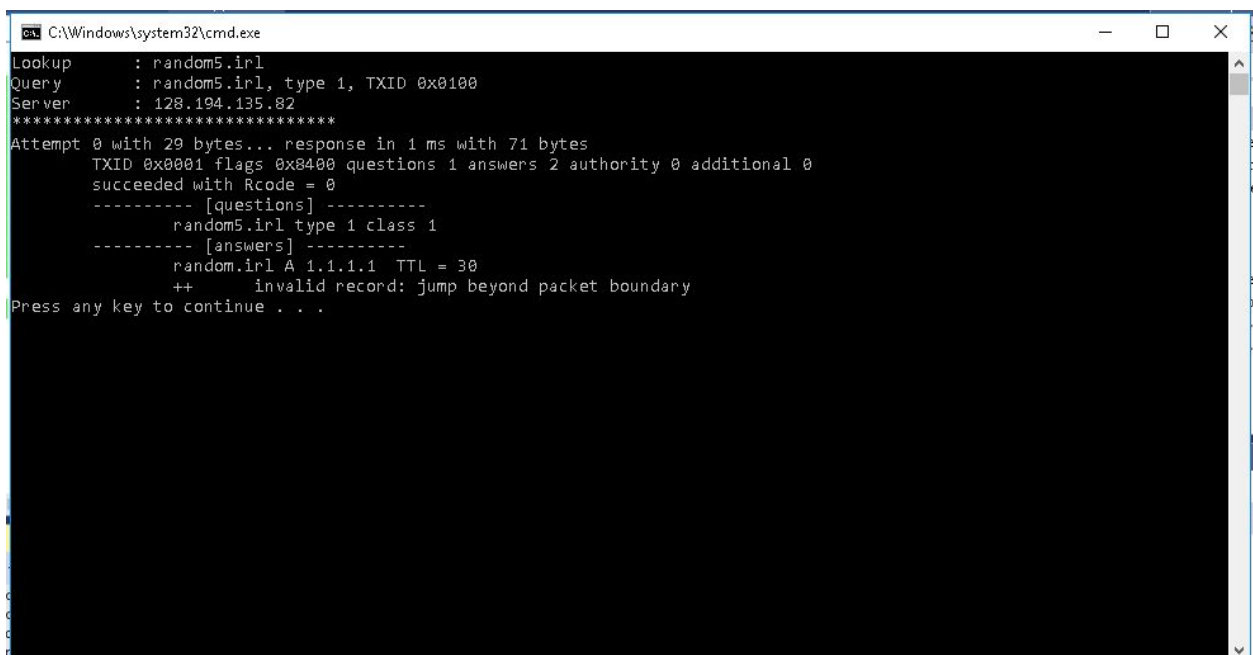
random3.irl: ++ invalid record: smaller than fixed header


```
C:\Windows\system32\cmd.exe                                        —   □   ✕
Lookup      : random3.irl
Query       : random3.irl, type 1, TXID 0x0100
Server      : 128.194.135.82
*******************************
Attempt 0 with 29 bytes... response in 1 ms with 8 bytes
++      invalid reply: smaller than fixed header
Press any key to continue . . .
```

random5.irl: ++ invalid record: jump beyond packet boundary


```
C:\Windows\system32\cmd.exe                                        —   □   ✕
Lookup      : random5.irl
Query       : random5.irl, type 1, TXID 0x0100
Server      : 128.194.135.82
*******************************
Attempt 0 with 29 bytes... response in 1 ms with 71 bytes
        TXID 0x0001 flags 0x8400 questions 1 answers 2 authority 0 additional 0
        succeeded with Rcode = 0
        ---------- [questions] ----------
                random5.irl type 1 class 1
        ---------- [answers] ----------
                random.irl A 1.1.1.1  TTL = 30
        ++      invalid record: jump beyond packet boundary
Press any key to continue . . .
```

random6.irl: ++ invalid record: jump loop


```
C:\Windows\system32\cmd.exe                                    —    □    ×

Lookup      : random6.irl
Query       : random6.irl, type 1, TXID 0x0100
Server      : 128.194.135.82
*********************************
Attempt 0 with 29 bytes... response in 1 ms with 59 bytes
        TXID 0x0001 flags 0x8400 questions 1 answers 2 authority 0 additional 0
        succeeded with Rcode = 0
        ---------- [questions] ----------
              random6.irl type 1 class 1
        ---------- [answers] ----------
              random6.irl CNAME ++    invalid record: jump loop
Press any key to continue . . .
```

Case 2:

random1.irl: ++ invalid section: not enough records

```
C:\Windows\system32\cmd.exe                                              —    □    ✕
Lookup       : random1.irl
Query        : random1.irl, type 1, TXID 0x0100
Server       : 128.194.135.82
********************************
Attempt 0 with 29 bytes... response in 1 ms with 468 bytes
        TXID 0x0001 flags 0x8600 questions 1 answers 1 authority 0 additional 65535
        succeeded with Rcode = 0
        ---------- [questions] ----------
                random1.irl type 1 class 1
        ---------- [answers] ----------
                random.irl A 1.1.1.1  TTL = 30
        ---------- [additional] ----------
                Episode.IV A 2.2.2.2  TTL = 30
                A.NEW.HOPE A 2.2.2.2  TTL = 30
                It.is.a.period.of.civil.war A 2.2.2.2  TTL = 30
                Rebel.spaceships A 2.2.2.2  TTL = 30
                striking.from.a.hidden.base A 2.2.2.2  TTL = 30
                have.won.their.first.victory A 2.2.2.2  TTL = 30
                against.the.evil.Galactic.Empire A 2.2.2.2  TTL = 30
                During.the.battle A 2.2.2.2  TTL = 30
                Rebel.spies.managed A 2.2.2.2  TTL = 30
                to.steal.secret.plans A 2.2.2.2  TTL = 30
                to.the.Empires.ultimate.weapon A 2.2.2.2  TTL = 30
                ++      invalid section: not enough records
Press any key to continue . . .
```

Case 3:

random7.irl: ++ invalid record: truncated jump offset

```
C:\Windows\system32\cmd.exe                                              —    □    ✕
Lookup       : random7.irl
Query        : random7.irl, type 1, TXID 0x0100
Server       : 128.194.135.82
********************************
Attempt 0 with 29 bytes... response in 0 ms with 42 bytes
        TXID 0x0001 flags 0x8400 questions 1 answers 2 authority 0 additional 0
        succeeded with Rcode = 0
        ---------- [questions] ----------
                random7.irl type 1 class 1
        ---------- [answers] ----------
                random7.irl CNAME ++    invalid record: truncated jump offset
Press any key to continue . . .
```
Show output from: Build

Case 4:

random4.irl:
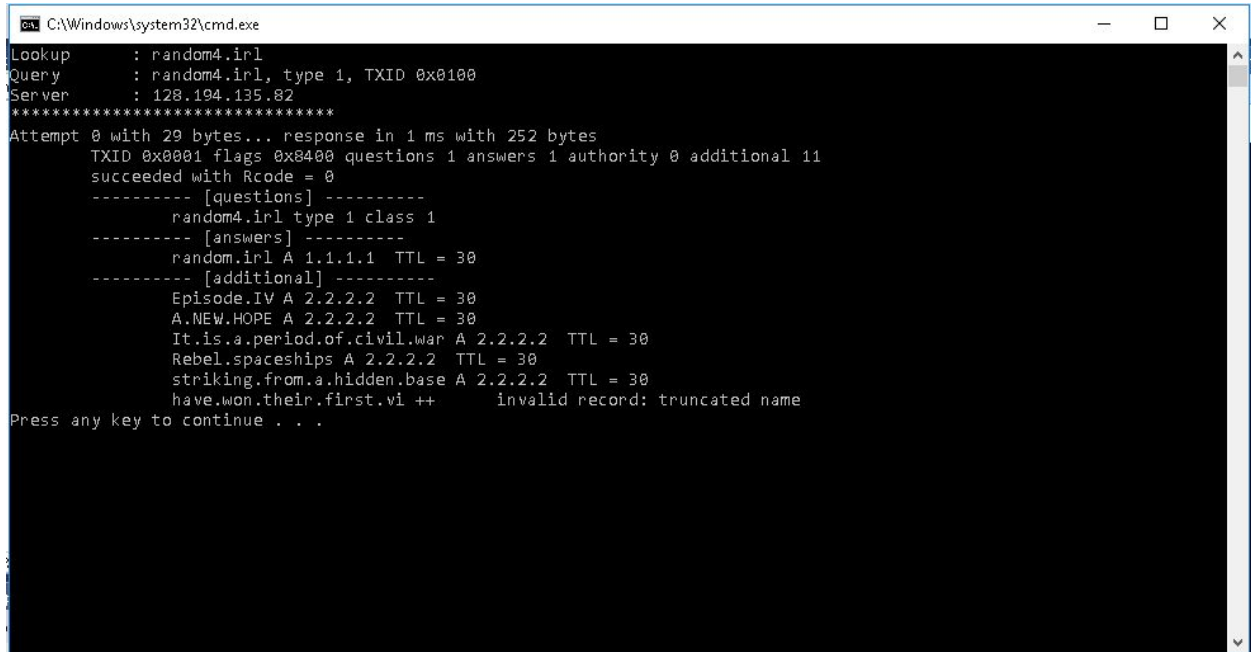
++ invalid record: truncated fixed RR header

Solution: After record name is printed, before typecasting the following buf into a FixedRR type, it has been checked if (currptr location relative to received buffer + sizeof(FixedRR)) is greater that no of bytes received or not. If greater it means the RR header has been truncated.

++ invalid record: RR value length beyond packet

Solution: Once the record name is printed, and the fixedRR header is obtained. While printing the type, it has been checked if the integer value of the u_short length obtained in the fixedRR header buffer i.e., ((int)htons(frr->length) + currptr location relative to received buffer) is greater that no of bytes received or not. If greater it means the RR header has been truncated.

++ invalid record: truncated name

Solution: While record name is printed, and when the size of the string n,str_n is come across, it is checked if After record name is printed, before typecasting the following buf into a FixedRR type, it has been checked if (currptr location relative to received buffer + str_n size) is greater that no of bytes received or not. If greater it means the RR header has been truncated.